

[Abstract:0004]

## EFFECT OF ANTIHYPERTENSIVE, ANTI-DIABETIC, AND HYPOLIPIDEMIC TREATMENT ON PROGRESSION OF RENAL DYSFUNCTION IN PATIENTS WITH RESISTANT AND NON-RESISTANT ARTERIAL HYPERTENSION

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**Summary and Purpose:** Apparently treatment-resistant hypertension (ATRH) is associated with faster deterioration of renal function compared to non-resistant hypertension (NAH). The study aimed to assess the effect of antihypertensive, anti-diabetic, and hypolipidemic agents and identify medication possibly associated with a faster decline of renal function during long-term follow-up.

**Methods:** Data from patients in a Hypertension Excellence Centre were retrospectively evaluated. Patients in both groups were divided into subgroups with faster deterioration of renal function (eGFR decrease >-1.0 mL/s/1.73m<sup>2</sup>/year), and slower deterioration (eGFR decrease <-1.0 mL/s/1.73m<sup>2</sup>/year). Statistical evaluation of basic demographic parameters, clinical findings and medication was performed. Holm-Bonferroni correction was used to eliminate type I error.

**Findings:** 137 patients had ATRH, and 128 patients had NAH. Patients were followed-up for a mean of 6.4 years. Patients with ATRH were prescribed a mean of 4.9 antihypertensive agents, and patients with NAH had a mean of 2 agents (P<0.001). eGFR slope decline was 2.3-fold faster in ATRH group in comparison to NAH group (P=0.005). In ATRH group, 62 patients had faster deterioration of renal function and in NAH group 79 patients had faster decline of renal function. No specific drug group was associated with faster deterioration of renal function between the groups.

**Conclusions:** Commonly prescribed antihypertensive, anti-diabetic, and hypolipidemic treatment regarding renal function appeared to be safe in this small cohort of patients. Large-prospective studies are needed for further evaluation.

**Keywords:** Resistant arterial hypertension, chronic kidney disease, antihypertensive agents, anti-diabetic agents, hypolipidemic agents

	Resistant hypertension			Non-resistant hypertension		
	Cut-off eGFR: 1 mL/min/1.73m <sup>2</sup>	Slower decline of eGFR	Faster decline of eGFR	P (group 1 vs. 2)	Slower decline of eGFR	Faster decline of eGFR
	N = 62	N = 75		N = 79	N = 49	
No. of antihypertensive drugs	4.7 ± 1.1	5.1 ± 0.9	NS	2.1 ± 0.8	2.0 ± 0.9	NS
ACEi	24 (38.7 %)	25 (33.3 %)	NS	30 (38.0 %)	19 (38.8 %)	NS
ARBs	39 (62.9 %)	49 (65.3 %)	NS	33 (41.8 %)	19 (38.8 %)	NS
Calcium channel blockers	47 (75.8 %)	60 (80.0 %)	NS	32 (40.5 %)	18 (36.7 %)	NS
Betablockers	49 (79.0 %)	64 (85.3 %)	NS	30 (38.0 %)	20 (40.8 %)	NS
Diuretics	61 (98.4 %)	73 (97.3 %)	NS	35 (44.3 %)	22 (44.9 %)	NS
Potassium-sparing diuretics	36 (58.0 %)	58 (77.3 %)	NS	3 (3.8 %)	4 (8.2 %)	NS
Spirolactone/ Eplerenone	21 (33.9 %)	42 (56.0 %)	NS	3 (3.8 %)	4 (8.2 %)	NS
Amiloride	15 (24.2 %)	16 (21.3 %)	NS	0 (0.0 %)	0 (0.0 %)	-
Loop-acting diuretics	5 (8.1 %)	9 (12.0 %)	NS	1 (1.3 %)	2 (4.1 %)	NS
Thiazide and thiazide like diuretics	60 (96.8 %)	70 (93.3 %)	NS	32 (40.5 %)	18 (36.7 %)	NS
Indapamide	24 (38.7 %)	30 (40.0 %)	NS	20 (25.3 %)	10 (20.4 %)	NS
Hydrochlorothiazide/ chlorthalidone	36 (58.0 %)	40 (57.1 %)	NS	12 (15.2 %)	8 (16.3 %)	NS
Alpha blockers	18 (29.0 %)	27 (36.0 %)	NS	1 (1.3 %)	0 (0.0 %)	NS
Centrally acting antihypertensives	8 (12.9 %)	8 (10.7 %)	NS	3 (3.8 %)	2 (4.1 %)	NS
Statins	43 (69.4 %)	47 (62.7 %)	NS	23 (29.1 %)	17 (34.7 %)	NS
Fibrates	3 (4.8 %)	4 (5.3 %)	NS	0 (0.0 %)	0 (0.0 %)	-
Ezetimibe	3 (4.8 %)	3 (4.0 %)	NS	1 (1.3 %)	1 (2.0 %)	NS
Insulin	2 (3.2 %)	15 (20.0 %)	NS	0 (0.0 %)	1 (2.0 %)	NS
Metformin	12 (19.4 %)	19 (25.3 %)	NS	1 (1.3 %)	3 (6.1 %)	NS
Sulfonylurea derivatives	3 (4.8 %)	8 (10.7 %)	NS	1 (1.3 %)	1 (2.0 %)	NS
DPP-4 inhibitors	4 (6.5 %)	7 (9.3 %)	NS	0 (0.0 %)	2 (4.1 %)	NS
SGLT2 inhibitors	0 (0.0 %)	4 (5.3 %)	NS	0 (0.0 %)	0 (0.0 %)	-
GLP-1 agonists	0 (0.0 %)	1 (1.3 %)	NS	0 (0.0 %)	0 (0.0 %)	-
Thiazolidinediones	0 (0.0 %)	1 (1.3 %)	NS	0 (0.0 %)	0 (0.0 %)	-

**Table 1.** Medication in subgroups according to the progression of renal function.

[Abstract:0051]

## CORONARY MICROVASCULAR DYSFUNCTION IN PATIENTS WITH NON-OBSTRUCTIVE CORONARY ARTERY DISEASE: A HARBINGER OF ADVERSE EVENTS

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**Aim:** To evaluate the comprehensive characteristics of coronary microvascular dysfunction (CMD) and to assess its prognostic value during 12-month follow-up period.

**Methods:** A total of 118 patients with non-obstructive CAD and preserved LVEF were enrolled (Fig. 1). Serum levels of biomarkers were analyzed by ELISA. Evaluation of LV diastolic dysfunction (DD) and global longitudinal strain (GLS) were performed baseline. CMD was defined as the myocardial flow reserve (MFR)  $\leq 2$  evaluated by dynamic CZT-SPECT.

**Results:** Patients were divided into groups depending on the presence of CMD: group 1 (n=45) comprised patients with CMD, and group 2 (n=73) included patients without CMD (Table 1). The value of GLS was lower by 29.7% ( $p=0.005$ ), and the incidence and severity of DD was higher in patients with CMD (Table 2). In group 1, MFR values were lower by 48.3% ( $p<0.001$ ) than in group 2 (Fig. 2). The levels of the biomarkers of fibrosis, endothelial dysfunction and inflammation were higher in patients with CMD. During the 12 months of follow-up, 25 patients had the adverse outcomes (Fig. 3). The incidence of adverse events preponderated in patients with CMD than in patients without it (Fig. 4). The levels of MFR  $\leq 1.62$  and NT-proBNP  $\geq 760.5$  pg/mL were identified as cut-off values to predict adverse outcomes (Fig. 5).

**Conclusions:** CMD was associated with severe DD, subtle LV systolic function impairment, and overexpression of the biomarkers of fibrosis, endothelial dysfunction, and inflammation. The incidence of adverse events preponderated in patients with CMD than in patients without it.

**Keywords:** Coronary microvascular dysfunction, adverse outcomes, endothelial dysfunction, inflammation, fibrosis, non-obstructive coronary artery disease

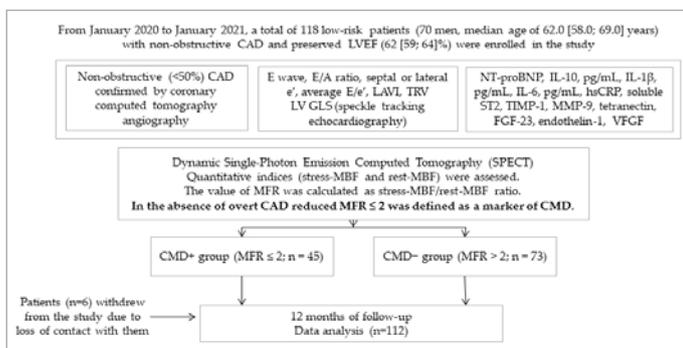


Figure 1. Study design.

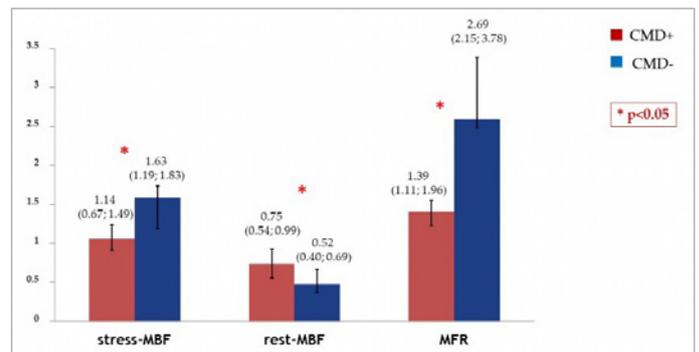


Figure 2. Dynamic SPECT parameters.

Notes. MBF - myocardial blood flow; MFR - myocardial flow reserve.

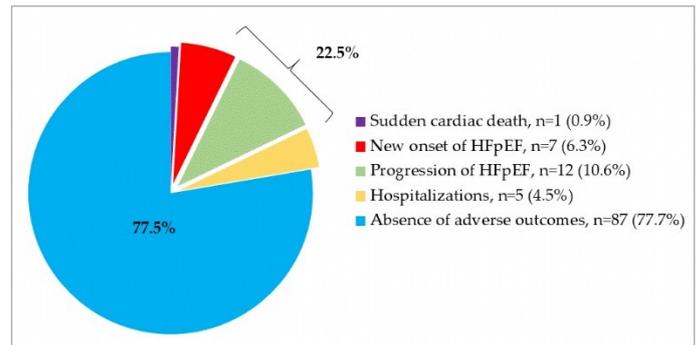


Figure 3. The adverse outcomes registered during 12 months of follow-up period.

Notes. HFpEF - heart failure with preserved ejection fraction.

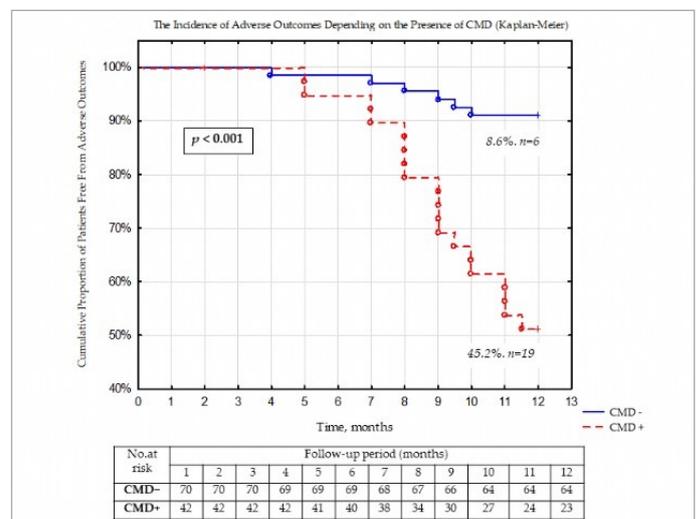
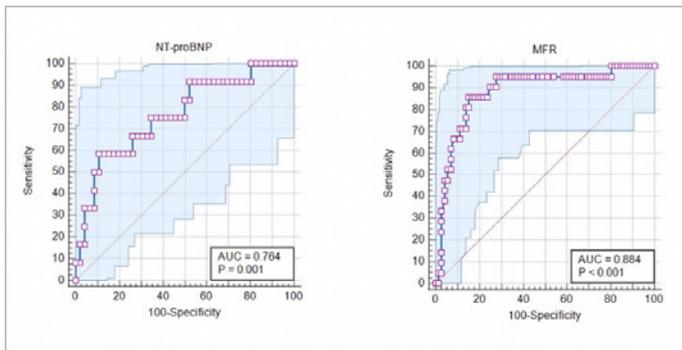


Figure 4. The rate of adverse outcomes during 12 months of follow-up period depending on the presence of coronary microvascular dysfunction (Kaplan-Meier analysis).



**Figure 5.** The ROC-curves of NT-proBNP and MFR values in the risk stratification of adverse events.

Notes. NT-proBNP—N-terminal pro-B-type natriuretic peptide; MFR—myocardial flow reserve

Parameter	CMD+ n = 42	CMD- n = 70	p-Value
Age, years	61 (56; 68.5)	61.5 (59; 67.5)	0.123
Male sex, n (%)	26 (61.9)	44 (62.8)	0.901
Body mass index, kg/sq.m.	29.9 (27.8; 31.9)	30.2 (27.9; 32.1)	0.276
Hypertension, n (%)	37 (88.1)	43 (61.4)	0.069
Type 2 diabetes mellitus, n (%)	11 (26.2)	5 (7.1)	0.007
History of COVID-19-19, n (%)	7 (16.7)	12 (17.1)	0.318
COPD, n (%)	7 (16.7)	13 (18.6)	0.723
Paroxysmal AF, n (%)	7 (16.7)	11 (15.7)	0.769
HFpEF, n (%)	34 (80.9)	24 (34.3)	<0.001
Smokers, n (%)	11 (26.2)	5 (5.7)	0.009
NT-proBNP, pg/mL	404.2 (249.5; 1533.4)	156.3 (135.26; 274.7)	0.004
eGFR (mL/min/1.73 sq.m.)	77.2 (63.2; 81.2)	77.0 (64.0; 85.0)	0.543
Total cholesterol, mmol/L	4.635 (3.67; 5.25)	4.33 (3.54; 4.98)	0.898
LDL-C, mmol/L	3.12 (2.15; 3.51)	2.87 (2.25; 3.87)	0.456
HDL-C, mmol/L	1.05 (0.83; 1.32)	1.05 (0.96; 1.26)	0.887
Triglyceride, mmol/L	1.67 (1.23; 1.89)	1.59 (1.22; 1.86)	0.835

**Table 1.** Baseline Clinical and Demographic Characteristics of Patients.

Notes. E/A—the ratio of the maximum blood flow rate in the phase of rapid filling to the maximum flow rate in atrial systole; E/e'—the ratio of the transmitral E peak to the tissue myocardial Doppler e'; LVMMi—left ventricular myocardial mass index; LAVI—left atrial volume indexed; TRV—tricuspid regurgitation peak velocity; lateral e'—early diastolic velocity of the lateral wall of the left ventricle.

Parameter	CMD+ n = 47	CMD- n = 73	p-Value
Left ventricle ejection fraction, %	62 (58.5; 65.0)	63 (61; 66)	0.183
End-systolic dimension, mm	40 (38; 43)	38.5 (36.5; 41.5)	0.524
End-diastolic dimension, mm	51.0 (48.7; 53.0)	50.5 (47.5; 52.5)	0.307
LVMMi, g/sq.m.	98.0 (88.5; 114.5)	92 (85.5; 106.5)	0.276
E/A ratio	1.04 (0.79; 1.3)	0.97 (0.74; 1.2)	0.516
Lateral e', sm/sec	5.56 (4.78; 6.45)	8.56 (8.01; 9.14)	0.009
TRV, m/s	2.99 (2.95; 3.01)	2.63 (2.3; 2.76)	0.011
E/e' ratio	14 (13.5; 15.0)	11 (10; 12)	0.041
LAVI, mL/q.m.	38.3 (35.7; 51.1)	29.7 (27.5; 47.9)	0.038
LV global longitudinal strain, %	-14.7 (-12.9; -16.9)	-20.9 (16.1; 21.6)	0.005
Diastolic dysfunction, n (%)	37 (88.1)	26 (37.1)	<0.001

**Table 2.** Baseline echocardiographic parameters

Notes. E/A—the ratio of the maximum blood flow rate in the phase of rapid filling to the maximum flow rate in atrial systole; E/e'—the ratio of the transmitral E peak to the tissue myocardial Doppler e'; LVMMi—left ventricular myocardial mass index; LAVI—left atrial volume indexed; TRV—tricuspid regurgitation peak velocity; lateral e'—early diastolic velocity of the lateral wall of the left ventricle.

[Abstract:0058]

## POST-PROCEDURAL FEVER AFTER TRANSCATHETER AORTIC VALVE IMPLANTATION (TAVI): A RETROSPECTIVE REAL-WORLD SINGLE-CENTRE STUDY

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**Background:** The pathogenesis, prevalence and outcome of fever occurring during the first 72 after transcatheter aortic valve implantation (TAVI) are not well understood. In particular, it is not clear if it is the consequence of a systemic inflammatory response syndrome (SIRS) or an infectious phenomenon. We report our experience in a high-volume center.

**Methods:** We retrospectively enrolled 483 consecutive patients approved for TAVI by the Heart-Team of our hospital between December 2018 and July 2022. Data retrieved from electronic hospital charts included demographics, comorbidities assessed by Charlson's Comorbidity Index (CCI), NYHA functional class, Multidimensional Prognostic Index (MPI), EUROSCORE II and STS mortality score, pre- and post-procedural echocardiographic data, and procedural details. Fever was defined as temperature > 37.5°C.

**Results:** The prevalence of fever post TAVI was 28% and, in most cases, (76%) without documented infection. Most febrile episodes occurred within 48 hours after the procedure and were short in duration (lasting less than 1 day). The occurrence of fever was associated with interventricular septum thickness, pre-procedural anaemia, and the persistence more than 1 day of a central venous catheter or a delivery sheath. We observed a significant increase of CRP (C Reactive Protein) in patient with fever. We did not find differences in mortality and incidence of infective endocarditis in patients with or without fever.

**Conclusions:** Fever after TAVI is common and mostly sustained by a non-infectious inflammatory response. A watchful waiting strategy in an otherwise stable TAVI patient with a brief and isolated fever measurement could be reasonable.

**Keywords:** fever, mortality, TAVI

[Abstract:0066]

## VENTRICULAR FIBRILLATION DURING FOOTBALL TRAINING AS A CONSEQUENCE OF KRATOM AND CAFFEINE USE IN AN ADOLESCENT: CASE REPORT

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**Background:** There is an increase in the sale of legal drugs in the Czech Republic. One of these substances is kratom. Kratom (*Mitragyna speciosa*) is a partial agonist of the opioid kappa, mu, and delta receptors. It acts as a stimulant at low concentrations, making users feel more energetic and euphoric. It has sedative and antinociceptive effects at higher doses. Case summary: An 18-year-old man collapsed during football training and required cardiopulmonary resuscitated; the initial rhythm was ventricular fibrillation managed by defibrillation.

Laboratory parameters were unremarkable. Blood samples sent for toxicological evaluation were positive for kratom and caffeine. Other investigations showed no explanatory aetiology. Genetic testing did not find a pathogenic gene variant associated with familial ventricular fibrillation, but a variant of unknown significance was found in MYOM1. A cardioverter-defibrillator was implanted in the patient.

**Discussion:** In the Czech Republic, kratom is freely available and sold as a plant, not a drug. Sellers state on their labels that it is a substance sold "for collectors' purposes only." Only incident cases of ventricular fibrillation after kratom use are described in the literature. There is insufficient scientific evidence linking kratom to ventricular fibrillation. No recurrence of ventricular arrhythmia has been reported by ambulatory cardioverter-defibrillator memory checks on our patient. Therefore, the development of ventricular fibrillation was assumed to be due to a combination of kratom, caffeine, and exercise.

**Keywords:** Kratom, *Mitragyna speciosa*, Ventricular fibrillation, Implantable cardioverter - defibrillator, MYOM1

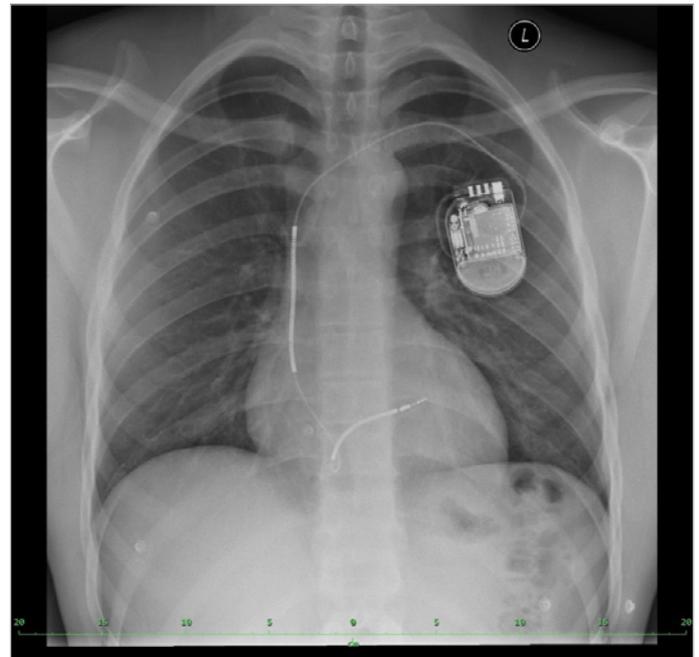


Figure 1. Chest x-ray.

A, Upon arrival at the hospital, supine Figure. B, After implantation of the cardioverter defibrillator.

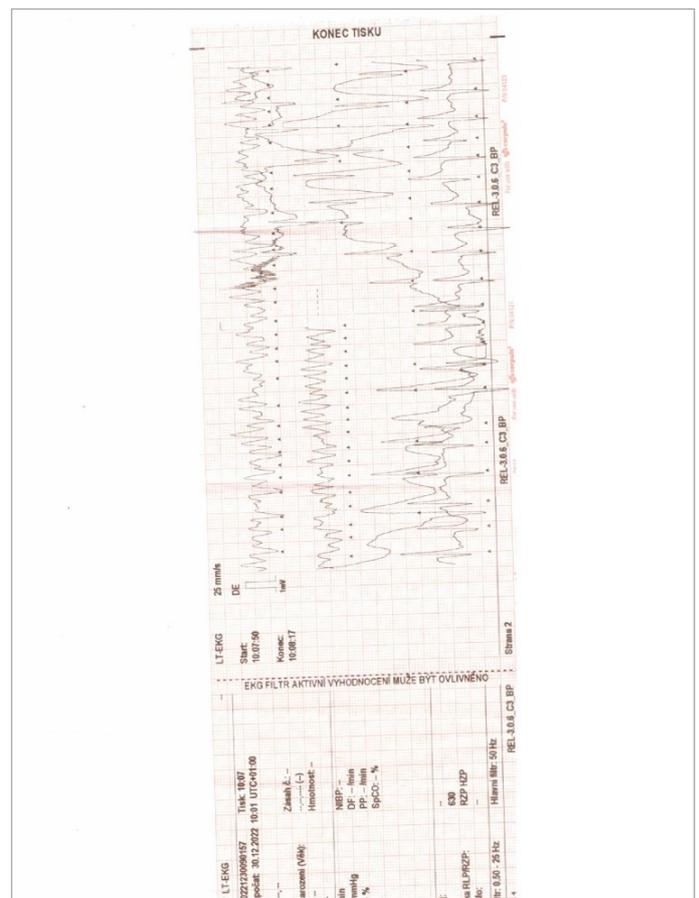


Figure 2. Echocardiographic examination.

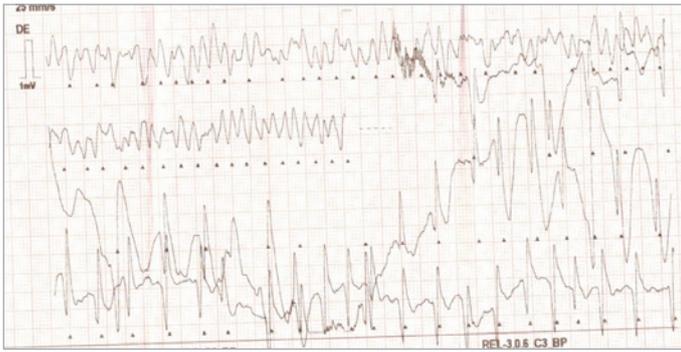


Figure 3. Electrocardiogram pattern of ventricular fibrillation upon arrival of emergency medical services.

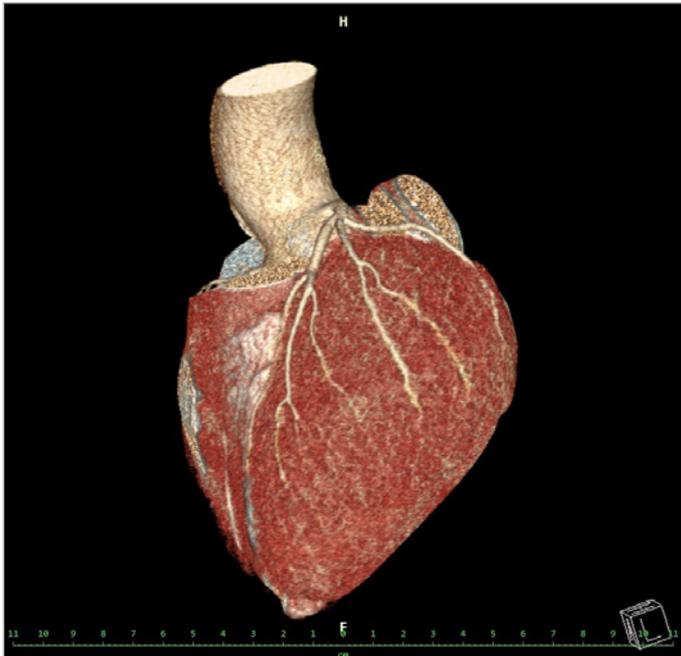


Figure 4. Negative CT coronary angiography.

[Abstract:0076]

## LDL-C LEVELS AND LIPID LOWERING TREATMENT IN CORONARY HEART DISEASE PATIENTS HOSPITALIZED BECAUSE OF ANGINAL SYNDROME

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**Background:** CHD patients are considered very high cardiovascular risk subjects, with guidelines recommended LDL-C target levels below 55 mg/dL with > 50% reduction from baselines. These levels can be reached by a combination of statins, ezetimibe and anti PCSK9 agents. Our clinical impression was that CHD patients don't reach the LDL-C target levels despite the wide availability of agents.

The aims of the study were to evaluate this hypothesis, whether hospitalization results in changes in lipid lowering regimens as well as its short-term compliance.

**Methods:** A retrospective cohort study, using data of CHD patients who were admitted to the internal medicine wards in Clalit Health Services' medical centers because of anginal syndrome during 2020-2022. The data was evaluated for: demographic and clinical characteristics, LDL-C level at admission, 6 months previously and 6-9 months after discharge, rate of reaching LDL-C target levels, lipid lowering treatment at admission, discharge, and 6-9 months after it.

**Results:** The cohort included 10540 patients. One thirds and three quarters of them didn't have lipids levels measurements up to 6 months before and during hospitalization, respectively. Only fifth of the patients reached LDL-C values <55mg/dL before and during admission, median LDL-C of 72mg/dL (53-101); around half of the patients were treated by high dose potent statins, only 10% by ezetimibe. The hospitalization didn't affect clinically significant the short-term lipid lowering treatment regimen nor LDL-C levels.

**Conclusions:** Gaps were noted between guidelines and clinical practice for reaching LDL-C target levels. Further education and strict policy are needed.

**Keywords:** LDL-C, anginal syndrome, coronary heart disease

Parameter	Value within 6 months before admission	Value during the admission	Value 6-9 months after discharge
Total cholesterol, Median (IQR)	143 (120-176)	141.70 (116-176)	135 (114-165)
Missed data, n (%)	2910 (28)	5428 (52)	6514 (62)
Triglycerides, Median (IQR)	125 (91-176)	127 (92-185)	122 (89-170)
Missed data, n (%)	3150 (30)	7499 (71)	6726 (64)
HDL cholesterol, Median (IQR)	41 (35-49)	38 (32-46)	41 (34-49)
Missed data, n (%)	3229 (34)	7790 (74)	6786 (64)
LDL cholesterol, Median (IQR)	72.10 (79-131)	72.50 (53-101)	65.50 (49.20-88.00)
Missed data, n (%)	3597 (34)	8000 (76)	6984 (66)
<b>Statins:</b>			
Total statins therapy, n (%)	7196 (69)	7523 (71)	7523 (71)
High dose potent statins*, n (%)	4690 (45)	5680 (54)	5680 (54)
Low/intermediate potency statins*, n (%)	2506 (24)	1843 (17)	1843 (17)
No statin therapy, n(%)	3344 (31)	3017 (29)	3017 (29)
Ezetimibe, n (%)	873 (8)	1110 (11)	796 (8)
PCSK9 inhibitors, n(%)	95 (0.9)	123 (1.1)	107 (1)
Bezafibrate (200mg or 400mg), n (%)	340 (3)	318 (3)	214 (2)

Table 1. Lipids profile and LLT before, during and after hospitalization

\*High dose potent statins: Atorvastatin 40-80mg and rosuvastatin 20-40mg. All other statin are considered as low-intermediate potency statins.

[Abstract:0078]

## A CLINICAL CHALLENGE OF CARDIOMYOPATHIES: BEYOND THE HEART

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The relation between the cancer and the heart is diverse. It can be affected all parts of the heart, directly or indirectly caused by the systemic manifestation of the cancer or by cancer-therapy. Paraneoplastic dermatomyositis and tumour lysis syndrome (TLS)

are two examples of systemic manifestations of cancer. Being systemic, the cardiovascular system can be affected. Heart failure and arrhythmias are the main cardiac manifestations.

A 68-year-old man with a recent diagnosis of diffuse large B-cell lymphoma waiting to begin Chemotherapy, and paraneoplastic dermatomyositis, presented at the emergency department (ED) with palpitations and dyspnoea with a week of evolution. At the physical examination, he presented with pulmonary oedema and the novo rapid atrial fibrillation (170 beats per minute). The ED workup showed an Nt-pro BNP of 8957 pg/mL, and echocardiography with severe dilated left ventricle, with a severe reduced ejection fraction and global hypokinaemia. The right ventricle had normal dimensions, but a mild reduced ejection fraction. Evolution was torpid, and two days after hospitalization, the patient developed a spontaneous TLS. Combining these findings the etiological interpretation was that paraneoplastic dermatomyositis and TLS were the triggers of AF. The combination of them was responsible for development of tachycardiopathy.

TLS was treated with better control of AF and thus, heart failure. Moreover, the chemotherapy regimen was changed to R-CEOP. This clinical case shows how the world of cardiomyopathies can be challenging and hard to understand all the complexity of the patients.

**Keywords:** Heart failure, cardiomyopathy, paraneoplastic dermatomyositis, tumor lysis syndrome

[Abstract:0079]

## LIVER-KIDNEY-HEART AXIS – TYPE 5 CARDIO-RENAL SYNDROME

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The different organs and systems interact between them in a way unique to keep the homeostasis. When one of them works badly, creates a syndrome. Cirrhosis is a chronic systemic disease. Portal hypertension (PHT) is the main complication of cirrhosis. Cirrhotic cardiomyopathy is a consequence of PHT. On the other hand, for people with cardiopathy to another reason than cirrhosis, the presence of the last can be a trigger to acute heart failure. When there is heart failure and cirrhosis, the renal system suffers the most, originating type-5 cardio-renal syndrome, a complex entity with many challenges in diagnosis and treatment. A 77-year-old woman, with heart failure with reduced ejection fraction (HFrEF), secondary to ischemic and valvular cardiopathy; chronic kidney disease (CKD), and stable decompensated cirrhosis, went to the emergency department after progressive abdominal perimeter augmentation, legs' edema and hematochezia. It was assumed acute decompensated cirrhosis, had triggered digestive bleeding.

Intravenous diuretic therapy was started, but the ascites and kidney function got worse, the Nt-pro-BNP grew-up until 1125000 pg/ml and a transthoracic echocardiography showed important signs of congestion, severe tricuspid regurgitation, with normal cardiac output. After teamwork's discussion, was assumed a type-5 cardio-renal syndrome. The treatment was begun with oral terlipressin and intravenous albumin, followed by decongestion therapy, resulting in marked improvement of clinical presentation. The kidney, heart, and liver recovered to these basal states.

**Keywords:** type-5 cardio-renal syndrome, heart failure, cirrhosis, Liver-Kidney-Heart axis

[Abstract:0083]

## POST CARDIAC INJURY SYNDROME DURING A CARDIOVASCULAR REHABILITATION STAY: ABOUT 20 CASES

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**Introduction:** Post Cardiac Injury syndrome (PCIs) is an inflammatory process that occurs during a cardiac or a pericardial injury.

**Objective:** specify the profile of PCIs during the rehabilitation stay in hospital.

**Patients and Methods:** The study focused on 20 cases recruited over 3 years (2020 to 2022), the diagnosis was based on the characteristic table or a strong suspicion.

**Results:** There were 17 men and 3 women, 50% of whom were over 65 years old. 85% had benefited from a sternotomy, 50% concerned pathology of the aorta and its branches. The diagnosis time was less than 2 weeks post-operative in 55%, between 2 and 4 weeks in 45%. No patient had a history of pericardial involvement. Symptoms were dyspnea and fever (50%), then chest tightness, tachycardia, and arthralgia. An inflammatory syndrome was constantly present. Leukocytosis was present in 66%. Unilateral pleural effusion was found in 40%. No specific electrical signs of pericarditis were noted. LVEF was reduced in a third of patients. In half of the cases, the pericardial effusion was localized (LV or RV). In the majority of the cases, there was no sign of cardiac hemodynamic impact. All patients received treatment either with colchicine-Prednisone (80%) or colchicine-Ibuprofen (20%). Almost all patients showed a favorable outcome under treatment. Note one case which required a drainage procedure in addition to medical treatment.

**Conclusions:** PCIs must be systematically discussed in the post-operative context after cardiovascular surgery during a rehabilitation stay in order to be treated early and thus prevent possible complications.

**Keywords:** PCIs, cardiovascular rehabilitation, sternotomy, inflammatory syndrome

[Abstract:0105]

## A COMPARISON STUDY ON VALIDITY OF INTERNAL JUGULAR VEIN AND INFERIOR VENA CAVA ULTRASOUND IN PREDICTING CONGESTION IN ACUTE HEART FAILURE

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**Summary and Purpose:** Inferior Vena Cava (IVC) ultrasound (US) have been suggested to predict congestion in patients with Acute Heart Failure (AHF) but has many limitations. Recent reports have proposed Internal Jugular Vein (IJV) US as alternative test. We test the efficacy for predicting congestion in AHF of IJV US.

**Methods:** This observ. study, conducted in the Hospital Maggiore in Bologna, during 2022, included adult patients with a diagnosis of Acute Heart Failure (suggestive symptoms and signs, with BNP >100 pg/ml). We enrolled 33 consecutive patients and 37 health volunteers who underwent echocardiography, IVC and IJV US exams. We measured the max and min IVC diameters, IVC collapsibility index, IVC-c; the ant-post diameter of IJV, AP-IJV-max; the max IJV area, CSA-IJV max. The Pearson Spearman's rank tests were used to assess the correlations between IVC and IJV US measures. ROC curves were used. We considered "congested" patients with IVC-max > 21mm and IVC-c < 50%.

**Findings:** The AUROC curve for detecting congestion was 0.8 (95% CI 0.7-0.9) for AP-IJV-max; 0.8 (95%CI 0.8-0.9) for CSA-IJV max; the best cut-off were 8 mm for AP-IJV-max; 0.8 cm<sup>2</sup> for CSA-IJV max (Figure 1). A significant positive correlation was found between AP-IJV-max and IVC max: r=0.6; and between CSA-IJV max and IVC max: r=0.6 (Figure 2).

**Conclusions:** In this study the Internal Jugular Vein ultrasound seems a satisfactory tools for predicting congestion, this technique could be suggested as alternative test in AHF patients.

**Keywords:** ultrasound, internal jugular vein, inferior vena cava, heart failure

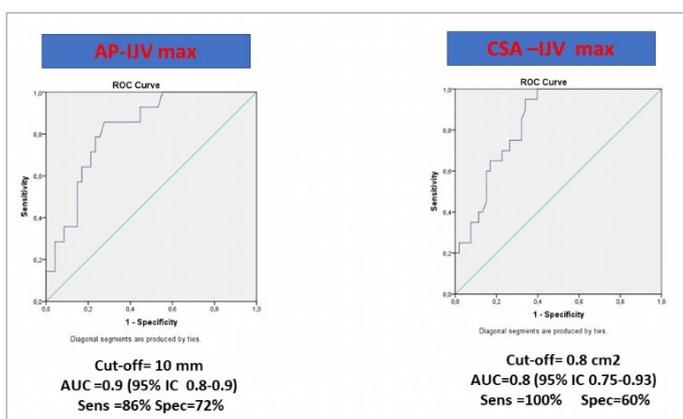


Figure 1. Accuracy in predicting ultrasound congestion of internal jugular vein ultrasound measures.

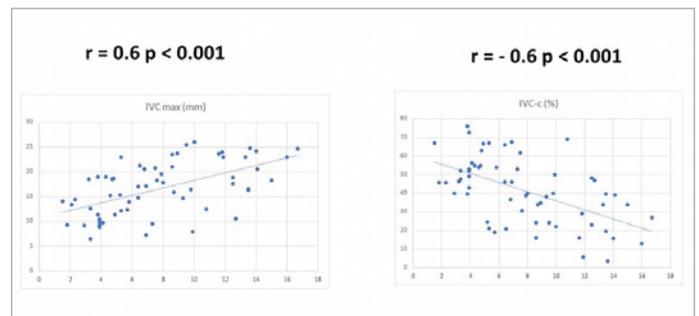


Figure 2. Correlation between AP-IJV-max and IVC-max ultrasound measures.

[Abstract:0135]

## SEQUENTIAL NEPHRON BLOCKADE BREAKS DIURETIC RESISTANCE IN ACUTE DECOMPENSATED HEART FAILURE

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**Introduction:** Diuretic resistance is a major complication during hospitalization for acute heart failure, causing congestion persistence at discharge, impacting mortality and readmission rates.

**Case:** A patient of 78 year old affected by HFrEF and Atrial Fibrillation was admitted to our unit for onset of ingravescent dyspnoea and anasarca. At home he took 50 mg of furosemide p.o. NT-proBNP is 9100 pg/ml at admission. Arterial Blood Gases showed type 1 respiratory failure. Furosemide 125 mg/die iv was administered for 3 days.

During the first two days diuresis was less 800 ml/die. Point of care ultrasound (POCUS) showed: lung US with 15 B-lines per intercostal space, inferior vena cava was over 2 cm with no inspiratory collapse, renal vein Doppler shows discontinuous biphasic flow.

Patient is still congested, and no clinical or instrumental benefit is observed. Sequential nephron blockade (SNB) was then performed for 3 days, using acetazolamide 250 mg/die p.o., potassium canrenoate 200 mg i.v., metolazone 5 mg/die p.o., Furosemide 80 mg/die iv. Diuresis increased to 3200 ml/die and respiratory failure resolution, 9 kg of weight loss, drastic oedema reduction were observed.

POCUS showed improvement of all congestion markers. No relevant electrolyte abnormalities or worsening of renal function were observed.

**Conclusions:** SNB appears to be an effective strategy to overcome most diuretic resistance mechanisms and reach efficient decongestion.

Large RCT are still lacking, further research is needed regarding safety and association with newest drugs for HF (SGLT2i, ARNI).

**Keywords:** POCUS, HF<sub>r</sub>EF, Sequential blockade, diuretic resistance

[Abstract:0144]

## COPEPTIN AND CATESTATIN AS NOVEL BIOMARKERS OF HEART FAILURE WITH PRESERVED EJECTION FRACTION

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**Aim:** To evaluate the diagnostic values of catestatin and copeptin in heart failure with preserved ejection fraction (HF<sub>p</sub>EF) and their relation to the parameters of heart rate variability (HRV) and diastolic dysfunction in patients with non-obstructive coronary artery disease (CAD).

**Methods:** Totals of 83 patients were enrolled. Echocardiography was performed according to standard protocol. HRV was assessed by 24-hour-ECG-monitoring. Serum biomarkers levels were evaluated by ELISA.

**Results:** Patients were divided into groups depending on the presence of HF<sub>p</sub>EF: HF<sub>p</sub>EF+ group (n=63, NYHA I-III FC), and HF<sub>p</sub>EF- group (n=20) (Table 1,2). Catestatin and copeptin had positive correlation between one another ( $r=0.424$ ;  $p=0.023$ ), but negative one with NT-proBNP, soluble ST2, interleukin-1 $\beta$ , and high-sensitivity CRP. The serum values of copeptin were linked with HRV parameters, when catestatin correlated with LV remodelling estimates (Table 3). Copeptin was lower by 26.2% ( $p=0.023$ ) and catestatin was lower by 43.1% in HF<sub>p</sub>EF+ group than in HF<sub>p</sub>EF- group (Figure 1). Based on ROC-analysis, the values of copeptin  $\leq 0.334$  ng/mL (AUC=0.675;  $p=0.022$ ) and catestatin  $\leq 132.83$   $\mu$ g/mL (AUC=0.884;  $p<0.001$ ) were determined as cut-off values associated with HF<sub>p</sub>EF (Figure 1). The concentrations of catestatin opposite depended on NYHA FC ( $p<0.001$ ), when copeptin did not ( $p=0.191$ ) (Figure 2). Moreover, decreased levels of catestatin  $\leq 132.83$   $\mu$ g/mL (OR 2.95; 95% CI 1.76-8.09;  $p<0.001$ ) independently associated with HF<sub>p</sub>EF.

**Conclusions:** Decreased copeptin and catestatin levels associated with HF<sub>p</sub>EF and were related to overexpression of the fibrotic and inflammatory biomarkers. The serum values of copeptin were more linked with HRV parameters, when catestatin correlated with LV remodelling estimates.

**Keywords:** Catestatin, copeptin, non-obstructive coronary artery disease, heart failure with preserved ejection fraction

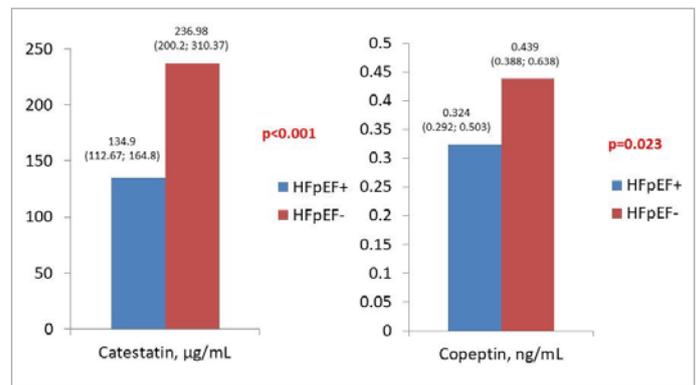


Figure 1. Catestatin and copeptin levels depending on the presence of HF<sub>p</sub>EF.

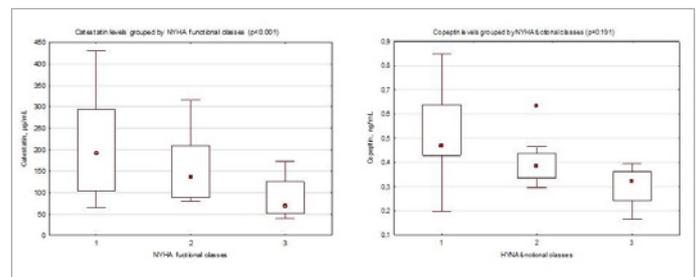


Figure 2. The levels of biomarkers depending on NYHA functional classes.

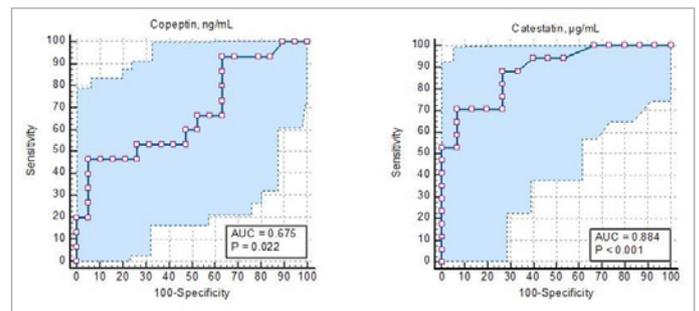


Figure 3. The ROC-curves of copeptin and catestatin levels associated with HF<sub>p</sub>EF.

Parameter	Group 1, n=63, HFpEF+	Group 2, n=20, HFpEF-	p-value
Age, years	61.5 (55; 67)	62 (58; 63)	0.895
Male sex, n (%)	36 (57.1)	8 (40.0)	0.609
Body mass index, kg/sq.m.	30.5 (28; 32)	30.8 (28.35; 33.95)	0.591
Hypertension, n (%)	46 (73.0)	17 (85.0)	0.664
Type 2 diabetes mellitus, n (%)	13 (20.6)	3 (15.0)	0.054
History of COVID-19-19, n (%)	13 (20.6)	5 (25.0)	0.123
COPD, n (%)	6 (9.5)	2 (10.0)	0.998
Smokers, n (%)	17 (27.0)	4 (20.0)	0.761
eGFR (ml/min/1.73 sq.m.)	80.5 (73; 90)	83 (74; 96)	0.981
Total cholesterol, mmol/L	4.8 (3.6; 5.38)	5.09 (3.76; 6.5)	0.382
Haemoglobin, g/dL	143 (133; 157)	145 (140; 157)	0.871
HbA1c, %	5.61 (5.32; 6.93)	5.45 (5.23; 6.78)	0.918
hsCRP, g/L (N<12 g/L)	5.2 (3.6; 10.1)	2.7 (1.3; 3.6)	0.023
Soluble ST2, ng/mL	28.41 (23.9; 36.01)	19.42 (18.24; 22.29)	<0.001
NT-proBNP, pg/mL	478.3 (209.03; 1897.75)	56.8 (43.6; 74.35)	<0.001
IL-10, pg/mL (N<10 pg/mL)	2.56 (2.34; 5.52)	4.12 (3.43; 7.43)	0.014
IL-1 $\beta$ , pg/mL (N<11 pg/mL)	3.19 (1.64; 5.47)	1.2 (0.74; 1.48)	0.046
IL-6, pg/mL (N<31 pg/mL)	2.43 (1.98; 3.98)	2.45 (1.87; 3.76)	0.657

**Table 1.** Baseline characteristics of included patients.

Note. COVID-19-19 - coronavirus disease 2019; COPD - chronic obstructive pulmonary disease; eGFR - estimated glomerular filtration rate; LDL-C - low-density lipoprotein cholesterol; HDL-C - high-density lipoprotein cholesterol; HbA1c - glycated hemoglobin; hsCRP - high-sensitivity C-reactive protein; IL - interleukin.

Parameter	Group 1, n=63, HFpEF+	Group 2, n=20, HFpEF-	p-value
Left ventricle ejection fraction, %	62 (58.5; 65)	65 (64; 66)	0.392
Left atrium, mm	42 (39; 46)	40 (38; 43)	0.734
End-systolic dimension, mm	40 (38; 43)	38.5 (36.5; 41.5)	0.306
End-diastolic dimension, mm	51.0 (48.7; 53.0)	50.5 (47.5; 52.5)	0.205
LVMmi, g/sq.m.	87 (80; 97)	82 (75.5; 86.5)	0.283
Lateral e', sm/sec	5.78 (4.98; 7.15)	8.69 (8.3; 9.65)	0.009
E/e' ratio	13.5 (13; 13.6)	12 (11; 13)	0.019
LAVI, ml/sq.m.	38.3 (35.7; 51.1)	29.7 (27.5; 47.9)	0.038
LV global longitudinal strain, %	-15.3 (-13.2; -17.2)	-20.8 (-18.7; -21.6)	0.007
TRV, m/s	2.8 (2.78; 2.87)	2.6 (2.3; 2.76)	0.021
Average NN, ms	978 (897; 993)	835 (732; 959)	0.003
SDNNidx, ms	56 (52; 71)	64 (55; 183)	0.039
rMSSD, ms	23 (12; 31)	40 (32; 328)	<0.001
SDANN, ms	53 (49; 73)	61 (57; 145)	0.006
pNN50, %	2.8 (1.2; 9.50)	13.9 (5.1; 61.5)	0.002
VLF, sq.ms.	2567 (1934; 3182)	2171 (1617; 2911)	0.019
LF, sq.ms.	586 (192; 981)	621 (321; 912)	0.098
HF, sq.ms.	347 (214; 509)	514 (371; 627)	0.016
LF/HF	1.69 (0.9; 1.93)	1.21 (0.86; 1.45)	0.059

**Table 2.** Echocardiographic and heart rhythm variability parameters.

LVMmi - left ventricular myocardial mass index; E/A - the ratio of the maximum blood flow rate in the phase of rapid filling to the maximum flow rate in atrial systole; TRV - tricuspid regurgitation peak velocity; lateral e' - early diastolic velocity of the lateral wall of the left ventricle; E/e' - the ratio of the transmitral E peak to the tissue myocardial Doppler e'; LAVI - left atrial volume indexed; SDNN - standard deviation from the mean value of the duration of all R-R intervals of sinus rhythm (NN-intervals); SDANN - the standard deviation of averaged NN-intervals recorded for all 5-minute fragments; SDNNidx - the average value of standard deviations of NN-intervals calculated from 5-minute intervals; rMSSD - the square root of the mean sum of squared differences between adjacent NN intervals; pNN50 - the value of NN50 divided by the total number of NN intervals; VLF - very low (<0.04 Hz) frequencies; LV - low (0.04 - 0.15 Hz) frequencies; HF - high (0.15 - 0.4 Hz) frequencies.

Parameter	Copeptin	p-value	Catestatin	p-value
Catestatin, $\mu$ g/mL	0.424	0.023	1.000	0.001
NT-proBNP, pg/mL	-0.418	0.045	-0.312	0.042
Soluble ST2, ng/mL	-0.223	0.123	-0.476	0.012
Interleukin-1 $\beta$ , pg/mL	-0.264	0.047	-0.375	0.009
hsCRP, g/L	-0.345	0.037	-0.363	0.021
LVMmi, g/sq.m.	-0.486	0.007	-0.412	0.009
IVST, mm	-0.131	0.963	-0.593	0.045
ESD, mm	-0.079	0.953	-0.414	0.003
LV global longitudinal strain, %	0.258	0.478	0.320	0.023
Average NN, ms	-0.284	0.039	-0.143	0.743
SDANN, ms	0.272	0.018	0.111	0.136
SDNNidx, ms	0.275	0.034	0.152	0.462
pNN50, %	0.363	0.031	0.173	0.567

**Table 3.** Correlative links.

Note. hsCRP - high-sensitivity C-reactive protein; LVMmi - left ventricular myocardial mass index; IVST - interventricular septum; ESD - end-systolic dimension; SDANN - the standard deviation of averaged NN-intervals recorded for all 5-minute fragments; SDNNidx - the average value of standard deviations of NN-intervals calculated from 5-minute intervals; pNN50 - the value of NN50 divided by the total number of NN intervals.

[Abstract:0150]

## THE ROLE OF SYSTEMIC CHRONIC INFLAMMATION IN CORONARY MICROVASCULAR DYSFUNCTION

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**Aim:** The objective of the study was to evaluate the role of systemic inflammation in patients with coronary microvascular dysfunction (CMD), and to assess its prognostic value during 12 months of follow-up period.

**Methods:** A total of 118 patients with non-obstructive CAD and preserved LVEF were enrolled. Serum levels of biomarkers were analysed by ELISA. Evaluation of LV diastolic dysfunction (DD) and global longitudinal strain (GLS) were performed baseline. CMD was defined as the myocardial flow reserve (MFR)  $\leq 2$  evaluated by dynamic CZT-SPECT (Fig. 1).

**Results:** Patients were divided into groups depending on the presence of CMD: group 1 (n=45) comprised patients with CMD, and group 2 (n=73) included patients without CMD (Table 1,2). IL-10 levels correlated with MFR (r=0.511, p=0.005), rest-MBF (r=-0.432, p=0.045) and stress-MBF (r=0.317; p=0.012) values, while IL-1 $\beta$  levels significantly correlated with MFR (r=-0.371; p=0.046) and E/e' (r=0.278; p=0.019) values, and hsCRP concentrations with MFR values (r=-0.412; p=0.019). The levels of hsCRP, IL-1 $\beta$ , and 10 differed between groups (Figure 2). Based on ROC analysis, hsCRP concentration  $\geq 4.8$  g/L (AUC=0.655; p=0.012), and NT-proBNP  $\geq 950.6$  pg/ml (AUC=0.792; p<0.001) were identified as diagnostic

markers of CMD, while Interleukins did not show diagnostic value (Figure 3). During the 12 months of follow-up, 25 patients had the adverse outcomes (Figure 4). Inflammatory biomarkers did not show prognostic values.

**Conclusions:** The presence of CMD was associated with chronic systemic inflammation, that finally leads to HFpEF development and progression. Inflammatory biomarkers did not show prognostic values during 12-month follow-up period.

**Keywords:** Systemic chronic inflammation, coronary microvascular dysfunction, non-obstructive coronary artery disease

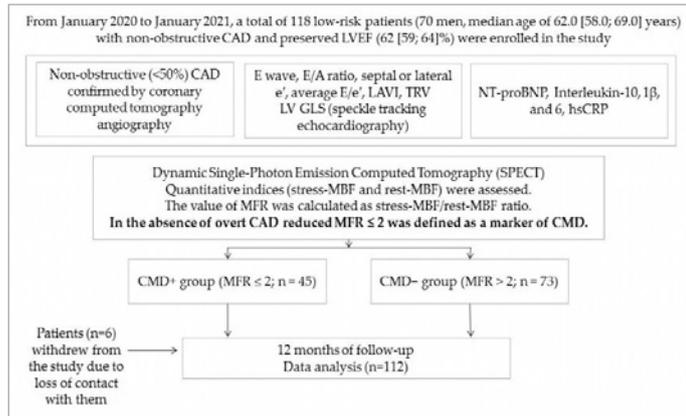


Figure 1. Study design.

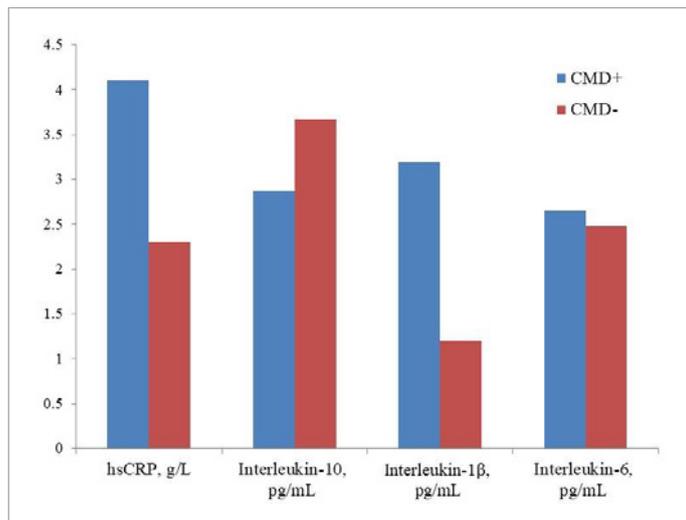


Figure 2. The levels of biomarkers depending on CMD presence.

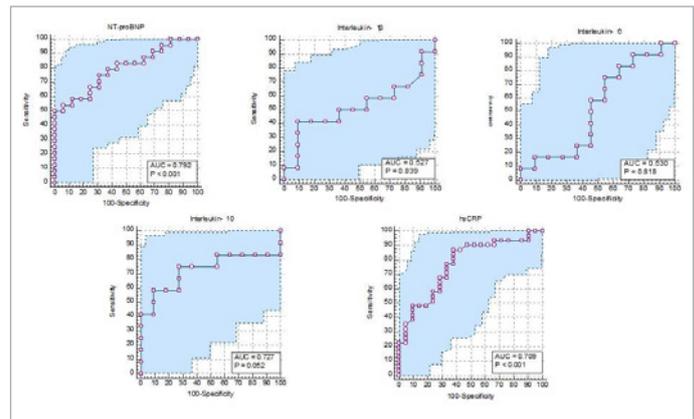


Figure 3. The ROC-curves of biomarkers in diagnostics of CMD.

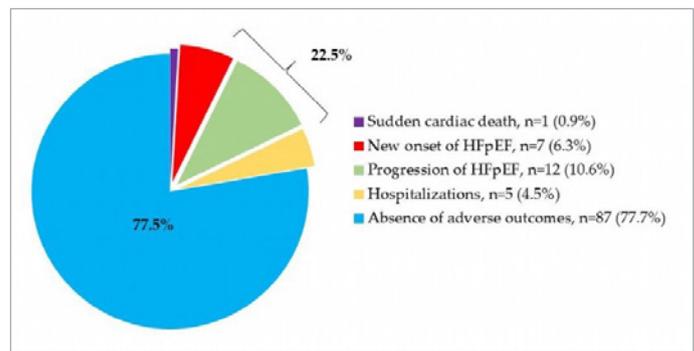


Figure 4. The adverse outcomes registered during 12 months of follow-up period.

Parameter	CMD+, n = 47	CMD-, n = 73	p-value
Age, years	61 (56; 68.5)	61.5 (59; 67.5)	0.123
Male sex, n (%)	26 (57.8)	44 (60.3)	0.901
Body mass index, kg/sq.m.	29.9 (27.8; 31.9)	30.2 (27.9; 32.1)	0.276
Hypertension, n (%)	37 (82.2)	46 (63.0)	0.069
Type 2 diabetes mellitus, n (%)	11 (24.4)	6 (8.2)	0.007
History of COVID-19-19, n (%)	7 (15.6)	12 (16.4)	0.318
COPD, n (%)	7 (15.6)	13 (17.8)	0.723
Paroxysmal AF, n (%)	7 (15.6)	11 (15.1)	0.769
HFpEF, n (%)	34 (75.6)	24 (32.9)	<0.001
Smokers, n (%)	11 (24.4)	5 (6.8)	0.009
eGFR (mL/min/1.73 sq.m.)	77.2 (63.2; 81.2)	77.0 (64.0; 85.0)	0.543
Total cholesterol, mmol/L	4.635 (3.67; 5.25)	4.33 (3.54; 4.98)	0.898
LDL-C, mmol/L	3.12 (2.15; 3.51)	2.87 (2.25; 3.87)	0.456
HDL-C, mmol/L	1.05 (0.83; 1.32)	1.05 (0.96; 1.26)	0.887
Triglyceride, mmol/L	1.67 (1.23; 1.89)	1.59 (1.22; 1.86)	0.835
Haemoglobin, g/dL	134 (121; 143)	137 (128; 142)	0.464
Potassium, mmol/L	4.64 (4.12; 5.01)	4.81 (4.43; 5.21)	0.517
Fibrinogen, g/L	3.27 (3.14; 3.14)	3.10 (2.86; 3.43)	0.767
hsCRP, g/L (N < 12 g/L)	4.1 (3.0; 11.4)	2.3 (1.1; 8.7)	0.009
NT-proBNP, pg/mL	404.2 (249.5; 1533.4)	156.3 (135.26; 274.7)	0.004
IL-10, pg/mL (N < 10 pg/mL)	2.87 (2.58; 3.57)	3.67 (3.32; 4.04)	0.048
IL-1β, pg/mL (N < 11 pg/mL)	3.19 (1.64; 5.47)	1.2 (0.74; 1.48)	0.046
IL-6, pg/mL (N < 31 pg/mL)	2.65 (1.98; 3.98)	2.48 (1.87; 3.76)	0.842

Table 1. Baseline clinical and demographic characteristics of patients. Note. CMD-coronary microvascular dysfunction; COVID-19-19-Coronavirus disease 2019; COPD-Chronic obstructive pulmonary disease; HFpEF-Heart failure with preserved ejection fraction; eGFR-Estimated glomerular filtration rate; IL-interleukin; LDL-C-Low-Density Lipoprotein Cholesterol; HDL-C-High-Density Lipoprotein Cholesterol.

Parameter	CMD+ n = 47	CMD- n = 73	p-value
Left ventricle ejection fraction, %	62 (58.5; 65.0)	63 (61; 66)	0.183
End-systolic dimension, mm	40 (38; 43)	38.5 (36.5; 41.5)	0.524
End-diastolic dimension, mm	51.0 (48.7; 53.0)	50.5 (47.5; 52.5)	0.307
LVMMi, g/sq.m.	98.0 (88.5; 114.5)	92 (85.5; 106.5)	0.276
E/A ratio	1.04 (0.79; 1.3)	0.97 (0.74; 1.2)	0.516
Lateral e', sm/sec	5.56 (4.78; 6.45)	8.56 (8.01; 9.14)	0.009
TRV, m/s	2.99 (2.95; 3.01)	2.63 (2.3; 2.76)	0.011
E/e' ratio	14 (13.5; 15.0)	11 (10; 12)	0.041
LAVI, mL/sq.m.	38.3 (35.7; 51.1)	29.7 (27.5; 47.9)	0.038
LV global longitudinal strain, %	-14.7 (-12.9; -16.9)	-20.9 (16.1; 21.6)	0.005
Diastolic dysfunction, n (%)	37 (88.1)	26 (37.1)	<0.001
Stress-MBF, mL/min/g	1.14 (0.67; 1.49)	1.63 (1.19; 1.83)	<0.001
Rest-MBF, mL/min/g	0.75 (0.54; 0.99)	0.52 (0.40; 0.69)	<0.001
Myocardial flow reserve	1.39 (1.11; 1.96)	2.69 (2.15; 3.78)	<0.001

**Table 2.** Baseline echocardiographic and dynamic SPECT parameters. Note. E/A-the ratio of the maximum blood flow rate in the phase of rapid filling to the maximum flow rate in atrial systole; E/e'-the ratio of the transmitral E peak to the tissue myocardial Doppler e'; LVMMi-left ventricular myocardial mass index; LAVI-left atrial volume indexed; TRV-tricuspid regurgitation peak velocity; lateral e'-early diastolic velocity of the lateral wall of the left ventricle.

[Abstract:0183]

## HEART FAILURE AND DEATH DETERMINANTS, A MINIMUM BASIC DATA SET (MBDS) STUDY

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The objective of our study was to determine the differences in mortality according to epidemiological variables, comorbidity, cardiovascular risk factors, baseline diseases, type of heart disease and echocardiographic parameters in patients admitted for heart failure. An observational, retrospective, single-center study was designed on the cohort of 13,343 patients admitted for first episode of heart failure at the Hospital 12 de Octubre in Madrid from 2012 to 2018 with a 2-year follow-up. Data were obtained from a CMBD (Minimum Basic Data Set) registry. A multivariate analysis was performed. Of the 13,343 patients included, 5,707 (57.3%) were women, with a mean age of 77 years (SD 15.5). The characteristics of both groups are shown in Table 1. Those patients who died were older (74.9, SD16.6 vs 81.8, SD11.8), had a higher Charlson index (2.4 SD1.5 vs 3.2 SD2), had more AF (41.4 vs 39.7, more PAD (5.9 vs 7.2%), COPD (18.7 vs 15.6%), more dementia (5.6 vs 2.3%) and more cancer (17.0 vs 5.4%) and less valvular heart disease (23.3 vs 25.7). In the multivariate analysis (Table 2), independent of the other variables, the risk factors for mortality were age (OR:1.04 CI95%1.04-1.05), comorbidity measured by the Charlson index (OR:1.31, CI95% 1.21-1.39), chronic kidney disease (OR:1.18, 1.09-1.27), OSA (OR:1.35, 1.16-1.54), dementia

(OR:1.8, 95%CI1.2-2.4) and cancer (OR:1.3, 95%CI1.18-1.42), while being female was a protective factor (0.81, 95%CI0.71-0.90). In conclusion, in our cohort the most relevant characteristics in mortality are epidemiological, comorbidity and baseline diseases rather than the different types of heart disease.

**Keywords:** Heart failure, Minimum Basic Data Set, mortality

n (13,343)	Alive		P-value
	n = 9132	n = 4211	
<b>Quantitative variables (DE):</b>			
Age (DE)	74,9 (16,6)	81,8 (11,8)	< 0,05
Charlson Index	2,4 (DE 1,5)	3,2 (DE 2)	< 0,05
<b>Qualitative variables (n [%]):</b>			
Women	4878 (53,4)	2139(50,8)	<0,05
Hypertension	6398 (70,1)	2968 (70,5)	0,62
Diabetes mellitus	2926 (32,1)	1371 (32,5)	0,37
Anaemia	1935 (21,2)	1089 (25,9)	< 0,05
Atrial fibrillation	3628 (39,7)	1745 (41,4)	0,05
Peripheral Arterial Disease	543 (5,9)	305 (7,2)	< 0,05
Chronic kidney disease	1690 (18,5)	1057 (25,1)	< 0,05
Chronic Obstructive Pulmonary Disease	1424 (15,6)	787 (18,7)	< 0,05
Obstructive sleep apnoea	1030 (7,2)	303 (9,3)	< 0,05
Dementia	206 (2,3)	235 (5,6)	< 0,05
Cancer	496 (5,4)	717 (17)	< 0,05
Ischemic cardiomyopathy	2107 (23,1)	938 (22,3)	0,31
Valvular heart disease	2343 (25,7)	982 (23,3)	0,04

**Table 1.** Main variables distribution in both groups.

n 13,343	OR	95%CI	P-value
Age	1.04	1.04-1.05	< 0,05
Charlson Index	1.31	1.21-1.39	< 0,05
Women	0.81	0.71-0.90	<0,05
Anaemia	0.93	0.85-1.04	0.08
Atrial fibrillation	0.98	0.91-1.07	0.99
Peripheral Arterial Disease	1.10	0.93-1.30	0.86
Chronic kidney disease	1.18	1.09-1.27	0,05
Chronic Obstructive Pulmonary Disease	1.05	0.93-1.2	0.37
Obstructive sleep apnoea	1.35	1.16-1.54	< 0,05
Dementia	1.8	1.2-2.4	< 0,05
LVEF	0.93	0.84-1.08	0.28
Cancer	1.3	1.18-1.42	< 0,05
Ischemic cardiomyopathy	1.02	0.91-1.16	0.67
Valvular disease	1.06	0.97-1.16	0.21

**Table 2.** Multivariable analysis.

[Abstract:0186]

## IMPACT OF ISGLT2 INHIBITORS IN A HEART FAILURE UNIT

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**Objectives:** To demonstrate a reduction in decompensations of heart failure with preserved ejection fraction (HFpEF) between the year prior to the introduction of ISGLT-2 inhibitors and the year of their initiation.

To describe which types of decompensations, classified by severity, are modified after taking the drug.

**Materials and Methods:** The population is patient heart failure unit. 52.6% are eighty and ninety years old, with gender equally divided. The first group spans from January 2021 to February 2022 (n=155), recording the total number of decompensations and hospital admissions. The second group starts from March 2022 (coinciding with the prescription initiation) until April 2023 (n=216), same variables were collected. The 2022-2023 group was classified based on the intake or not of SGLT-2 inhibitors, and the type of care according to the severity of the decompensation (admission, emergency care, unit call, and consultations coinciding with mild decompensation). Main reasons for not taking the drug: 13% unknown; 8% CKD; 5% UTI; 0.1% T1DM. This is retrospective analytical observational study. Statistical analysis was T-student for paired and T-student.

**Results:** In the first group, the average decompensations is 2.58 compared to 1.58 in the second (t 2.27 - p 0.029). The average admissions in the first group is 1.22 and in the second 0.50 (t 4.45 - p 0.029).

Admissions before initiation are 0.58 and afterwards 0.23 (t 5.15 - p 0.000), emergency visits prior to use are 0.33 and after 0.06 (t 5.73 - p 0.000). No significant difference was found in calls and consultations.

**Keywords:** ISGLT-2, HFpEF, Decompensations

[Abstract:0187]

## DOES THE LEFT VENTRICULAR EJECTION FRACTION MATTER?

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The primary objective of the study is to describe and analyse differences among patients admitted for a first episode of heart failure based on left ventricular ejection fraction (LVEF). The secondary objective is to assess survival differences based on LVEF. This observational, retrospective, single-center study focused on a cohort of patients admitted for their first heart failure episode at a tertiary hospital between 2012 and 2018, with a 2-year follow-up. The study utilized log-rank and Kaplan-Meier tests. A total of 13,343 patients were included; 5,707 (57.3%) were women with a mean age of 77 years (SD 15.5), and the Charlson index was 2.65 (SD 1.7). Among these, 74.7% had preserved ejection fraction (FE), 10.5% had mildly reduced FE, and 14.7% had reduced FE. Analyses of the three FE groups revealed that the preserved FE group had a higher mean age, a greater percentage of women, and more comorbidities (hypertension, atrial fibrillation, chronic kidney disease, chronic obstructive pulmonary disease, sleep

apnea, and cancer). The reduced FE group showed a higher prevalence of ischemic heart disease and valvular disease. Figure 1. Survival analysis based on FE indicated no differences in mortality (HR 0.98, 95% CI 0.94-1.02, p = 0.40). However, distinctions were noted in the first three months when compared to mildly reduced and reduced EF (0.864, 95% CI 0.76-0.98, p < 0.02). Figure 2. In conclusion, primary differences related to LVEF focus on comorbidity, sex, and age. LVEF does not significantly impact cohort mortality, except during the first three months.

**Keywords:** heart failure, cohort, mortality

[Abstract:0201]

## CA125 AND READMISSIONS AFTER HEART FAILURE UNIT DISCHARGE

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**Summary:** Increasing incidence and prevalence of heart failure (HF) lead to a growing need for accurate diagnostic tools and prognostic indicators to its effective management. Structured follow-up in the so-called vulnerable period, 60-90 days after hospital discharge, has been shown to improve the prognosis of patients. However, there is no evidence on the appropriate time to end the hospital follow-up of these patients. Plasma carbohydrate antigen 125 (CA125) seems to be a valuable biomarker of congestion. Although some studies have demonstrated CA125 reliability in acute HF, there is no data about its prognostic value in stable patients.

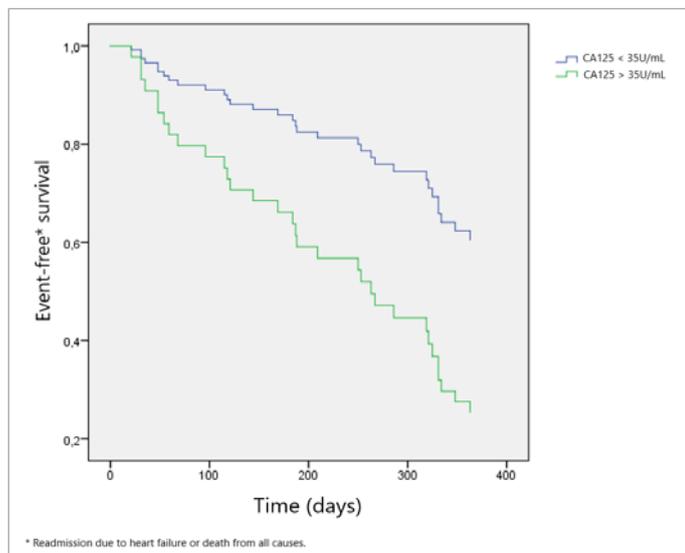
**Purpose:** Our main goal was to evaluate the value of CA125 levels in predicting readmissions in patients who completed their follow-up in an ambulatory HF program.

**Methods:** We retrospectively studied 425 consecutive patients who were discharged from the multidisciplinary HF program of a tertiary care hospital. Eligible patients included those with at least one previous hospitalization due to new-onset acute HF or decompensated chronic HF and a CA125 determination

before finishing the follow-up. The final study sample included 159 patients. We compared the populations with CA125 < 35 U/mL (n=125) and CA125 > 35 U/mL (n=34).

**Findings and Discussion:** There was no statistically significant difference between the two groups of patients except for sodium levels and previous admissions (see table). In the studied population, CA125 is a good predictor of readmission due to decompensated HF, but not of readmission for all causes or mortality. Therefore, it may be useful as a tool to identify low-risk patients who are not likely to require strict follow-up.

**Keywords:** Chronic heart failure, CA125, prognostic value, readmissions, Heart Failure Unit



**Figure 1.** Kaplan-Meier survival analysis.

Survival curves were generated through univariable Cox regression. Subsequently, a pairwise combined analysis was conducted with those variables that exhibited significant differences between both groups or were associated with a higher risk of readmissions.

Variables (mean)	CA125 < 35 U/mL (n = 125)	CA125 > 35 U/mL (n = 34)	p-value
Age (years)	84.75	84.47	0.85
Female (%)	65	68	0,5
Patients with preserved LVFE (%)	67	77	0.73
LVFE (%)	55.9	58.1	0.37
Admissions in previous 12 months	0.93	1.25	0.01
Estimated glomerular filtration rate (mL/min/1.73m <sup>2</sup> )	46	45.5	0.8
Haemoglobin (g/dL)	13.1	12.5	0.1
Sodium (mEq/L)	141	139	0.02
NT-proBNP (ng/mL)	3861	6372	0.07
NYHA functional class (1-4)	2.06	2.05	0.98
Patients under diuretic treatment (%)	88%	91%	0.42
Furosemide dose (mg)	44	51	0.32

**Table 1.** Populations comparison.

The populations with CA125 < 35 (n=125) and CA125 > 35 (n=34) were compared. Numerical variables with normal behavior were compared using the Student's t-test, while NYHA class and the number of admissions in 12 months were compared using the Mann-Whitney U test.

[Abstract:0202]

## PROGNOSTIC ROLE OF THE LEFT VENTRICULAR GLOBAL FUNCTION INDEX AND ITS COMPANION IN OUTPATIENTS WITH HEART FAILURE WITH PRESERVED EJECTION FRACTION

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Left ventricular global function index (LVGFI) is an imaging marker calculated by cardiac magnetic resonance (CMR) imaging and echocardiography and is a strong, independent predictor of major adverse cardiovascular events and mortality. LVGFI companion (LVGFIC) is a marker derived from the root mean square of the sum of LV stroke volume and LV global volume, determined by CMR, and designed to overcome the limitations of the LVGFI calculation formula.

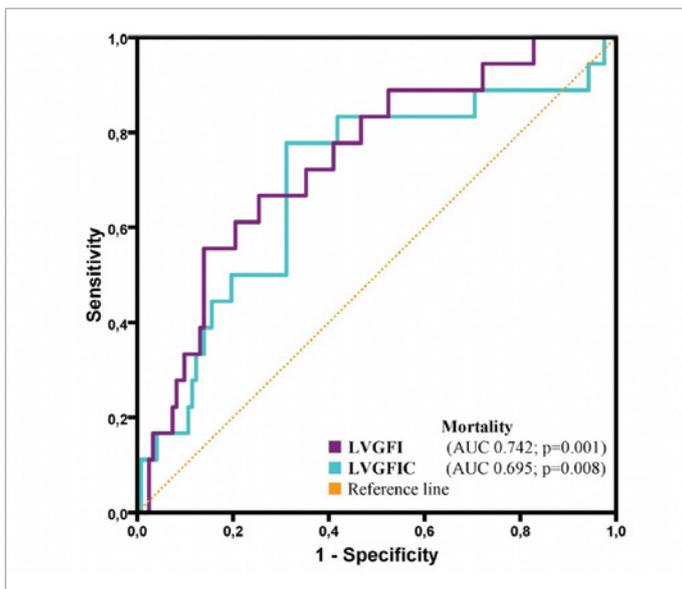
**Aim:** To evaluate the ability of LVGFI and LVGFIC to predict mortality in outpatients aged 60 years and older with heart failure with preserved ejection fraction.

**Materials and Methods:** In total, 140 outpatients with stage C heart failure were included (median age 73 [67-78] years; 43% male). Using echocardiography data for each patient, LVGFI and its companion were determined, and cut-off values were calculated for both LVGFI and LVGFIC. Mortality data were collected. Follow up duration was 34 (22-36) months in median.

**Results:** The median LVGFI was 22.4% and LVGFIC was 283.9 ml, the cut-off value for LVGFI was  $\leq 21.4\%$  (area under curve [AUC]=0.742 $\pm$ 0.060, p=0.001; sensitivity=72.2%, specificity=64.8%) and LVGFIC was  $\geq 303.6$  ml (AUC=0.695 $\pm$ 0.071, p=0.008; sensitivity=77.8%, specificity=68.9%). LVGFI  $\leq 21.4\%$  and LVGFIC  $\geq 303.6$  ml were associated with higher mortality: OR=4.45 (p<0.05) and OR=7.74 (p<0.05), respectively. Kaplan-Meier analysis showed that mortality rate was significantly higher in patients with reduced LVGFI ( $\leq 21.4\%$ , Log-rank p=0.002) and increased LVGFIC ( $\geq 303.6$  ml, Log-rank p<0.001).

**Conclusions:** LVGFI and LVGFIC were associated with higher mortality in outpatients aged 60 years and older with heart failure with preserved ejection fraction.

**Keywords:** heart failure with preserved ejection fraction, left ventricular global function index, left ventricular global function index companion, HFpEF, LVGFI, LVGFIC



**Figure 1.** Receiver operating characteristic curves for the predictive role of left ventricular global function index (LVGFI) and left ventricular global function index companion (LVGFIC) for mortality at 34 months. The area under the curve (AUC) obtained with LVGFI was 0.742,  $p=0.001$ ; with LVGFIC - 0.695,  $p=0.008$ .

[Abstract:0213]

## ADHERENCE TO TREATMENT OF OUTPATIENTS WITH DIFFERENT PHENOTYPES OF HEART FAILURE

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**Objective:** To assess the treatment adherence (TA) and ability to self-care in outpatients aged 60 years and older with heart failure (HF).

**Methods:** 31 patients (19F) underwent a clinical examination and echocardiography. TA was assessed using the National Society for Evidence-Based Pharmacotherapy Adherence Scale (0 points corresponded to complete TA; a score other than "0" was regarded as a suboptimal TA), ability to self-help - the European Self-Care Ability Scale patients with HF (9-45 points, the lower the score, the higher the patient's ability to self-help), cognitive status - the MMSE short scale.

**Results:** HF with preserved left ventricular ejection fraction (HFpEF) was detected in 58%, mildly reduced LVEF (HFmrEF) - in 19%, reduced LVEF (HFrEF) - in 23% patients. The age of patients with HFpEF was  $75\pm 9$ ; with HFmrEF -  $75\pm 9$ , with HFrEF -  $76\pm 10$  years. NYHA class II was observed in 43%; 83%, 57% of patients with HFpEF, HFmrEF, HFrEF, respectively. Probable cognitive impairment (scores of <29 points) was detected in 50%, 50%, 57% of patients with HFpEF, HFmrEF, HFrEF, respectively. Full TA was observed in 17%, 33%, 43% of patients with HFpEF, HFmrEF, HFrEF, respectively. The score of ability to self-help in patients

was  $33\pm 5$ ;  $34\pm 5$ ;  $41\pm 1$  points in patients with HFpEF, HFmrEF, HFrEF, respectively.

**Conclusions:** Most outpatients with HF had NYHA class II, probable cognitive impairment, low level of TA and the ability to self-help, regardless of LVEF. Our results reinforce the need to closely monitor outpatients with HF to improve the TA and medical education.

**Keywords:** treatment adherence, heart failure, ejection fraction

[Abstract:0228]

## CLINICAL PROFILES OF MASKED HYPERTENSION AND HIGH NORMAL BLOOD PRESSURE

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**Aim:** To evaluate the clinical profiles of patients with masked hypertension (MH) and high normal blood pressure (HNBP).

**Methods:** 28 outpatients aged 45 to 59 years were included. A standard physical examination and chemistry were performed, cardiovascular risk (CVR) was assessed using SCORE and SCORE 2.

**Results:** HNBP was revealed in 11 (50% M) patients aged  $50.5\pm 0.8$  years, MH - in 17 (100% F) patients aged  $52.7\pm 11.7$  years ( $p=0.372$ ). Dyslipidaemia was presented in 9.1% patients with HNBP, in 88.2% patients with MH,  $p<0.001$ . There were no smokers among patients with HNBP and were 35.3% smokers among patients with MH. There was an association of MH with male gender (OR 4.5, CI 1.2-17.3,  $p=0.029$ ), menopause in female (OR 9.0, CI 1.01-79.5,  $p=0.048$ ), high CVR (OR 25.2, CI 2.8-22.9,  $p=0.004$ ), hypercholesterolemia (OR 5.1, CI 1.1-25.7,  $p=0.048$ ); and association of HNBP with higher education (OR 16.7, CI 1.9-13.9,  $p=0.009$ ) or menopause (OR 0.07, CI 0.02-0.36,  $p=0.001$ ).

**Conclusions:** Middle-aged patients with MH had high CVR due to smoking and hypercholesterolemia, while HNBP can be considered as a normal variant. Self-monitoring of blood pressure is recommended for middle-aged males with high CVR for possible detection of MH.

**Keywords:** masked hypertension, high normal blood pressure, cardiovascular risk

[Abstract:0245]

## EVALUATION OF CARDIOVASCULAR EVENTS AND ADVERSE OUTCOMES IN PATIENTS WITH PERIPHERAL ATHEROSCLEROSIS

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A risk calculator for cardiovascular events and adverse outcomes was developed using binary logistic regression. The results of an examination of 195 patients with peripheral atherosclerosis were taken into account, of which fatal and non-fatal cardiovascular events and adverse outcomes over three years developed in 45 patients (ranked as "1"), and in 150 patients they were absent (ranked as "0"). The resulting mathematical expression for calculating the probability of developing cardiovascular events and adverse outcomes had the form:  $Z = \frac{\exp(K)}{1 + \exp(K)}$ , where  $K = -2.41 \cdot \text{patient gender} - 0.02 \cdot \text{patient age} + 27.2 \cdot \text{presence of hemodynamically significant stenosis (0/1)} + 0.55 \cdot \text{atherogenic index value} + 1.21 \cdot \text{HBA1C value} + 0.25 \cdot \text{Alp} - 0.02 \cdot \text{VA-48.03}$ , Z – forecast criterion, K – multiple regression coefficient. The coefficients and constant were obtained by the logistic regression method when analysing the results of the examination of an experienced sample of 195 patients. According to the results of ROC analysis, when the Z value exceeds 0.29 inclusive, with a diagnostic sensitivity of 93.75% and a diagnostic specificity of 93.41%, a conclusion was drawn about a high risk of developing cardiovascular events and adverse outcomes. The cut-off point for the predictive coefficient K, equal to 0.29, corresponded to the maximum diagnostic sensitivity and specificity. The area under the ROC curve (AUC) corresponded to  $0.976 \pm 0.0155$  (confidence interval from 0.931 to 0.995) and indicated an excellent quality of separation of patients into two classes according to the parameters included in the model. The ROC curve was statistically significantly different from the reference diagonal line ( $z = 41.539$  at  $p < 0.001$ ).

**Keywords:** peripheral atherosclerosis, long-term prognosis, fatal vascular events

[Abstract:0258]

## PATHOLOGIES AND BIOMARKERS FOR EARLY DETECTION OF INTESTINAL ISCHEMIA

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**Background and Aims:** Intestinal ischemia has high mortality rates, mainly due to a delay in diagnosis. The knowledge of which pathologies are associated with a worse prognosis and the acquisition of precise early detection biomarkers for the disease would shorten the time to diagnosis and hence its associated mortality. To determine the analytical parameters and pathologies associated with higher mortality in patients with acute intestinal ischemia.

**Methods:** An observational, case-control, multi-center study of 10 hospitals in Spain. A descriptive and a bivariate analytical study were carried out.

**Results:** A total of 705 patients were included. 54.2% were women. The median age was 81 (IQR: 73-86). 62.5% died. Hypertension was the most common cardiovascular risk factor (77%), followed by DM2 (43%), dyslipidaemia (41%), smoking (30.7%) and obesity (21%). No cardiovascular risk factors showed a statistically significant relationship with mortality ( $p > 0.05$ ). Patients who suffered from chronic kidney disease ( $p = 0.01$ ) and atrial fibrillation were related to a higher mortality ( $p = 0.013$ ). The following biomarkers were related to worse prognosis: pH ( $p = 0.001$ ), glucose ( $p = 0.003$ ), leukocytosis ( $p = 0.0001$ ), CPK ( $p = 0.017$ ), urea ( $p = 0.0017$ ) y creatinine ( $P = 0.001$ ). CRP and lactic acid were not statistically significant ( $P = 0.24$ ,  $p = 0.67$ ).

**Conclusions:** Intestinal ischemia is a challenge. Knowing the pathologies and analytical parameters that are associated to a worse prognosis can help the clinician to take a more aggressive attitude and select the most serious cases. It would be advisable to carry out a multivariate analysis giving a specific value to the different statistical findings, and thus be able to create a risk equation.

**Keywords:** Intestinal ischemia, biomarkers, prognosis.

[Abstract:0259]

## WHAT DOES AN INTERNIST DOCTOR HAVE TO LOOK FOR AFTER A SUDDEN VISUAL LOSS?

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**Case Description:** A 75-year-old came to the emergency room due to acute and painless loss of vision. Her medical history included arterial hypertension and diabetes mellitus. A fundus examination was performed by the ophthalmologist. The patient was diagnosed with an occlusion of the central retinal artery (CRAO) and she was referred to an internist doctor to determine the aetiology and to perform a study of other vascular territories.

**Clinical Hypothesis:** CRAO in study. Diagnostic pathways: Physical examination showed a diastolic murmur in the aortic focus. The rest of the examination was normal.

A complete blood test and electrocardiogram were performed without any notable alteration being detected. The study was completed with an ocular echography, showing the calcific embolus and echocardiography showing a calcified aortic valve and severe aortic insufficiency. An MRI, echo-doppler of the supraaortic trunks and ultrasound of the temporal arteries were also requested. All of them were negative. Following the results, the patient was diagnosed with a CRAO secondary to a calcific embolus from the aortic valve.

**Discussion and Learning Points:** CRAO is an ocular and systemic emergency. It is recognized as a stroke equivalent. An embolism is the most common cause of CRAO. In situ thrombosis may also cause artery occlusion. Thrombi may be due to atherosclerotic disease, collagen-vascular disease, inflammatory states, and/or hypercoagulable states. Rapid differentiation between those diseases is important in order to initiate an optimal therapy and improve patient outcomes. Retinal microcirculation is a very interesting opportunity to assess vascular risk and identify other pathologies.

**Keywords:** occlusion of the central retinal artery, valvulopathy, embolism, thrombi

[Abstract:0300]

## CASE REPORT: VENTRICULAR TACHYCARDIA DUE TO MYOCARDITIS

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Myocarditis is an inflammation of the heart muscle, with widely varying aetiology and severity. Symptoms of myocarditis include

palpitations, chest pain/discomfort, acute onset of or sudden worsening of heart failure (HF), and cardiac arrhythmias.

**Case:** A 53-year-old man presented at the emergency department with hypotension, the feeling of rapid heartbeat, and loss of consciousness. ECG revealed the ventricular tachycardia which was treated with the electrical cardioversion. The patient was offered a coronary angiography, but he refused and went home. After one week he returned to the hospital with shortened breath and chest pain, which was irradiating to the left hand. The pain was prolonged for >10 min.

**Primary hypothesis and diagnostic pathways:** The primary hypothesis was subendocardial myocardial infarction, although no significant damage to the heart vessels was revealed by coronary angiography. TTE echocardiography 2D revealed left ventricle hypertrophy and reduced ejection fraction EF- 45%. No other considerable changes were found.

Cardiac magnetic resonance study with gadolinium was performed to verify the diagnosis. A picture of previous myocarditis was revealed, with fibrotic areas on the postero-lateral wall, which is most likely to be the source of ventricular tachycardia.

**Treatment:** The patient belonged to the group of high risk of sudden cardiac death, so a cardioverter-defibrillator was implanted.

**Conclusions:** This case illustrates the potential complication of myocarditis, that can be fatal if not treated. So, it's important to make differential diagnosis and start appropriate treatment.

**Keywords:** myocarditis, fibrosis, ventricular tachycardia

[Abstract:0303]

## THE EFFECT OF DIABETES ON MORTALITY AND HOSPITALIZATION DURATION IN GERIATRIC PATIENTS WITH NON-VALVULAR ATRIAL FIBRILLATION

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**Aim:** It has been suggested that the presence of type 2 diabetes mellitus (T2DM) is associated with morbidity and mortality in atrial fibrillation (AF). We aimed to investigate the effect of diabetes on the hospitalization time and 6-months mortality in geriatric patients with AF.

**Materials and Methods:** We included retrospectively 178 patients over the age of 65, with or without diabetes, diagnosed with non-valvular atrial fibrillation, who were hospitalized in the Kartal Dr. Lutfi Kirdar City Hospital's Internal Medicine ward between 2020 and 2023. Patients with valvular atrial fibrillation were excluded from the study.

**Results:** 82 of 178 (46.3%) geriatric patients with AF had T2DM. 55 (31.1%) were male and 122 (68.9%) were female. The mean age was 78.79±6.88years. Primary reason for hospitalization was decompensated heart failure (32.7%). Mortality rates were

similar in patients with and without diabetes (29.3% vs 21.1%,  $p=0.208$ ). Hba1c levels were similar according to mortality ( $6.36 \pm 1.38$  vs  $6.32 \pm 1.12$ ,  $p=0.314$ ). Non-survivors had higher Charlson score, higher pro-BNP and lower ejection fraction than survivors ( $p<0.01$  for all). In binary logistic regression analysis, the presence of malignancies (OR=0.229,  $p=0.003$ ) and decompensated heart failure (OR=0.305,  $p=0.04$ ) have an effect on mortality regardless of age and sex. On the other hand, presence of T2DM had an effect on hospitalization duration (OR=0.425,  $p=0.009$ ).

**Conclusions:** T2DM diabetes was not associated with mortality in geriatric patients with AF. However, T2DM associated with the increased duration of hospitalization regardless of glycaemic regulation. In addition, decompensated heart failure and malignancies were associated with increased mortality in patients with AF in geriatric population.

**Keywords:** Atrial fibrillation, type-2 diabetes mellitus, heart failure, mortality

[Abstract:0328]

## MACROPHAGES OF THE CARDIOSPLENIAL AND CARDIORENAL AXES IN THE POST-INFARCTION MYOCARDIAL REGENERATION

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**Purpose:** to access the complex dynamics of macrophages (mf) in patients with myocardial infarction (MI) and correlations between their number and adverse outcomes.

**Methods:** We analysed sections of the infarct area of the myocardium (IA), kidneys, red (RP) and white pulp (WP) of the spleen, taken from patients ( $n=30$ ) with fatal MI. Macrophage infiltration was assessed by immunohistochemistry (antibodies CD68, CD163, CD206, stabilin-1). Patients were divided into two groups: 1- died in the early post-infarction period, 2- in the late period (after 3 days).

**Results:** Numbers of all investigated cells in the IA increased to the long-term period of MI: CD68+ from 59 (52; 95) to 376 (136; 634), CD163+ from 82 (34; 285) to 697 (545; 982), stabilin-1+ from 0 (0; 1) to 126 (42; 216), CD206+ from 21 (12; 43) to 99 (31; 249); only the numbers of CD206+ cells in the kidneys decreased from 6 (5; 8) to 2 (1; 2) ( $p<0.05$ ). In the spleen we did not reveal any dynamics. The number of CD68+ cells correlated with the development of left ventricular aneurysm ( $r=0.7$ ), CD206+ cells correlated with the timing of death ( $r=-0.6$ ) and with acute heart failure ( $r=0.5$ ) ( $p<0.05$ ).

**Conclusions:** The concentration of mf in patients with MI increased in the IA to the late period of MI and did not change in the spleen. In the kidneys the number of CD206+ cells decreased.

A concentration of CD206+ in the kidneys and CD68+ cells in the RP was related with a poor prognosis.

**Keywords:** Macrophages, inflammation, myocardial infarction

[Abstract:0354]

## LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN TYPE 2 DIABETIC PATIENTS

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Type 2 diabetics are at risk of developing cardiovascular complications, including diabetic cardiomyopathy, especially after a certain duration of development. The latter is characterized by left ventricular hypertrophy and diastolic dysfunction (LVDD), data for which remain insufficient in our country.

Our study is cross-sectional observational with an analytical aim and prospective recruitment, the main objective of which is to estimate the prevalence of LVDD in type 2 diabetics.

For 19% of subjects, diabetes has less than a year, 28.5% from 1 to 5 years, 23% from 5 to 10 years and 29.5% more than 10 years. 54.5% received exclusive OADs, 29.5% basal insulin, 16% intensive insulin therapy. In 65% the glycaemic balance is not reached. We found peripheral neuropathy in 43.5%, nephropathy in 19.5% and 10.5% were followed for retinopathy. Lower limbs obliterating arteriopathy (LLOA) is found in 23% of cases and only one patient with a history of stroke.

The exploration of diastolic function revealed a prevalence of 47.5%. We found a very significant relationship between the duration of diabetes progression and the prevalence of LVDD ( $p=0.001$ ), as well as for HbA1c ( $p=0.004$ ), as well as LVH ( $p<0.001$ ). Microvascular complications, including nephropathy, are strongly correlated with LVDD ( $p=0.002$ ), as well as with LLOA ( $p=0.02$ ) and hypertension; unlike LDL-C.

The prevalence of diastolic dysfunction in type 2 diabetics remains relatively high, asymptomatic and correlated with other comorbidities. However, it remains under-diagnosed in daily practice despite the ease of its exploration.

**Keywords:** Diastolic dysfunction, diabetes, heart failure, Algeria

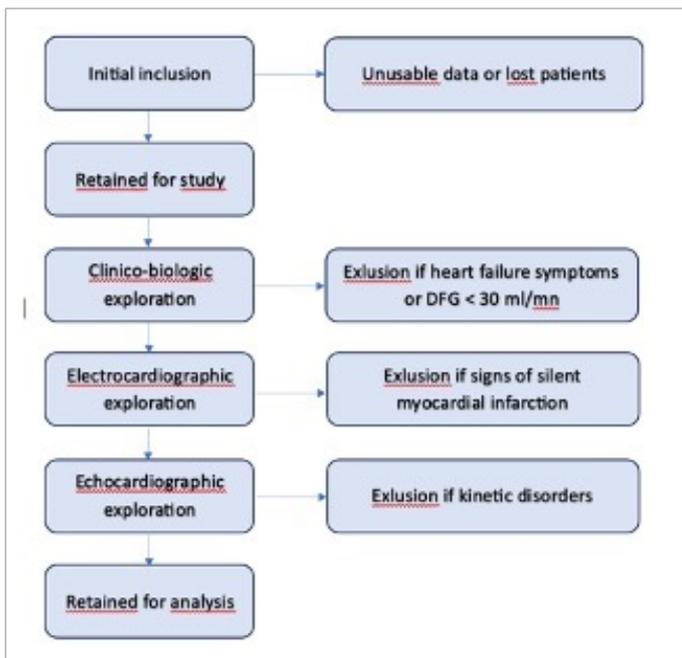


Figure 1. Study protocol design.

	N	Mean value	Median	Mode	Ecart-type	Min	Max
IVSd	200	11.10	10.00	10	2.031	6	16
LVPWd	200	10.65	10.00	10	1.796	7	16
LVEF	200	67.69	68.50	70.0	6.39	50.0	82.0
E/A	200	1.03	1.02	0.77	0.30	0.49	2.15
E/E'	200	7.00	6.70	5.40	2.17	4.03	17.13
DT	200	192.57	190.00	190	19.48	145	226

Table 1. Echocardiographic values for the study population.

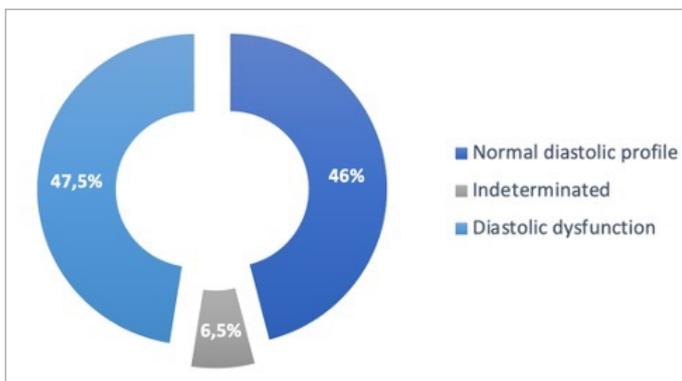


Figure 2. Diastolic dysfunction prevalence.

	Odds ratio (OR)	Lower	superior
5 years (0.00 / 1.00)	2.627	1.353	5.101

Table 2. LVDD risk level for 5 years diabetes duration.

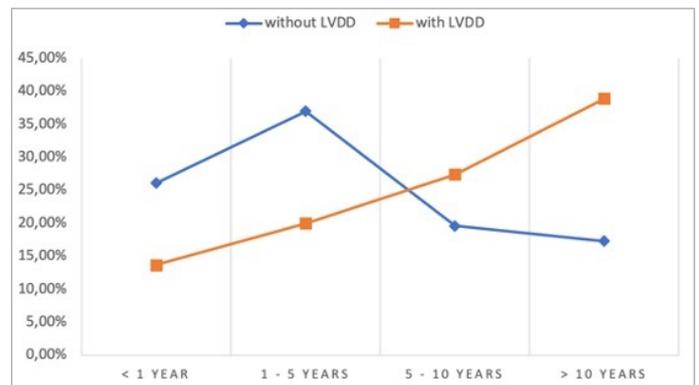


Figure 3. Correlation between diabetes duration and LVDD.

	Odds ratio (OR)	Lower	Superior
10 years (0.00 / 1.00)	3.203	1.744	5.885

Table 3. LVDD risk level for 10 years diabetes duration.

	Odds ratio (OR)	Lower	Superior
HbA1c > 7% (0 / 1)	2.393	1.312	4.366

Table 4. LVDD risk level for HbA1c superior than 7%.

Variables	p value
Diabetes duration	< 0.001
HbA1c	0.004
LVH	< 0.001
Microvascular complications	< 0.001
Macrovascular complications	0.006
Nephropathy	0.004
High blood pressure	0.010
Obesity	0.003
Dyslipidaemia	0.325
Smoking	0,602
General model statistics	< 0,001

Table 5. Multivariate analysis for the correlation between study variables and LVDD.

[Abstract:0365]

## IRON DEFICIENCY IN HEART FAILURE: A RETROSPECTIVE STUDY IN AN INTERNAL MEDICINE WARD

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Iron deficiency anaemia is a significant prognostic factor in heart failure (HF), affecting over 50% of HF patients. Ferric carboxymaltose, the primary treatment, has demonstrated efficacy in reducing future hospitalizations. The European Society of Cardiology recommends investigating anaemia and iron deficiency in all HF patients, particularly in symptomatic HF with ejection fraction below 50%, aiming to prevent subsequent hospitalizations. The management of iron deficiency in HF with preserved ejection fraction remains under study. This research focused on assessing the prevalence of iron deficiency in HF patients and its management. Examining medical records of 111 patients admitted to our ward in 2022 with a primary HF diagnosis, we analysed HF characterization, presence of anaemia, iron deficiency investigation and treatment. Of the analysed records, 55.0% exhibited preserved ejection fraction, 13.5% moderately reduced, and 17.1% reduced ejection fraction, with 14.4% lacking ejection fraction information. Anaemia was prevalent in 68.5% of patients, with 74.8% screened for iron deficiency, and 55.5% diagnosed with iron deficiency. The prevalence of iron-deficiency anaemia was 31.5%, accounting for 53.6% of patients with available studies. Notably, 35.7% of HF patients with reduced or moderately reduced ejection fraction and iron deficiency received ferric carboxymaltose during hospitalization.

These results are consistent with existing literature on iron-deficiency anaemia in HF. It is significant to highlight that while most patients undergo recommended screening for iron deficiency, not all receive treatment during hospitalization, necessitating further analysis of contributing factors.

**Keywords:** Heart Failure, Iron Deficiency, Ferric carboxymaltose

[Abstract:0375]

## PROGNOSTIC ROLE OF HEART FAILURE IN PATIENTS WITH INFECTIVE ENDOCARDITIS

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**Purpose:** To study the incidence and prognostic significance of heart failure (HF) in infective endocarditis (IE).

**Materials and Methods:** The study included 345 patients with definite IE (DUKE 2015) hospitalized in a hospital from 2012 to 2022. Median age 56.0 [37.0-71.0] years, 225 (65.2%) men. Standard laboratory, instrumental and etiological examinations were conducted. In-hospital and long-term outcomes after 10 years were assessed.

**Results:** Complicated IE was diagnosed in 95.6% (n=330) patients. HF on admission was present in 78.0% (n=269) patients (NYHA I-7.2% (n=25), NYHA II-23.2% (n=80), NYHA III-39, 4% (n=136) and NYHA IV-8.1% (n=28)). During antibacterial therapy, the incidence of HF decreased by 2 times (n=124, 36.0%).

In-hospital mortality was 31.6% (n=109). Cardiac causes were identified in 63.3% (n=69), of which progressive HF-58.0% (n=40). Mortality after 1 year was 37 (15.7%), after 3-25 (13.7%), after 5-21 (14.0%), after 7-11 (9.8%), after 10-10 (15.4%). At 1 and 3 years, the main cause of death was IE (41.0% and 20.0%) and HF (22.0% and 32.0%), respectively. After 5-7-10 years, there was a decrease in IE (5.0% and 18.0% and 10.0%) and an increase in HF (38.0% and 37.0% and 0%), as well as non-cardiac reasons (48.0% and 17.0% and 40.0%), respectively.

Using stepwise logistic regression, it was revealed that HF is an independent predictor of hospital mortality [OR 7.4 (95% CI 2.69-20.35), p=0.001], and in Cox analysis it increases the risk of 1-year mortality [OR 2.57 (95% CI 1.69-3.91), p=0.001].

**Conclusions:** HF frequently complicates the course of IE. Despite a decrease in its frequency during antibacterial therapy in the hospital, in the long term its significance progresses and determines an unfavourable prognosis.

**Keywords:** Prognosis, infective endocarditis, heart failure

[Abstract:0383]

## PRO-INFLAMMATORY BIOMARKERS AND PROGRESSION OF ATHEROSCLEROSIS IN PATIENTS WITH MYOCARDIAL INFARCTION WITH NON-OBSTRUCTIVE CORONARY ARTERIES: 1-YEAR FOLLOW-UP

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The objective of our study was to evaluate the concentrations of pro-inflammatory biomarkers in patients with acute myocardial infarction (AMI) with non-obstructive coronary arteries (MINOCA) compared to patients with AMI with obstructive coronary arteries (MI-CAD) in the early post-infarction period and after 1 year and to perform a comparative analysis of the relationship between laboratory biomarkers and atherosclerosis progression in patients with MINOCA and MI-CAD.

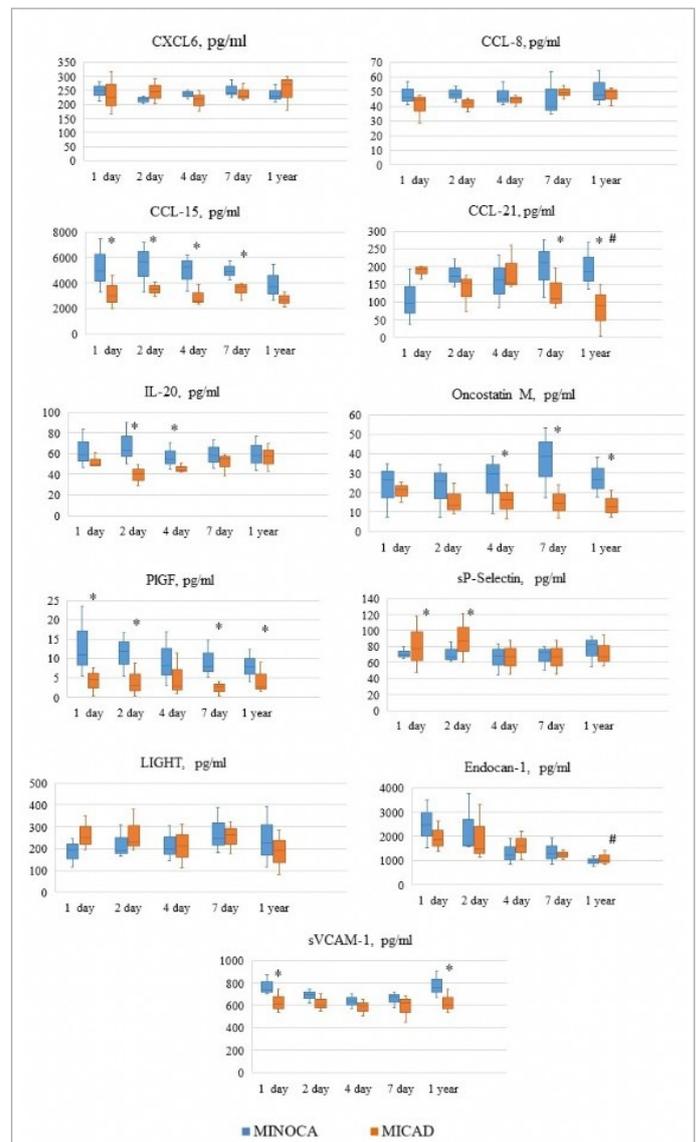
**Methods:** Samples of peripheral venous blood were collected upon admission and on days 2, 4, and 7 of hospitalization and after 1 year. An extended multiplex analysis was performed in blood

serum. MDCT-CA was performed on day 7 and 1 year after AMI to assess the progression of atherosclerosis.

**Results:** The level of hsCRP was elevated upon admission in MINOCA ( $p=0.05$ ), but it was comparable in two groups at other time. Despite comparable levels of cytokines CXCL-6, LIGHT, CCL-8, endocan-1 in both groups, MINOCA patients had a greater increase in pro-inflammatory cytokines PIGF, oncostatin M, IL-20, and CCL-15, sVCAM-1 in the early post-infarction period and in CCL-21, sVCAM-1, oncostatin M, and PIGF after 1 year. In MINOCA group, factors associated with atherosclerosis progression were concentrations of sVCAM-1 and CCL-21, while in MI-CAD group, concentrations of CCL-8 and CXCL6 were the main determinants of atherosclerosis progression.

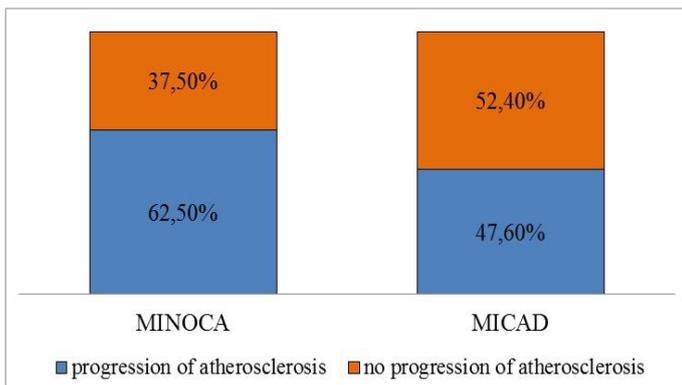
**Conclusions:** MINOCA and MI-CAD patients exhibited differences in a pro-inflammatory biomarker profile in the early post-infarction period and after 1-year follow-up. The key factors that were associated with atherosclerosis progression in MINOCA patients are sVCAM-1 and CCL-21, In MI-CAD patients were CCL-8 and CXCL-6.

**Keywords:** non-obstructive coronary artery atherosclerosis, myocardial infarction with non-obstructive coronary arteries, inflammation, endothelial dysfunction, cytokines



**Figure 1.** Indicators of multiplex analysis of blood serum of the studied groups.

Note: \*  $p < 0,05$  when comparing between groups; #  $p < 0,05$ , when comparing within-group scores one year later; CXCL6 - chemokine ligands 6; LIGHT - tumour necrosis factor ligand; CCL-15 - leukotactin-1; CCL-21 - 6Ckine/Exodus-2; CCL-8 - monocyte chemotactic protein-2; sVCAM-1 - Serum Soluble Intercellular Adhesion Molecule-1.



**Figure 2.** The ratio of patients with progression of atherosclerosis in both groups.

$p=0.21$ . MINOCA - patients with acute myocardial infarction and non-obstructive coronary arteries MI-CAD - patients with AMI with obstructive coronary arteries.

[Abstract:0408]

## DIFFERENTIATING CARDIAC AMYLOIDOSIS TYPE: CLINICAL DISTINCTION

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**Introduction:** Amyloidosis is a systemic infiltrative disease produced by tissue deposition of misfolded proteins (light chains in AL and transthyretin in ATTR) and cardiac involvement increases mortality risk in both. While cardiac involvement is similar in AL and ATTR amyloidosis, systemic manifestations may help to differentiate both entities and to choose the biopsy site to get a certain and fast diagnosis.

**Objectives:** To describe characteristics of patients with light chain amyloid cardiomyopathy (AL-CM) and transthyretin amyloid cardiomyopathy (ATTR-CM) and to compare their clinical features at the moment of diagnosis.

**Methods:** We retrospectively analysed 10 AL-CM patients and 56 ATTR-CM patients in a third level hospital, consecutively included between January 2022 until January 2023. Epidemiological, clinical, and imaging variables of AL-CM and ATTR-CM patients were recorded and compared.

**Results:** Table 1 summarizes patient characteristics. 20% of AL-CM and 37.5% of ATTR-CM patients had low QRS voltage in electrocardiogram. 30% of AL-CM patients and 26.8% of ATTR-CM patients were treated with angiotensin convertase enzyme inhibitors (ACEi) and 20% of AL-CM patients and 21.4% of ATTR-CM patients received betablockers. None AL-CM cases presented with musculoskeletal disorders, while carpal tunnel syndrome, lumbar stenosis and biceps tendon rupture appeared in 26.8%,

25% and 16.1% in ATTR-CM patients respectively. AL-CM patients seemed trend to have more albuminuria.

**Conclusions:** Improving management of patients with amyloid cardiomyopathy is possible, as some of them are still on treatments that are not recommended and not well tolerated (such as ACEi and betablockers). Musculoskeletal manifestations should suggest ATTR-CM, while albuminuria, AL-CM.

**Keywords:** amyloid cardiomyopathy, AL amyloidosis, ATTR amyloidosis, musculoskeletal manifestations, albuminuria, biopsy site

Patient description	AL-CM Total (n=10)	ATTR-CM Total (n=56)
Age (years)	61,5 (47-83)	79 (75-85)
Female, n (%)	4 (60)	11 (19.6)
Diabetes, n (%)	1 (10)	14 (25.0)
Smoker, n (%)	2 (20)	14 (25.0)
Dyslipidemia, n (%)	5 (50)	30 (53.6)
Hypertension, n (%)	4 (40)	39 (69.6)
Obesity, n (%)	1 (10)	9 (16.1)
Atrial fibrillation, n (%)	3 (30)	31 (55.4)
Ischemic disease, n (%)	1 (10)	5 (8.9)
Previous revascularization, n (%)	1 (10)	2 (5.4)
Pacemaker, n (%)	0	4 (7.1)
Heart failure hospitalization, n (%)	5 (50)	26 (46.4)
Cerebral ischemia, n (%)	0	1 (1.8)
Chronic obstructive pulmonary disease, n (%)	4 (40)	3 (5.4)
NYHA functional class, n (%)		
I	3 (80)	17 (30.4)
II	1 (20)	32 (57.1)
III	0	7 (12.5)
Sinus rhythm, n (%)	10 (100)	29 (51.8)
Atrioventricular block, n (%)	2 (20)	0
Low QRS voltage, n (%)	2 (20)	20 (35.7)
<b>Treatment</b>		
Anticoagulation, n (%)	2 (20)	30 (53.6)
Antiplatelet therapy, n (%)	1 (10)	7 (12.5)
ACEi, n (%)	3 (30)	15 (26.8)
ARB, n (%)	1 (10)	17 (30.4)
Betablocker, n (%)	2 (20)	12 (21.4)
ARNi, n (%)	0	1 (1.8)
MRA, n (%)	1 (10)	7 (12.5)
SGLT2 inhibitor, n (%)	0	2 (11.3)
Loop diuretic, n (%)	5 (50)	40 (71.4)
Digoxin, n (%)	0	2 (3.6)
Antiarrhythmic drugs, n (%)	0	4 (7.1)
<b>Clinical signs</b>		
Carpal tunnel syndrome, n (%)	0	15 (26.8)
Lumbar stenosis, n (%)	0	14 (25.0)
Biceps tendon rupture, n (%)	0	9 (16.1)
Polyneuropathy, n (%)	2 (20)	7 (12.5)
Dementia, n (%)	0	4 (7.1)
<b>Laboratory values</b>		
Creatinine (mg/dl)	1,02 (0,79 - 1,43)	1 (0,8 - 1,36)
Hemoglobin (g/dl)	13,1(11,68 - 14,23)	13,0 (12,0 - 14,0)
Leucocytes (n/mm <sup>3</sup> )	6625 (6360- 9187)	7000 (6000 - 8000)
NT-proBNP (pg/dl)	2325 (1537,75 - 3460)	2490 (1475 - 5905)
Serum proteins (g/dl)	5,9 (5,25 - 7,85)	7,0 (6,0 - 7,0)
Urine proteins (g/dl)	1921 (1763 - 3206)	8,0 (4,0 - 47,5)
Serum albumin (g/dl)	3,45 (2,98 - 3,93)	4,0
Albuminuria (mg/dl)	886 (402,4 - 2098,78)	13,0 (3,0 - 72,3)

**Table 1.** Characteristics of patients with AL and ATTR cardiomyopathy. AL-CM = light chain amyloid cardiomyopathy; ATTR-CM = transthyretin amyloid cardiomyopathy; NYHA = New York Heart Association; ACEi = angiotensin-converting enzyme inhibitors; ARB = angiotensin receptor blockers; ARNi = angiotensin receptor-neprilysin inhibitors; SGLT2 = sodium glucose cotransporter 2 inhibitors; NT-proBNP = N-terminal pro-B-type natriuretic peptide.

[Abstract:0412]

## PULMONARY THROMBOEMBOLISM IN A PARANEOPLASTIC CONTEXT

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**Introduction:** Pulmonary thromboembolism (PTE) has a variable presentation, which makes diagnosis challenging. In addition to being important to diagnose PTE and institute hypocoagulant therapy in a timely manner, it is also important to study the aetiology, especially in patients without obvious risk factors.

**Case:** Male patient, 49 years old, with a history of high blood pressure. The patient went to the emergency department due to progressively worsening dyspnoea and oedema of the lower limbs, with 15 days of evolution. He denied chest pain, fever, or orthopnoea, but he reported asthenia and anorexia that had lasted for a month. The eco-doppler of the lower limbs demonstrated bilateral popliteal vein thrombosis and the thoracic CT angiography revealed the presence of pulmonary thromboembolism. The patient was hospitalized with an intermediate-high risk PTE and started hypocoagulation therapy. During hospitalization, despite documented deep venous thrombosis upon admission, the patient underwent an extended analytical and imaging study because of the complaints of asthenia and anorexia with prolonged evolution. In fact, the abdominal resonance performed showed multiple hepatic nodules, in a non-cirrhotic liver, compatible with metastasis; analytically, there was a marked increase in alpha-fetoprotein, without associated cytocholelasis or hyperbilirubinemia. The histological result of the liver biopsy was compatible with hepatocellular carcinoma and the patient was referred to Oncology.

**Conclusions:** There are multiple aetiologies for pulmonary thromboembolism. In fact, this case was a clinical challenge in that, despite an associated DVT event, the PTE seemed to occur in a paraneoplastic context, with a new diagnosis of hepatocellular carcinoma.

**Keywords:** pulmonary thromboembolism, paraneoplastic syndrome, hepatocellular carcinoma

[Abstract:0418]

## EJECTION FRACTION AT HOSPITAL ADMISSION STRATIFIES MORTALITY RISK IN HFmrEF PATIENTS AGED $\geq 70$ YEARS: A RETROSPECTIVE ANALYSIS FROM A TERTIARY UNIVERSITY INSTITUTION

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During the last few years, increasing focus has been placed on heart failure with mildly reduced ejection fraction (HFmrEF), an intermediate phenotype from preserved to reduced EF. However, clinical features and outcome of HFmrEF in elderly patients aged  $\geq 70$  yrs have been poorly investigated. The present study retrospectively included all consecutive patients aged  $\geq 70$  yrs discharged from our Institution with a first diagnosis of HFmrEF, between January 2020 and November 2020. All patients underwent transthoracic echocardiography. The primary outcome was all-cause mortality, while the secondary one was the composite of all-cause mortality + rehospitalization for all causes over a mid-term follow-up. The study included 107 HFmrEF patients (84.3 $\pm$ 7.4 yrs, 61.7% females). Patients were classified as "old" (70-84 yrs, n=55) and "oldest-old" ( $\geq 85$  yrs, n=52) and separately analysed. As compared to the "oldest-old" patients, the "old" ones were more commonly males (58.2% vs 17.3%, p<0.001), with history of coronary artery disease (CAD) (54.5% vs 15.4%, p<0.001) and significantly lower EF (43.5 $\pm$ 2.7% vs 47.3 $\pm$ 3.6%, p<0.001) at hospital admission. Mean follow-up was 1.8 $\pm$ 1.1 yrs. During follow-up, 29 patients died and 45 were re-hospitalized. Male sex (HR 6.71, 95%CI 1.59-28.4), history of CAD (HR 5.37, 95%CI 2.04-14.1) and EF (HR 0.48, 95%CI 0.34-0.68) were independently associated with all-cause mortality in the whole study population. EF < 45% also predicted the composite of all-cause mortality + rehospitalization for all causes. EF at hospital admission is independently associated with all-cause mortality and rehospitalization for all causes in elderly HFmrEF patients over a mid-term follow-up.

**Keywords:** elderly, ejection fraction, heart failure, HFmrEF, outcome predictor

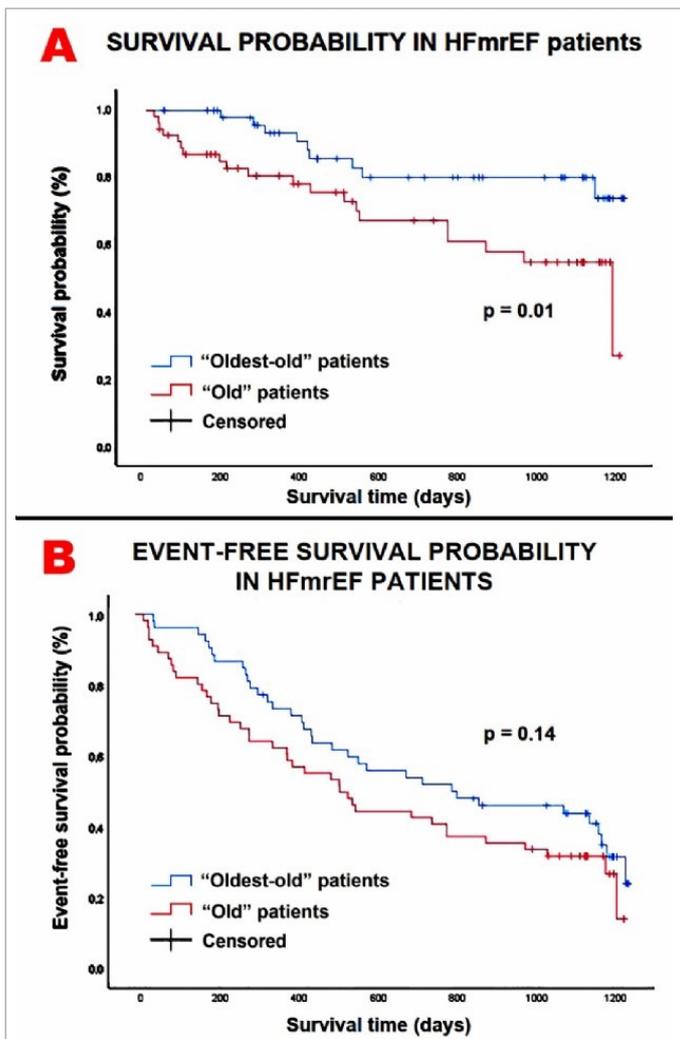


Figure 1. Kaplan-Meier curves drawn to compare the rates of the primary outcome of “all-cause mortality” (Panel A) and the secondary outcome of “all-cause mortality + rehospitalization for all causes” (Panel B) in the two HFmrEF age groups. HFmrEF, heart failure with mildly reduced ejection fraction.

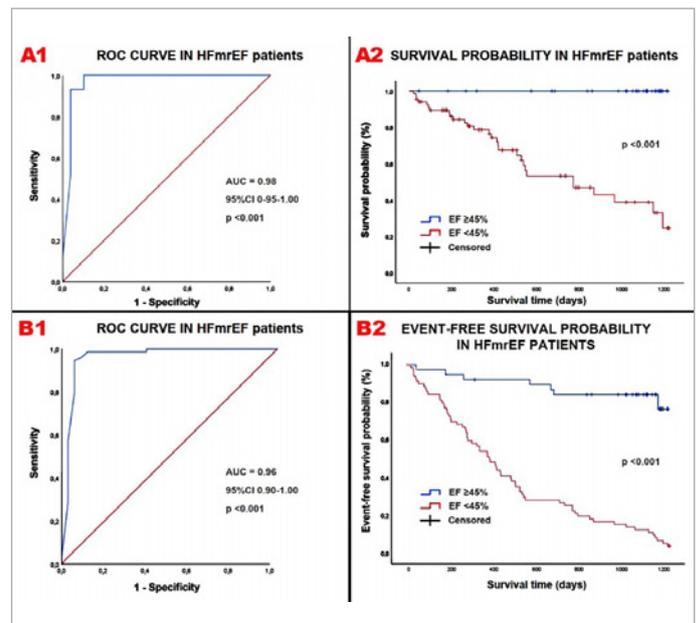


Figure 2. Prognostic ROC curves and Kaplan-Meier survival curves drawn to compare the rates of “all-cause mortality” (Panels A1 and A2) and the composite of “all-cause mortality + rehospitalization for all causes” (Panels B1 and B2) in HFmrEF patients, categorized according to EF <45% and ≥45%.

[Abstract:0449]

## TRANSTHYRETIN CARDIAC AMYLOIDOSIS: DIAGNOSTIC CHALLENGES

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**Introduction:** Amyloidosis involves the accumulation of insoluble proteins causing tissue damage. At the cardiac level the most frequent ones are the light chains and transthyretin, in their hereditary form (AhTTR) or acquired wild type (ATTRwt), with the latter being the most prevalent. This case presents a 71-year-old male diagnosed with ATTRwt.

**Case:** The patient, with a history of hypertension, hypercholesterolemia, and hyperuricemia, experienced dizziness, dyspnoea (NYHA II/IV), and right upper limb paraesthesia. Physical exams revealed cardiac hypertrophy, preserved ejection fraction, bilateral median nerve entrapment, diffuse subendocardial enhancement on cardiac MRI, and grade 3 cardiac uptake on DPD Tc 99m scan. Tests ruled out clonal components but confirmed the unmutated TTR gene. The patient was enrolled in a trial receiving Vutrisiran.

**Discussion:** ATTR’s clinical variability and diagnostic challenges have led to underdiagnosis, often confused with other heart conditions, resulting in ineffective and potentially harmful

treatments. Early suspicion is crucial due to poor prognosis in ATTR, but newer drugs like tafamidis have shown increased survival rates. Screening for ATTR is recommended based on specific criteria and “red flags.” Non-invasive diagnostic algorithms involving bone scintigraphy cardiac uptake allow diagnosis without invasive procedures.

**Conclusions:** Early suspicion is pivotal due to higher prevalence than believed, “red flags” aid in screening, and non-invasive diagnostic methods like DPD scintigraphy play a vital role.

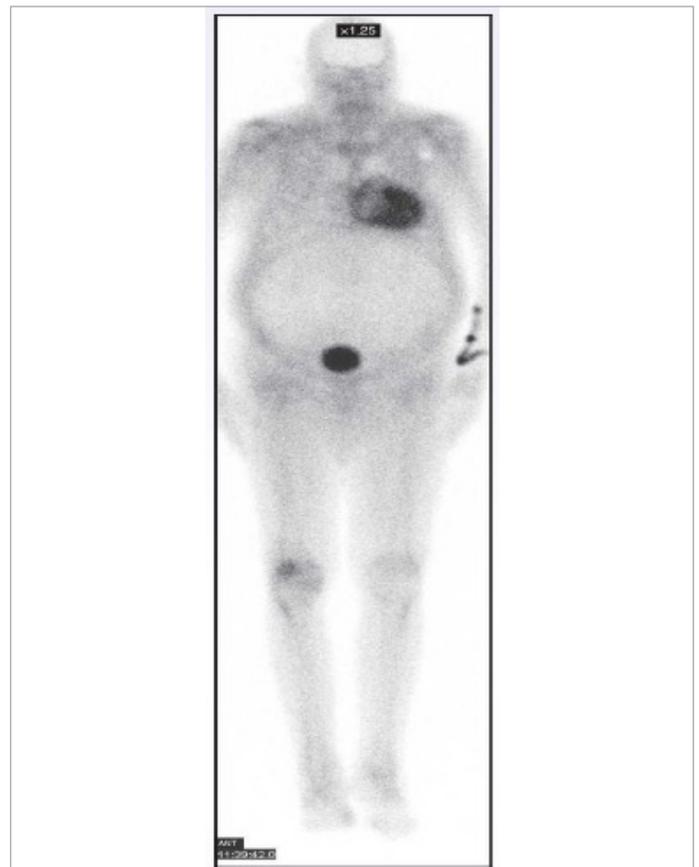
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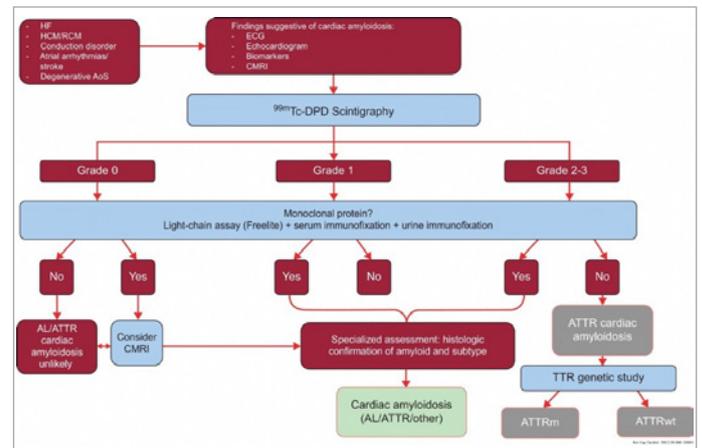
**Keywords:** transthyretin, red flags, non-invasive



**Figure 1.** 1) Rupture of the biceps tendon 2) Echocardiogram. Reduction in longitudinal strain with apical preservation on echocardiography.



**Figure 2.** Bone scintigraphy. Cardiac uptake allow diagnosis without invasive procedures.



**Figure 3.** Diagnostic algorithm.

1. Diastolic heart failure and/or aortic stenosis in individuals over 65 years old.
2. Pseudo-infarction pattern on electrocardiogram.
3. Conduction disorders: AV block, Right Bundle Branch Block.
4. Low QRS voltages (discordance with LV thickness).
5. Longitudinal strain with a typical pattern of apical preservation in echocardiography.
6. Late gadolinium enhancement in MRI.
7. Dysautonomia (orthostatic hypotension)
8. Bilateral carpal tunnel syndrome.
9. Rupture of the biceps tendon.
10. Lumbar canal stenosis.

Table 1. Red flags.

SCREENING: Left ventricular hypertrophy in echocardiography ( $\geq 12$  mm) +  $\geq 1$  Red flag.

[Abstract:0450]

## NOT ONLY TABLETS: NON-INVASIVE TRANSCUTANEOUS ELECTRONEUROSTIMULATION IN THE TREATMENT OF ARTERIAL HYPERTENSION

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**Background and Aims:** Arterial hypertension (AH) is the main modifiable risk factor for cardiovascular diseases. We aimed to assess the efficacy, safety, and duration of the effect of non-invasive transcutaneous electroneurostimulation (TENS) in patients with AH on the background of antihypertensive drug therapy (AHT).

**Methods:** We enrolled 57 patients (40 men/17 women, mean age 53.4 years) with verified diagnosis of AH in this randomized, sham-controlled trial. The patients were divided into 2 groups - active treatment with TENS once a day (group 1, 26 patients) and twice a day (group 2, 15 patients) or sham-device (control group, 16 patients) for 14 days in addition to the background AHT treatment. Analysis was carried out using 24-hours blood pressure (BP) monitoring before the start, in the end of treatment and 28 days after the start of course.

**Results:** An antihypertensive effect was observed in both TENS groups, but in group 2 effect was stronger with maximum and average systolic and diastolic BP decreased by 10 mmHg and 7 mmHg ( $p < 0,05$ ) respectively, while in group 1 the maximum and average systolic BP decreased by 6 mmHg and 6 mmHg ( $p < 0,05$ ). In the control group, the BP did not change significantly. At the final visit after the treatment, the BP level remained the same. During the treatment period, side effects of TENS were not registered.

**Conclusions:** Our results suggest that non-invasive TENS may be recommended as an adjunct to AHT medications in case of inability to reach target BP levels. The study is ongoing.

**Keywords:** arterial hypertension, antihypertensive therapy, transcutaneous electroneurostimulation

[Abstract:0454]

## PROGNOSTIC IMPACT OF INDUCED NATRIURESIS IN ACUTE DECOMPENSATED HEART FAILURE AND ITS ASSOCIATION WITH INTRAABDOMINAL PRESSURE AND OTHER CONGESTION MARKERS. A MULTIMODAL APPROACH TO CONGESTION ASSESSMENT

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**Background:** Congestion is an essential issue in patients with heart failure (HF). Standard treatments do not usually achieve decongestion, and various strategies have been proposed to guide treatment to reduce residual congestion. Some authors have previously shown that the determination of natriuresis may be helpful. After starting treatment with loop diuretics, we postulate that initial natriuresis might help treatment titration, decongestion, and improve prognosis.

**Methods:** Prospective and observational study. Patients admitted to the Internal Medicine department with the diagnosis of HF decompensation were eligible. Medical data was recorded, and an assessment of congestion was performed during the first 48 hours of admission.

**Results:** A total of 113 patients were included. A poor diuretic response (urinary sodium [NaU]  $\leq 80$  mmol) was observed in 39.8% of those patients. After the first 48 hours of admission, patients with a greater diuretic response on admission (Na  $> 80$  mmol/L) showed fewer pulmonary b lines (12 vs. 15;  $p = 0.084$ ), a lower IVC diameter (18 mm vs. 22 mm;  $p = 0.009$ ) and lower IAP figures (11 mmHg vs. 13 mmHg;  $p = 0.041$ ). Survival analysis tests demonstrated significant differences between both groups, showing a higher proportion of all-cause mortality (ACM) and HF rehospitalization in the poor diuretic response group (Log-rank test = 0.020).

**Conclusions:** Up to 40% of the patients presented a poorer diuretic response at baseline, translating into worse outcomes. Patients with an optimal diuretic response showed significantly higher abdominal decongestion (through IAP reduction) at 48 hours and a better prognosis regarding ACM and/or HF rehospitalizations.

**Keywords:** heart failure, congestion, natriuresis

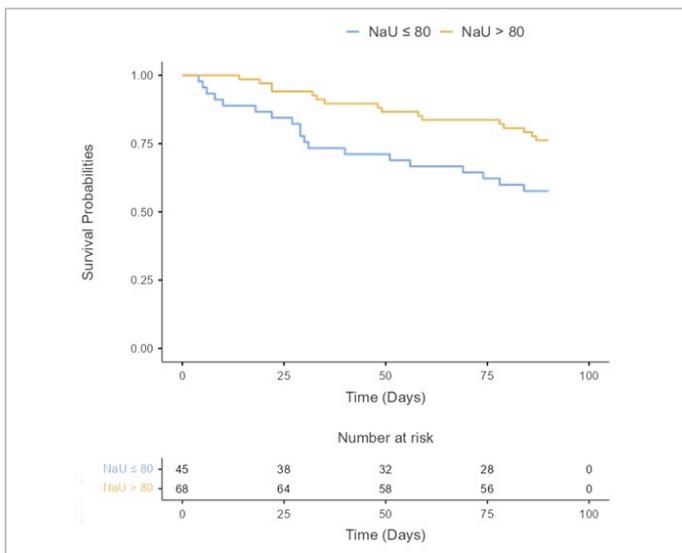


Figure 1. All-cause mortality and/or HF rehospitalization during 90 days after discharge according to baseline urinary sodium concentrations.

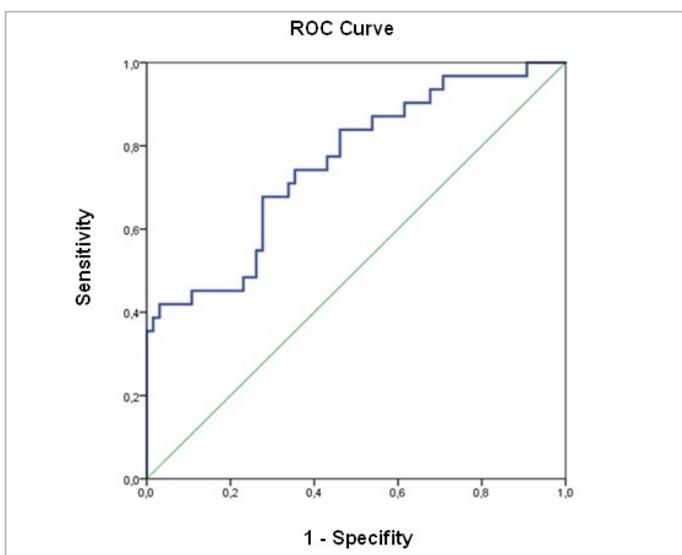


Figure 2. ROC curve for the multivariable Cox regression model.

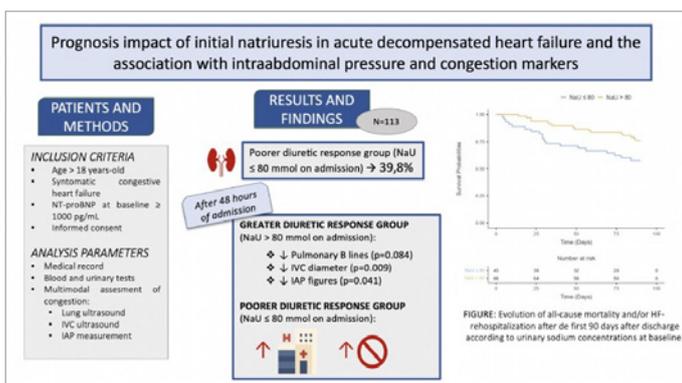


Figure 3. Graphic abstract.

[Abstract:0455]

## VEXUS BEDSIDE PROTOCOL: PROSPECTIVE STUDY OF THE MULTIMODAL CONGESTION ASSESSMENT IN PATIENTS ADMITTED TO A TERTIARY HOSPITAL FOR DECOMPENSATED HEART FAILURE

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**Background:** The VExUS (Venous excess ultrasound grading system) protocol analyses the inferior vena cava (IVC) and pulsed Doppler in three abdominal veins: suprahepatic, portal and lobar renal veins. It emerges in the cardio-renal field as a non-invasive examination that allows identifying those patients with worse prognosis.

**Methods:** Prospective, observational, and single-center cohort study in acute heart failure patients admitted at the Internal Medicine Department from November 2022 to July 2023. Clinical, ultrasound and analytical congestion parameters were evaluated upon admission.

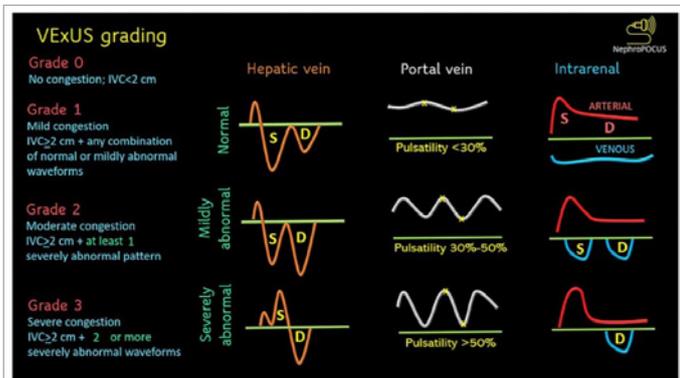
**Results:** A total of 62 patients were included. Clinical congestion measured in the physical exam (p<0.001) and particularly, the severity of tissue oedema (p=0.001) are related to congestion evaluated by the VExUS protocol. Furthermore, there is a relationship between the diameter of the IVC (p<0.001) and collapse <50% of the IVC (p=0.015). The VExUS grade, ascites (p<0.001) and the elevation of the tissue biomarker CA 125 (p=0.025) are correlated, being these patients the ones which presented worse diuretic response measured with decreased natriuresis (p=0.045) and required greater dose of intravenous diuretic (p=0.009). However, readmissions and mortality at three months have not shown a relationship with VExUS.

**Conclusions:** The VExUS protocol upon admission allows us to identify patients with greater clinical congestion, less natriuresis, and those who require higher doses of intravenous diuretic. The presence of ascites and elevation of the tissue biomarker CA125 are associated with a higher VExUS grade. Nonetheless, the usefulness of VExUS as a medium-term predictor of readmissions and mortality has not been confirmed in this study.

**Keywords:** heart failure, VExUS, congestion, cardiorenal syndrome, CA125, natriuresis.

Edemas	0.001	Natriuresis	0.045
Congestion score (0-8)	<0.001	Ca 125	0.025
Ascitis	<0.001	Transferrin saturation Index (%)	0.017
Inferior vena cava collapse <50%	0.015	Total intravenous furosemide (mg)	0.009
Inferior vena cava diameter	<0.001	First 48h intravenous furosemide dose (mg)	0.026

**Table 1.** Clinical, ultrasound, and analytical variables and regarding treatment implemented significantly according to the VExUS grade at admission.



**Figure 1.** VExUS grading.

[Abstract:0456]

## D-DIMER AND PROCALCITONIN IN PATIENTS WITH ACUTE RECURRENT PERICARDITIS

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**Introduction:** Recurrent pericarditis is an inflammatory syndrome, whose pathogenesis is not completely understood and that sometimes poses difficult differential diagnoses. Patients and **Methods:** We enrolled and analysed 412 patients with idiopathic recurrent pericarditis in a prospectively maintained registry in our referral centre in the period between 2019 and 2023. The aim of this study is to evaluate the correlation of elevated levels of D-Dimer (D-D) and procalcitonin (PCT) with clinical, laboratory and imaging features in patients with recurrent idiopathic pericarditis.

**Results:** Regarding clinical aspects, none of these patients had venous thromboembolism and increased D-D was associated with presence of pleural effusion and with fever equal to or greater than 37.5°C.

Regarding laboratory parameters, patients with elevated D-D values showed higher CRP levels, higher white blood cell and neutrophil counts, both absolute and relative. Furthermore, relative lymphocyte counts were reduced in these patients.

Using multivariate analysis, only presence of fever, regardless of other variables, was correlated with D-D elevation. PCT elevation, that was rare and marginal, did not correlate with any variables.

**Conclusions:** In idiopathic recurrent pericarditis, in absence of other specific conditions (e.g., venous thromboembolism, aortic dissection or neoplasms), we observed high D-D values, aspecifically related with the intensity of inflammation (CRP and neutrophil leukocytosis). PCT was normal or rarely mildly elevated, underlying the fact that elevated CRP and neutrophil leukocytosis is not sustained by bacterial infections in this context, but probably by activation of IL-1.

**Keywords:** pericarditis, D-dimer, procalcitonin, inflammation, IL-1 pathway

Quantitative variables during attack	Elevated D-dimer (n = 33)	Normal D-dimer (n = 15)	p-value
White blood cells [f/ml]	11432 (9350 - 13005)	8160 (6049 - 9800)	0.005
Absolute neutrophil count [f/ml]	8954 (6412 - 10400)	5712 (4080 - 6720)	0.007
Relative neutrophil count [%]	78.7 (70 - 80)	70 (67.35 - 73)	0.036
Absolute lymphocyte count [f/ml]	1716 (1605 - 1985)	1650 (1270 - 2000)	0.280
Relative lymphocyte count [%]	16 (13 - 20)	20.41 (20 - 21)	0.013
Neutrophil-to-lymphocyte ratio	4.88 (3.38 - 6.15)	3.48 (3.30 - 3.50)	0.062
C-reactive protein, CRP [mg/l]	120 (20.50 - 204.50)	3 (0 - 40)	< 0.001

**Table 1.** Laboratory characteristics and difference between elevated and normal D-dimer.

Qualitative variables during attack	Elevated D-dimer (n = 33)	Normal D-dimer (n = 15)	Odds ratio (95%CI)	p-value
Pericardial effusion	27 (56.3)	13 (27.1)	0.68 (0.12 - 3.91)	0.677
Pleural involvement	18 (37.5)	1 (2.1)	16.80 (1.97 - 142.98)	0.010
Peritoneal involvement	1 (2.1)	0 (0)	0.97 (0.08 - 11.51)	0.981
Fever TC > 37.5°C	24 (50)	1 (2.1)	37.33 (4.27 - 326.51)	0.001

**Table 2.** Clinical characteristics in elevated and normal D-dimer groups.

[Abstract:0464]

## “MACHINE LEARNING INSIGHTS INTO CODETERMINANTS OF URIC ACID INCREASE INDUCED BY THIAZIDE/THIAZIDE-LIKE DIURETICS

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**Background:** Serum uric acid, associated with cardiovascular conditions such as atherosclerotic heart disease and hypertension, can be elevated by thiazide or thiazide-like drugs (THZ), essential in hypertension management. Identifying clinical determinants affecting THZ-related uric acid elevation is critical.

**Methods:** In this retrospective cross-sectional study, we explored the clinical determinants influencing uric acid elevation related to THZ, focusing on patients where THZ was initiated, or the dose escalated. A cohort of 143 patients was analysed, collecting baseline and control uric acid levels, alongside basic biochemical studies and clinical data. Feature selection was conducted utilizing criteria based on mean squared error increase and enhancement in node purity. Four machine learning algorithms—Random Forest, Neural Network, Support Vector Machine, and Gradient Boosting regressions—were applied to pinpoint clinical influencers.

**Results:** Significant features include uncontrolled diabetes, index eGFR level, absence of insulin, action of indapamide, and absence of statin treatment, with absence of SGLT2 inhibitors, low dose aspirin exposure, and older age also being noteworthy. Among the applied models, the Gradient Boosting regression model outperformed the others, exhibiting the lowest MAE, MSE, RMSE values, and the highest R2 value (0.779). While Random Forest and Neural Network regression models were able to fit the data adequately, the Support Vector Machine demonstrated inferior metrics.

**Conclusions:** Machine Learning Algorithms can precisely predict THZ-related uric acid changes, facilitating optimized therapy tailoring, minimizing unnecessary THZ abstinence, and guiding to prevent usage in cases where uric acid levels might reach undesirable levels.

**Keywords:** Hypertension, Hyperuricemia, Machine Learning, Thiazides, Indapamide, Hydrochlorothiazide

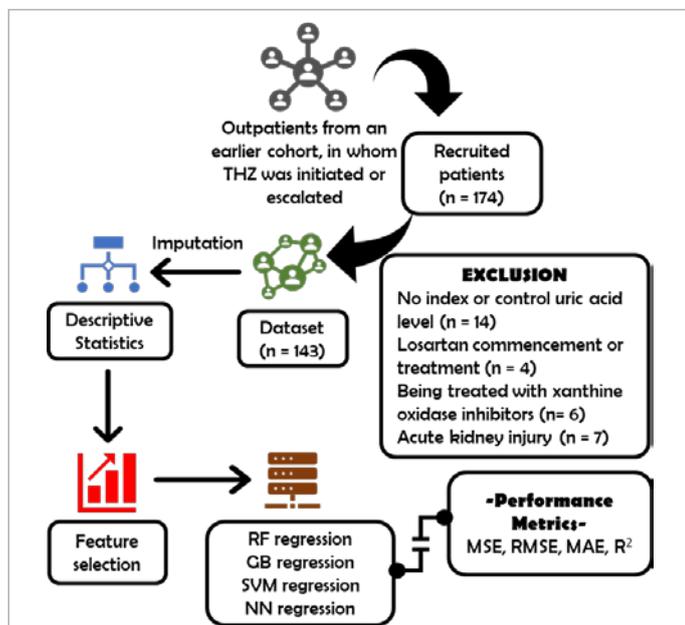


Figure 1. Flowchart of the study.

Abbr: GB: Gradient Boosting, RF: Random Forest, SVM: Support Vector Machine NN: Neural Network.

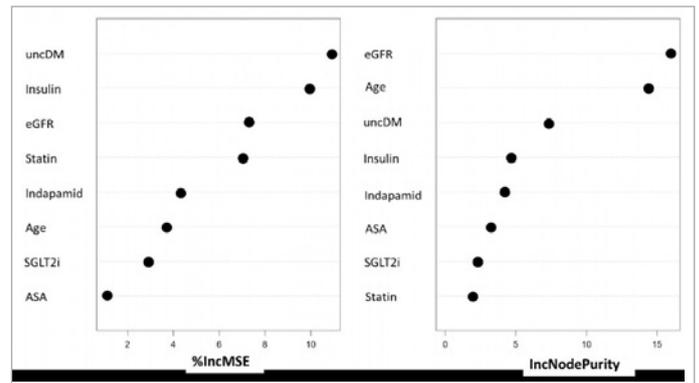


Figure 2. The eight most important features contributing the  $\Delta$ uric acid slope:

Abbr: unCDM; uncontrolled Diabetes, eGFR; estimated Glomerular Filtration Rate, SGLT2i; Sodium Glucose co-Transporter-2 inhibitors, ASA; Acetyl salicylic acid, %IncMSE; Percent Increase in Mean Squared Error, IncNodePurity; Increase in Node Purity. Four ML algorithms were employed to ascertain the best fits to the dataset (table 4). The GBreg model surpassed the others, exhibiting the lowest MAE, MSE, RMSE values, and the highest R2 value (0.779). The least effective performance was noted in the SVM model ( $R^2 = 0.279$ ). Random forest regression ranked third ( $R^2 = 0.494$ ), while the NNreg approach was nearly aligned with the GBreg algorithm in evaluating each feature ( $R^2 = 0.57$ ). This evaluation considered increases in mean squared error and improvements in node purity.

[Abstract:0479]

## HEART IN FOCUS: PERICARDIAL EFFUSION DIAGNOSIS AND MANAGEMENT WITH POCUS

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**Summary:** Pericardial effusion (PEF) refers to the accumulation of fluid within the pericardial sac. It can be caused by various medical conditions and may lead to serious complications if not diagnosed and managed promptly. Point-of-care ultrasound (POCUS) has emerged as a valuable tool in the clinical evaluation of pericardial effusions, offering real-time visualization and aiding in the assessment of its size, characteristics, and potential hemodynamic impact.

**Purpose:** This qualitative review explores the utility of POCUS and proposes a practical approach for the diagnosis and management of PEFs.

**Methods:** A comprehensive search was conducted on PubMed.

The search strategy involved using the keywords “POCUS” and “pericardial” as MeSH terms, and reference mining. Publications of the last ten years (August 2013-2023) were included, and thirteen out of sixteen articles were selected. Animal and paediatric studies were excluded.

**Results and Discussion:** Characterization and quantification of PEF may provide the clinician with clues regarding the etiologic diagnosis that, in addition to other hemodynamic parameters, can guide subsequent management. By establishing a clinical correlation between the patient’s symptoms and the sonographic findings, we propose a diagnostic and management algorithm to exclude the need of an urgent pericardiocentesis, while improving mortality and morbidity of cardiac tamponade.

**Conclusions:** POCUS has revolutionized the clinical evaluation of PEFs, providing clinicians with a rapid and accurate bedside tool for diagnosis and management. Its ability to assess and continuously monitor effusion size, signs of cardiac tamponade and guide pericardiocentesis procedures has proven invaluable in improving patient outcomes.

**Keywords:** POCUS, pleural effusion, I-AIM model, cardiac tamponade

[Abstract:0491]

## ECG, AN ALLY IN THE APPROACH TO CHEST PAIN

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The ECG is an inexpensive, easy-to-use, safe, and useful diagnostic tool. It is particularly useful in patients with chest pain.

We present a 44-year-old female patient with vascular risk factors (uncontrolled hypertension, untreated hypertriglyceridemia, active smoking, and obesity). She presented to the emergency department with syncope on defecation followed by anginal chest pain. On admission, she was found to have hypertension, bradycardia, and no signs of heart failure. The ECG showed sinus bradycardia, mild ST segment elevation in DII, III and aVF, and an inverted T wave in V1 to V3.

Analysis revealed elevated troponin levels consistent with acute coronary syndrome. Pain resolved without medication and ECG normalized. Echocardiogram showed straightened interventricular septum, reduced right ventricular (RV) systolic function, and global hypokinesia with McConnell’s sign. Pulmonary thromboembolism was excluded.

Urgent cardiac catheterization revealed a subacute thrombotic occlusion of the right middle coronary artery, and she underwent angioplasty with a good final result. Right ventricular myocardial infarction was suspected, with evolution to Killip I. RV function recovered, but segmental changes remained.

Thrombotic causes such as antiphospholipid syndrome were

excluded. Thus, in a patient with multiple uncontrolled vascular risk factors, myocardial infarction caused by atherosclerosis was assumed.

Isolated RV infarction is a rare event. Only 25% of patients present with clinical symptoms, usually hypotension and elevated jugular venous pressure. The present case shows a non-typical presentation in which the electrocardiogram and the correct treatment were essential for a rapid and favourable outcome.

**Keywords:** ECG, chest pain, myocardial infarction

[Abstract:0523]

## ASSOCIATION BETWEEN TRAJECTORIES OF ALBUMINURIA AND URINARY IONS IN PATIENTS WITH ACUTE HEART FAILURE

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**Purpose:** To analyse the trajectory of albuminuria during acute heart failure admission and its association with the trajectory of urinary ions.

**Methods:** This clinical study is a single-centre, prospective, observational study of acute heart failure patients. Urine albumin-creatinine ratio (UACR), urinary sodium and urinary chloride are assessed at admission and discharge, alongside other clinical and biochemical variables.

The primary endpoint is to analyse UACR trajectory and its association with the longitudinal trajectory of urinary sodium and urinary chloride. Changes in continuous endpoints and their longitudinal trajectories were estimated with linear mixed regression models.

**Findings:** Sixty-three patients, median age 87, 68.5% women, 69.8% with preserved ejection fraction. The UACR trajectory notably decreased, with a 50% reduction in macroalbuminuria patients from admission to discharge. An association was observed between the UACR trajectory and urinary ions trajectory; patients with greater reductions in urinary chloride and urinary sodium had larger UACR reductions with an interaction p value of 0.025 and 0.052, respectively.

**Discussion:** This study shows that elderly patients with acute heart failure and volume overload have significantly reduced UACR levels at discharge. Our findings complement prior studies identifying UACR as a congestion marker. Furthermore, its trajectory, combined with urinary ions, could aid in the diuretic therapy down titration.

**Conclusions:** In a cohort of elderly patients hospitalized for acute heart failure, we observed a reduction in albuminuria from admission to discharge. This reduction was associated with the reduction in urinary chloride and sodium during decongestive treatment.

**Keywords:** acute heart failure, albuminuria, urinary sodium, urinary chloride

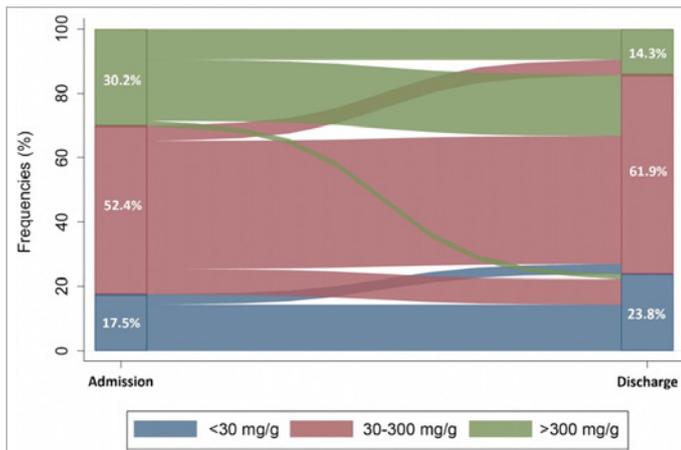


Figure 1. Trajectory of albuminuria.

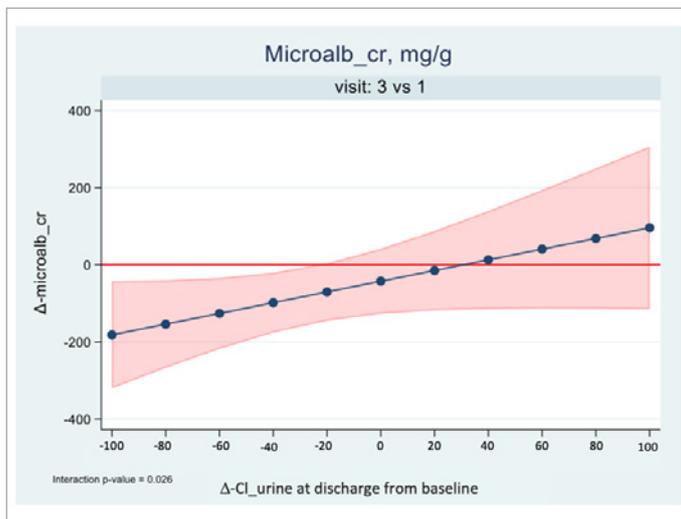


Figure 2. UACR / urinary chloride.

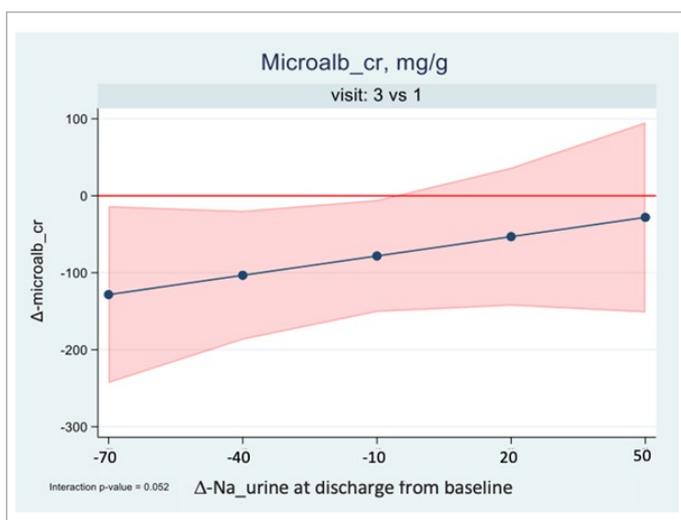


Figure 3. UACR / urinary sodium.

Age	87 (84-90)
Women, n (%)	43 (68.5)
PERSONAL HISTORY	
Hypertension, n (%)	56 (88.9)
Diabetes mellitus, n (%)	23 (36.5)
Chronic heart failure, n (%)	44 (69.8)
Atrial fibrillation, n (%)	41 (65)
Chronic kidney disease, n (%)	40 (63.5)
COPD, n (%)	13 (20.6)
CHRONIC TREATMENT	
ACEi/ARB/ARNi, n (%)	24 (38)
Beta-blockers, n (%)	38 (60.3)
Loop diuretics, n (%)	50 (79.4)
MRA, n (%)	MRA, n (%)
SGLT2i, n (%)	23 (36.5)
CLINICAL PRESENTATION	
NYHA I/II/III/IV	4 (6.3%) / 35 (55.6%) / 23 (36.5%) / 1 (1.6%)
Dyspnoea, n (%)	46 (73)
Jugular ingurgitation, n (%)	28 (44.4)
Orthopnoea, n (%)	46 (73)
Crackles, n (%)	38 (60.3)
Oedema, n (%)	40 (63.5)

Table 1. Basal variables (n=63).

ECHOCARDIOGRAPHY	
Left ventricular ejection fraction, %	59.4 (48.5-65)
Preserved ejection fraction, %	44 (69.8)
LA volume, ml/m <sup>2</sup>	46,4 (20,1)
Inferior vena cava >20 mm, n (%)	33 (52.4)
Ultrasound B lines, n (%)	29 (46)
Pleural effusion, n (%)	36 (57.1)
LABORATORY	
Haemoglobin, g/dL	12.1 (10.7-13.6)
Haematocrit, %	38.4 (33.9-42.2)
Plasma sodium, mmol/L	138 (136-141)
Plasma potassium, mmol/L	4.3 (3.9-4.7)
Urea, mg/dL	68 (53-101)
Creatinine, mg/dL	1.3 (0.9-1.6)
eGFR, ml/min/1.73m <sup>2</sup>	44 (33.2-62.3)
BNP, pg/mL	772.5 (396-1233)
CA125, U/mL	45.3 (22.8-112.9)
UACR, mg/g	108.3 (34.5-247.7)
Urinary sodium, mEq/L	71 (35-103)
Urinary chloride, mEq/L	62 (36-92)

Table 2. Echocardiography and laboratory (n=63).

[Abstract:0569]

## A RARE CASE OF PERSISTENT RESPIRATORY FAILURE

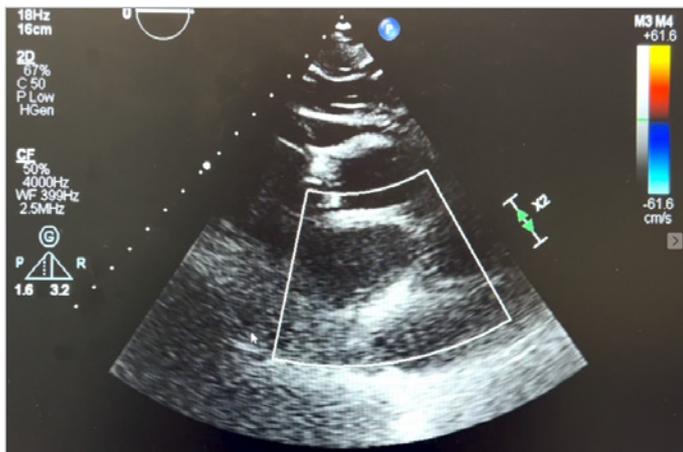
Beatriz Simão Parreira, Adriana Luísa Costa, Joana Mota, Marta Soares Carreira, Jorge Almeida

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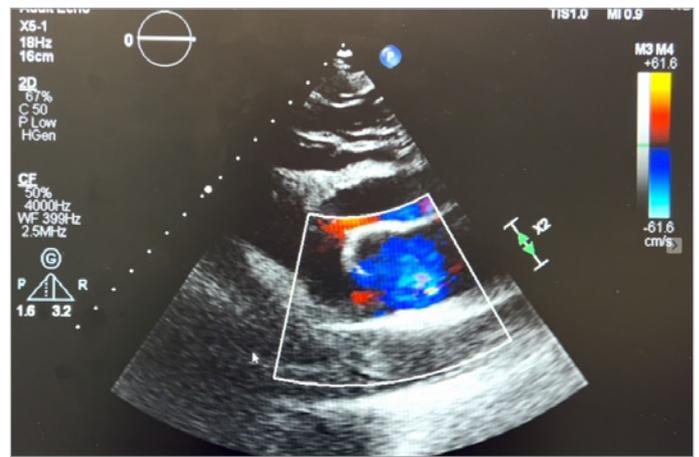
A 75-year-old female patient with a history of hypertension and cardioembolic stroke was admitted to the emergency department due to sudden onset dyspnoea and later to the intensive care unit (ICU) due to rapidly progressive hypoxemic respiratory failure (HRF) of undetermined aetiology, with a PaO<sub>2</sub>/FiO<sub>2</sub>

ratio 98, requiring high-flow oxygen therapy. While in the ICU, a chest CT scan was performed which raised the suspicion of interstitial lung disease and the patient underwent three days of prednisolone (40 mg/day). After stabilization and transfer to the Internal Medicine ward, the patient presented with persistent HRF and severe platypnea-orthodeoxia while sitting. In light of the previous history of cardioembolic stroke, absence of liver disease and imaging ruling out pulmonary vascular malformations and embolism, the suspicion of patent foramen ovale (PFO) was raised. The patient underwent a transthoracic echocardiogram with agitated saline which showed a right-to-left intra-atrial shunt at rest and a transoesophageal echocardiogram which showed a large PFO with a continuous right-to-left shunt. Given the clinical severity, the patient underwent PFO percutaneous closure, after which she progressed with complete resolution of the platypnea-orthodeoxia and respiratory failure. This clinical case demonstrates the importance of medical semiology and anamnesis, since the platypnea-orthodeoxia syndrome is a rare clinical diagnosis that requires a high level of suspicion to be recognized and, when due to PFO, can be promptly corrected.

**Keywords:** patent foramen ovale, platypnea orthodeoxia syndrome, dyspnea



**Figure 1.** Transthoracic echocardiogram. Thin fossa ovalis membrane with slight aneurysm, bulging to the left, patent foramen ovale in anterior / para-aortic location in tunnel.



**Figure 2.** Transthoracic echocardiogram. Patent foramen ovale with continuous right-left shunt, visible by colour doppler and with passage of a large quantity of bubbles after administration of agitated saline through the forearm vein.

[Abstract:0575]

## REMEMBERING PROSTHETIC VALVE DYSFUNCTIONS

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**Introduction:** Prosthetic heart valve may be subject to potential complications and dysfunction. The authors present a case of a mechanical mitral valve prosthetic dysfunction due to pannus.

**Case:** Woman, 43 years-old, with prior history of infective endocarditis of the mitral valve (native) requiring valve replacement, at the time presenting severe insufficiency and signs of infectious infiltration in both valve leaflets. At that point, antibiotic therapy has been performed with ampicillin and flucloxacillin. No specific agent had been identified. A double-disc mechanical valve prosthesis was implanted in the mitral position, and the patient was anticoagulated with a warfarin. About a year after the intervention, she presented fatigue and heart failure. On transthoracic echocardiography, findings included a preserved left ventricular ejection fraction and a normally inserted mechanical prosthetic heart valve in the mitral position with prosthetic dysfunction due to a fixed disc in a closed position. Given the overall clinical context, fluoroscopy was performed which demonstrated immobility of one of the discs (1). Computed tomography angiography was performed, showing

normal positioning of the mechanical valve with evidence of immobility of an occluding disc with irregular periannular thickening, compatible with prosthetic dysfunction. This latter finding was also observed during the intraoperative period on transoesophageal echocardiography (2). The patient underwent re-intervention, with replacement of the mechanical heart valve by a biological heart valve prosthesis. The surgical intervention and subsequent hospitalization were uneventful, and the patient was subsequently discharged for further follow-up.

**Conclusions:** prosthetic valve dysfunction is an uncommon occurrence, which can have a substantial impact in terms of morbidity and mortality. The use of a comprehensive strategy is essential for the adequate management of these complex cases.

**Keywords:** prosthetic dysfunctions, pannus, endocarditis

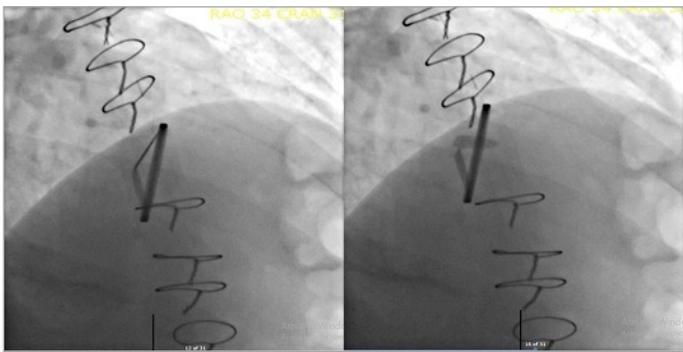


Figure 1. Fluoroscopy with evidence of immobility of one of the discs of the mitral valve prosthesis.

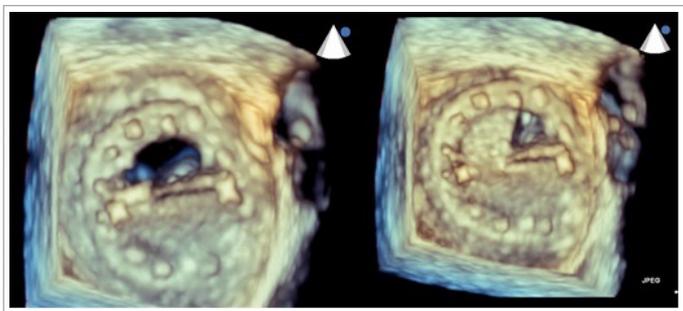


Figure 2. Tridimensional reconstruction during transoesophageal echocardiography, showing prosthetic dysfunction.

[Abstract:0615]

## BEYOND THE ECG: — A COMPELLING CASE OF TAKOTSUBO CARDIOMYOPATHY CAMOUFLAGED AS STEMI

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Takotsubo cardiomyopathy (TTC) or “broken heart syndrome,” was documented in 1983 among Japanese females. This cardiac condition primarily affects postmenopausal women, typically triggered by stress. Estimated to contribute to 1–2%

of suspected heart attacks, its true prevalence is uncertain due to underdiagnosis. While only 10% occur in men, the majority affects postmenopausal women aged 65–70. There’s a notable predisposition for TTC in postmenopausal women, though males may experience a more severe prognosis if affected. Despite extensive research, the exact pathogenesis of TTC remains elusive, with proposed theories including catecholamine cardiotoxicity, coronary artery spasm, coronary microvascular impairment, and oestrogen deficiency. Presented is a case of a 74-year-old woman with no prior cardiac history, admitted with chest pain and cold sweating. An electrocardiogram revealed ST-segment elevation and elevated troponin serum levels were noted. Cardiac catheterization revealed no related obstructive coronary lesions, but evidence of highly restricted LV-EF and sparing the basal segments with apical ballooning, characteristic of TTC. A stressor precipitant was subsequently identified, leading to the diagnosis of TTC. The case report details clinical presentation, diagnostics, and therapeutic approaches, aiming to enhance awareness of this underrecognized cardiac condition.

Ahmad SA, Brito D, Khalid N, et al. Takotsubo Cardiomyopathy. [Updated 2023 May] Treasure Island (FL): StatPearls Publishing; 2023 Jan

Khalid N, Ahmad SA, Shlofmitz E, Chhabra L. Pathophysiology of Takotsubo Syndrome. 2023 Mar 6 Treasure Island (FL): StatPearls Publishing; 2023 JanGutiérrez, V. C. (12.05.2016). Takotsubo cardiomyopathy: a case-report. Revista Médica Del Hospital General De México, Volume 81,(Supplement 1, 2018), 41-46

**Keywords:** STEMI, stress, apical ballooning, Takotsubo cardiomyopathy, chest pain, broken heart syndrom

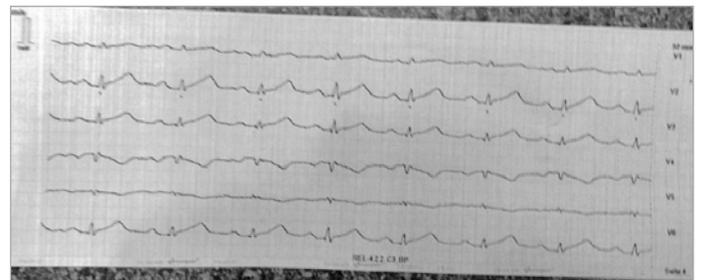


Figure 1. ECG in ambulance.

In the presented case, the electrocardiogram (ECG) of the patient, recorded in the ambulance, reveals conspicuous ST-elevations in derivations II, III, aVF, as well as between V2 and V6.

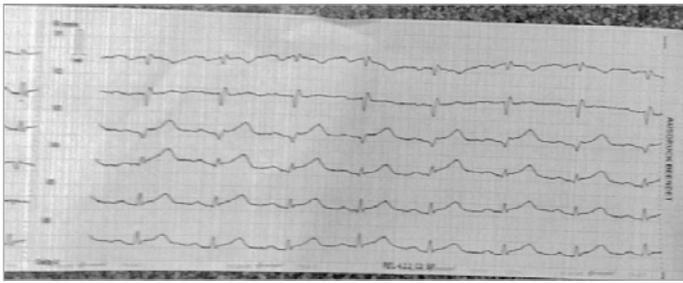


Figure 2. ECG in ambulance.

In the presented case, the electrocardiogram (ECG) of the patient, recorded in the ambulance, reveals conspicuous ST-elevations in derivations II, III, aVF, as well as between V2 and V6.

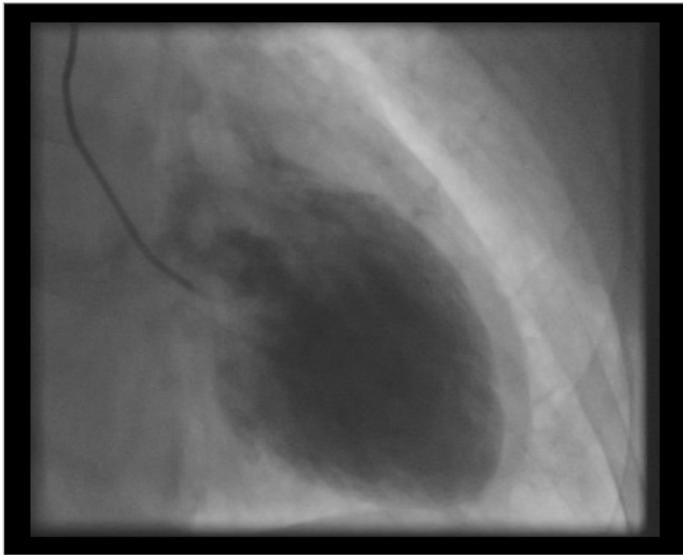


Figure 3. Apical ballooning in cardiac catheterization.

The image reveals characteristic apical ballooning, indicative of Takotsubo cardiomyopathy, as observed during the emergency angiography conducted in this case.



Figure 4. An example from angiography.

[Abstract:0644]

## ASSOCIATION BETWEEN MECHANICAL DYSSYNCHRONY AND MYOCARDIAL BLOOD FLOW RESERVE IN PATIENTS WITH NONOBSTRUCTIVE CORONARY ARTERY DISEASE: DOES TIME TO STRESS TEST MATTER?

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**Purpose:** To assess the association between SPECT derived mechanical dyssynchrony (MD) and presence of microvascular dysfunction.

**Methods:** 30 patients (suspected coronary artery disease, preserved LVEF, nonobstructive CAD) were included. All patients underwent gated dynamic myocardial SPECT (dSPECT) with <sup>99m</sup>Tc-MIBI (rest and adenosine stress test, list mode) and routine gated myocardial perfusion SPECT 60 minutes after the administration of the radiopharmaceutical. From the dSPECT data myocardial flow reserve (MFR) and MD - phase histogram standard deviation (PSD, deg.) and phase histogram bandwidth (HBW, deg.) from 240 seconds after injection of radiopharmaceutical were obtained. From delayed images, similar MD indices were obtained. Based on MFR data, patients were divided into 2 groups: with preserved (pMFR, MFR ≥ 2.0) and reduced (rMFR, MFR < 2.0) MFR.

**Findings:** Both groups included 15 patients. Early stress MD was significantly higher in rMFR (PSD  $p=0.01$ ; HBW  $p=0.02$ ). At delayed scan, only HBW showed significant differences ( $p=0.003$ ). Correlation analysis showed that early stress MD had a stronger correlation with MFR (PSD  $p=-0.68$ ,  $p<0.0001$ ; HBW  $p=-0.61$ ,  $p=0.0001$ ) compared with delayed scan (PSD  $p=-0.37$ ,  $p=0.01$ ; HBW  $p=-0.44$ ,  $p=0.005$ ). Early stress PSD was the only independent predictor of a decreased MFR (OR 1.29 (1.1; 1.53),  $p<0.001$ ). Early stress PSD >22deg. had a sensitivity of 75% and a specificity of 100% (AUC=0.86,  $p<0.001$ ) in predicting the reduced MFR.

**Conclusions:** Early stress MD indices have a stronger association with SPECT derived MFR. The most significant association with reduced MFR has early stress PSD.

**Keywords:** microvascular dysfunction, SPECT, mechanical dyssynchrony, stress

[Abstract:0695]

## PERICARDITIS IN ELDERLY PATIENTS: CLINICAL AND LABORATORY CHARACTERISTICS AND ACCESS TO CONVENTIONAL THERAPIES

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**Background:** In the literature, data regarding acute and recurrent pericarditis in the elderly population, frequently with various comorbidities and treated with different drugs, are extremely limited and the ESC guidelines provide limited data on the management and therapy of pericarditis in patients over 65.

**Materials and Methods:** This is international multicentre observational study of a cohort of 275 outpatients (133 elderly, 142 young) with idiopathic recurrent pericarditis from 8 European centres, subdivided in two groups (over and under 65). The primary objectives consist of evaluating the clinical and laboratory characteristics at presentation and any differences between elderly and young populations.

**Results:** Regarding the clinical presentation, elderly patients have more often dyspnoea while chest pain and fever prevail in young people. Pleural involvement and severe pericardial effusion with a need for pericardiocentesis are more frequent in over 65 patients. Regarding the laboratory data at onset, leukocytes are higher in young patients. Regarding therapy, NSAIDs, colchicine and Anakinra are used less in the elderly than in the young, while corticosteroids are used more in over 65. The multivariate analysis confirms the prevalent symptoms and use of steroids and colchicine as independent factors that differ in these two groups.

**Conclusions:** We identified a difference on clinical and laboratory characteristics of pericardial disease between under and over 65 years patients, useful for diagnosis, prognosis, and treatment. Further work will be necessary to confirm what has been observed in the present study.

**Keywords:** pericarditis, elderly patients, multimorbidity, polytherapy

Clinical characteristics	Young (N=142)	Elderly (N=133)	Odds ratio (95% CI)	p-value
<b>Diagnosis</b>				0.700
• IRP	126 (88.7)	116 (87.2)		
• PCIS	16 (11.3)	17 (12.8)		
<b>Prevalent symptoms</b>				< 0.001
• Dyspnoea	15 (10.6)	72 (54.1)	9.99 (5.30 – 18.85)	< 0.001
• Chest pain	114 (80.3)	43 (32.3)	0.12 (0.07 – 0.20)	< 0.001
• Both	13 (9.2)	18 (13.5)	1.55 (0.73 – 3.31)	0.254
Fever TC > 38°C	76 (53.5)	76 (53.5)	0.44 (0.27 to 0.72)	0.001
Pericardial effusion	119 (83.8)	120 (90.2)	1.78 (0.86 to 3.69)	0.118
<b>Grade of pericardial effusion</b>				
• Mild (< 10 mm)	58 (40.8)	35 (26.3)	0.52 (0.31 – 0.86)	0.011
• Moderate (10-20 mm)	43 (30.3)	43 (30.3)	1.53 (0.93 – 2.51)	0.097
• Severe (> 20 mm)	18 (12.7)	32 (24.1)	2.18 (1.16 – 4.12)	0.016
Pleural involvement	49 (34.5)	74 (55.6)	2.38 (1.46 to 3.87)	< 0.001
Peritoneal involvement	10 (7.0)	11 (8.3)	1.19 (0.49 to 2.90)	0.702
Need for pericardiocentesis	12 (8.5)	22 (16.5)	2.15 (1.02 to 4.53)	0.042
<b>Therapies</b>				
• NSAIDs	114 (80.3)	85 (63.9)	0.44 (0.25 to 0.75)	0.003
• Colchicine	124 (87.3)	102 (76.7)	0.48 (0.25 to 0.90)	0.023
• Steroids	38 (26.8)	66 (49.6)	2.70 (1.63 to 4.46)	< 0.001
• Anakinra	34 (23.9)	19 (14.3)	0.53 (0.28 to 0.98)	0.044
<b>Number of recurrences</b>				
• Absence	15 (10.6)	12 (9.0)	0.84 (0.38 – 1.87)	0.668
• 1 recurrence	23 (16.2)	33 (24.8)	1.71 (0.94 – 3.10)	0.078
• 2 recurrences	32 (22.5)	34 (25.6)	1.18 (0.68 – 2.05)	0.557
• 3 recurrences	30 (21.1)	35 (26.3)	1.33 (0.76 – 2.33)	0.312
• Four or more recurrences	42 (29.6)	19 (14.3)	0.40 (0.22 – 0.73)	0.003

Table 1. Clinical characteristics of elderly and young patients. Expressed as frequencies (percentage).

Laboratory findings	Young (N=142)	Elderly (N=133)	Differences (95% CI)	p-value
Leukocytes at onset [ $/mm^3$ ]	11208 (285)	10227 (289)	981 (185 to 1777)	0.016
Neutrophils at onset [ $/mm^3$ ]	8325 (272)	7611 (295)	713 (-73 to 1500)	0.076
Lymphocytes at onset [ $/mm^3$ ]	1759 (65)	1666 (90)	92 (-127 to 312)	0.409
CRP max [mg/L]	100.15 (7.40)	92.72 (6.65)	7.43 (-12.07 to 26.93)	0.457

Table 2. Laboratory characteristics and difference between elderly and young patients. Expressed as mean value (standard error).

[Abstract:0697]

## A CUTANEOUS PREDICTOR OF CORONARY ARTERY DISEASE

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**Summary:** Frank's sign or diagonal earlobe crease (DELC), first described in 1973, has gained recognition as an important clinical indicator of underlying coronary artery disease.

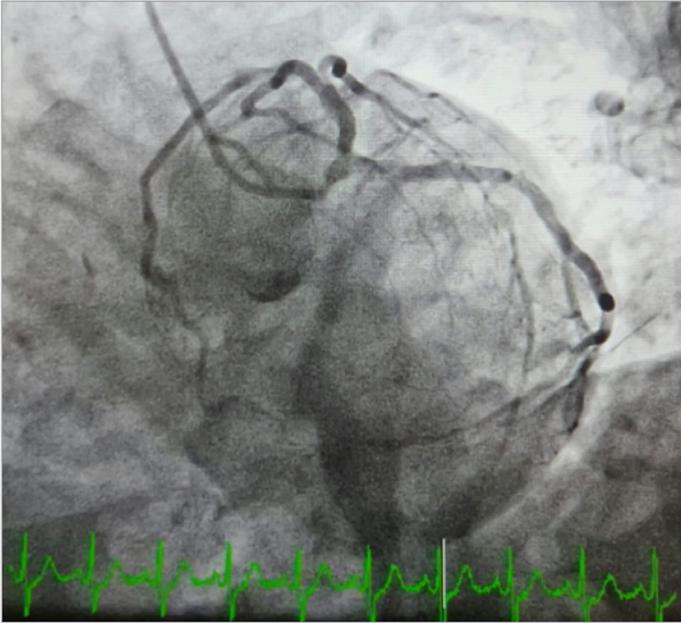
The main postulated mechanism is free radical oxidative stress, involved in both atherogenesis and skin damage. There is an association of DELC with carotid intima-media thickness and arterial stiffness, markers of subclinical atherosclerosis.

**Case:** A 71-year-old man with a known history of hypertension and type 2 diabetes, presented to the Emergency Department due to exertional chest pain. On physical examination, bilateral Frank's sign was evident. His ECG revealed ST depression and T-wave inversion in V4-V6. The peak cardiac troponin T was 38

ng/L. He was admitted for coronary angiography, that showed severe coronary artery disease (CAD) with 90% ostial stenosis of the left main coronary artery. Due to these findings, the patient was scheduled for CABG.

**Conclusions:** Our patient exhibited bilateral Frank's sign and was revealed to have significant coronary artery disease on angiography. In this way, the presence of DELC may be useful as a cutaneous predictor of CAD. Even though these are associated with aging, the presence of DELC has a better clinical correlation in men under 60.

**Keywords:** Frank's sign, coronary artery disease, atherosclerosis



**Figure 1.** CAD. Coronary angiography showing 90% ostial stenosis of the left main coronary artery.



**Figure 2.** Frank's sign.

[Abstract:0719]

## EFFECTS OF INTRAVENOUS FUROSEMIDE PLUS SMALL-VOLUME HYPERTONIC SALINE SOLUTIONS ON INFLAMMATORY, REMODELING MARKERS AND EPIGENETIC SIGNATURES OF PATIENTS WITH CONGESTIVE HEART FAILURE

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Heart failure is a leading cause of death in industrialized nations, despite the therapeutic. HF involves micro- and macro-structural changes, each involving the activation of inflammatory and neuro-hormonal systems that release several biomolecules to compensate the failing heart.

We conducted a prospective study sought to compare the effects of furosemide + HSS (107 patients) treatment in patients with acute decompensated heart failure in comparison to furosemide alone (93 patients) and the response in a compensated state (T1) and after an acute saline load (T2) with regard to serum levels biomarkers and specific MiRNA fold changes.

Patients treated with high-dose furosemide + HSS showed significantly higher absolute delta values of IL-6, sST2, hsTnT, NT-proBNP and galectin-3. After acute saline load, a lower increase in the serum concentrations of IL-6, sST2 and NT-proBNP. Between T1 and T2, patients treated with high-dose furosemide plus HSS showed a lower increase in the serum levels of IL-6, hsTnT, sST2, NT-proBNP and galectin-3. We observed a higher reduction of MIR181b\* fold change in subjects treated with furosemide plus HSS, at T1 and of MIR365. At "in-group" analysis, we observed a change at T0 vs T1 with regard to MIR214, MIR181, MIR1505p, MIR125a5p and at T1 vs T2 with regard of MIR214, MIR365, MIR181b, MIR1505p, MIR125a5p.

Our findings concerning a higher degree of modulation of biomarkers of heart failure after combined treatment with intravenous furosemide and HSS, and this finding has also an epigenetic feature indicating a possible genetic modulation of treatment with i.v. furosemide plus HSS.

**Keywords:** heart failure, MiRNA, inflammation, cytokines, hypertonic saline solution

VARIABLES	GROUP	TO - ADMISSI ON	BETWEEN - GROUP P	T1 - AFTER 6 DAYS OF TREATMENT	BETWEEN - GROUP P	IN - GROUP P P (T0 - T1)	T2 - AFTER SALINE OVERLOAD	BETWEEN - GROUP P	IN - GROUP P P (T1 - T2)
IL6 (pg/ml)	furosemide alone group	2.04 (0.8)	0.077	1.88 (1.04)	0.170	0.078	3.24 (1.18)	<0.0005	<0.0005
	furosemide+HSS group	2.31 (1.2)		1.70 (0.82)		<0.0005	1.96 (0.94)		<0.0005
hsTnT (ng/ml)	furosemide alone group	0.03 (0.02)	0.145	0.02 (0.01)	0.692	<0.0005	0.03 (0.03)	<0.0005	<0.0005
	furosemide+HSS group	0.03 (0.02)		0.02 (0.01)		<0.0005	0.01 (0.01)		<0.0005
sST2 (ng/ml)	furosemide alone group	37.5 (6.9)	<0.0005	28.7 (7.0)	0.430	<0.0005	43.6 (6.8)	<0.0005	<0.0005
	furosemide+HSS group	41.6 (8.8)		27.8 (7.7)		<0.0005	36.9 (7.48)		<0.0005
Gal 3 (ng/ml)	furosemide alone group	16.6 (3.8)	0.130	11.8 (2.3)	0.389	<0.0005	18.8 (2.92)	<0.0005	<0.0005
	furosemide+HSS group	15.8 (3.2)		11.6 (1.9)		<0.0005	13.8 (2.0)		<0.0005
CRP (mg/dl)	furosemide alone group	2.2 (0.7)	0.667	2.15 (0.7)	0.366	1	2.3 (0.7)	0.079	0.719
	furosemide+HSS group	2.2 (0.8)		2.06 (0.63)		0.173	2.1 (0.6)		1.0
NtPro BNP (pg/ml)	furosemide alone group	5229 (4571)	0.072	4323 (4176)	0.071	<0.0005	6083 (5025)	<0.0005	<0.0005
	furosemide+HSS group	6786 (7110)		3279 (3963)		<0.0005	3195 (3784)		1
MIR214	furosemide alone group	0.83 (0.09)	0.785	0.73 (0.14)	<0.0005	<0.0005	0.85 (0.05)	0.107	<0.0005
	furosemide+HSS group	0.84 (0.09)		0.47 (0.12)		<0.0005	0.84 (0.05)		<0.0005
MIR365*	furosemide alone group	0.84 (0.07)	0.266	0.63 (0.07)	<0.0005	<0.0005	0.85 (0.05)	0.66	<0.0005
	furosemide+HSS group	0.85 (0.08)		0.47 (0.12)		<0.0005	0.84 (0.05)		<0.0005
MIR181b*	furosemide alone group	0.81 (0.09)	0.203	0.82 (0.08)	0.204	0.461	0.65 (0.1)	<0.0005	<0.0005
	furosemide+HSS group	0.83 (0.1)		0.85 (0.09)		0.019	0.50 (0.15)		<0.0005
MIR1505p*	furosemide alone group	0.78 (0.16)	0.702	0.85 (0.09)	0.906	<0.0005	0.46 (0.11)	0.036	<0.0005
	furosemide+HSS group	0.79 (0.15)		0.85 (0.09)		<0.0005	0.51 (0.15)		<0.0005
MIR125a5p*	furosemide alone group	0.78 (0.16)	0.774	0.85 (0.09)	0.989	<0.0005	0.46 (0.10)	0.03	<0.0005
	furosemide+HSS group	0.79 (0.15)		0.85 (0.88)		<0.0005	0.51 (0.16)		<0.0005

**Table 1.** Myocardial stress variable values and micro-RNA fold changes, after furosemide + HSS or furosemide therapy at T0 (baseline), at T1 (after six days of treatment with i.v. furosemide+HSS or i.v. furosemide alone) and at T2 after saline load (after a saline lo).

HFREF, heart failure with reduced ejection fraction; IL-6, interleukin-6; hsTnT, high sensitivity troponin-T; sST2, suppression of tumorigenicity 2; Gal 3, Galectin-3; CRP: C-reactive protein; NtPro BNP, N-terminal pro-brain natriuretic peptide; \*MirNA fold increase in furosemide +HSS group and in Furosemide alone Group after six days of treatment. (T1) and after an acute saline load.

[Abstract:0728]

## THE PROGNOSTIC ROLE OF ULTRASOUND DIAGNOSTIC METHODS IN THE COMPREHENSIVE ASSESSMENT OF CONGESTION IN PATIENTS WITH ACUTE DECOMPENSATION OF HEART FAILURE

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**Aim:** To evaluate the prognostic value of ultrasound diagnostic methods, the number of B-lines according to lung ultrasound, the presence of hepatic venous congestion according to the VExUS protocol and liver density according to indirect elastometry performed upon discharge from the hospital.

**Materials and Methods:** The study included 207 patients (54,1% men, mean age 71 years) with ADHF. Threshold values - the number of B lines > 5, liver density > 6.2 kPa.

**Results:** 63 (30%) endpoints and 23 (11%) deaths were detected. Cox regression confirmed independent predictive significance for the potential endpoint risk for the following: liver density >6.2 kPa (HR 1,9 (95% CI 1.0 – 3.3); p=0.029), and hepatic venous congestion according to the VExUS protocol (HR 2.8 (95% CI 1.3 – 5.7); p=0.004). There was a significant increase in the risk of overall mortality and re-hospitalization in the presence of congestion, identified by liver fibroelastometry + lung ultrasound (HR 10.5 (95% CI 2.3 – 46.2); p = 0.002), according to ultrasound assessment of hepatic venous congestion according to the VExUS + lung ultrasound protocol (HR 16.7 (95% CI 3.9 – 70.7); p < 0.001), according to all three methods (HR 40.1 (95% CI 6.6 – 243.1); p < 0.001).

**Conclusions:** Ultrasound diagnostic methods, performed upon discharge from the hospital in a comprehensive assessment of congestion in patients with acute decompensation of heart failure (ADHF) have independent prognostic value, and when using all three methods the prognostic role is maximal

**Keywords:** prognostic, ultrasound, heart failure

[Abstract:0732]

## THE EFFICACY OF CARDIOMAGNYL FOR THE SECONDARY PREVENTION OF ATHEROSCLEROTIC CARDIOVASCULAR DISEASES (ACVD) IN REAL CLINICAL PRACTICE: THE RESULTS OF AN OBSERVATIONAL RETROSPECTIVE STUDY CARDINAL

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**Aim:** To evaluate the efficacy of Cardiomagnyl for the secondary prevention of atherosclerotic cardiovascular diseases (ACVD) in real clinical practice

**Materials and Methods:** An observational, non-interventional, retrospective study using data from electronic medical records of 18,199 patients with ACVD in Russian population between January 2012 and March 2023 was performed. Patients were divided into 2 groups - who received ASA 75-100 mg (n=9784) and patients who did not receive ASA (n=8325). We compared the efficacy of Cardiomagnyl 75 mg versus enteric-coated aspirin 100 mg. To evaluate the effect of ASA drugs on the incidence of cardiovascular events, groups of patients with ACVD receiving ASA 75-100 mg and patients not receiving ASA were selected. Propensity score matching was applied to ensure between-group comparability in baseline patient characteristics in both cases.

**Results:** The frequency of ischemic stroke, myocardial infarction and MACE in the group of patients who received ASA 75-100 mg (n=427) was significantly lower than in patients who did not take ASA drugs (n=427) and amounted to 4.7% vs. 8.7%, 0.9% vs. 3.3%, 5.6% vs. 11.9%, respectively. Significantly lower incidence of unstable angina (0.8% vs. 2.0%), myocardial infarction (1.5% vs. 3.9%) and MACE (5.4% vs. 7.8%) were demonstrated in the group of patients who received Cardiomagnyl 75 (n=1308) in contrast to the enteric-coated forms of ASA 100 mg (n=1308).

**Conclusions:** In real clinical practice reliable advantages of Cardiomagnyl 75 mg (buffered form of ASA) in comparison with enteric-coating aspirin 100 mg have been revealed

**Keywords:** cardiomagnyl, atherosclerotic cardiovascular diseases, real clinical practice

[Abstract:0749]

## COMPREHENSIVE ASSESSMENT OF HYDRATION STATUS IN PATIENTS WITH ACUTE DECOMPENSATED HEART FAILURE DEPENDING ON GLUCOSE METABOLISM

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**Background:** Congestion or hydration status is a marker of poor prognosis in patients with heart failure (HF). In addition to NT-pro-brain natriuretic peptide, data of bioimpedance vector analysis (BIVA), lung ultrasound (LUS) and Liver Stiffness (LS) Assessed by Transient Elastography are emerging new markers for congestion.

**Aim:** to evaluate the hydration status in patients with HF at the time of admission and hospital discharge by 4

**Methods:** NT-proBNP, BIVA, B-lines of LUS (8 zones) and LS.

**Methods:** 280 patients (53% males, 70.1 ±10.8 years old) with ADHF were included. The patients were divided: HbA1c <5.7% - without glucose metabolism disorders, 5.7-6.4% - prediabetes group, ≥6.5% - type 2 diabetes group.

**Results:** The frequency of glucose disturbance in patients with ADHF is 57.5% (n=161), while prediabetes was detected in 17.1% (n=48), type 2 diabetes in 40.4% (n=113) of cases. In patients with glucose disturbance, residual congestion detected by clinical and laboratory/instrumental data was significantly higher (96% vs. 87%, p<0.01), subclinical congestion was significantly lower (4% vs. 13%, p<0.01) than in patients without glucose disturbance. The frequency of residual congestion at discharge, in patients with glucose disturbance was also significantly higher (55% vs. 39%, p<0.01), and subclinical congestion was significantly lower (14% vs. 27%, p<0.01) than in the group without glucose disturbance.

**Conclusions:** patients with ADHF and glucose disturbances had a significantly higher frequency of typical clinical symptoms and signs of CHF and more pronounced laboratory/instrumental data of congestion than patients without glucose disturbances at admission and hospital discharge.

**Keywords:** hydration, heart failure, glucose, bioimpedance vector analysis, lung ultrasound, liver stiffness

[Abstract:0755]

## COMPLEX DIAGNOSTIC AND THERAPEUTIC MANAGEMENT OF INFECTIVE ENDOCARDITIS WITH COXIELLA BURNETII IN A PATIENT WITH BIO-PROSTHETIC VALVES AND A CHRONIC RENAL FAILURE

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Infective endocarditis on prosthetic valves represents a formidable diagnostic and therapeutic challenge, particularly when presenting with negative blood cultures.

we present the case of a 79-year-old man referred for a probable infective endocarditis. Having undergone mitral-aortic valve replacement 11 months prior due to mitral and aortic leaks, his medical history included hypertension, atrial fibrillation, and chronic renal failure.

The patient reported, a persistent asthenia and fever. The clinical examination revealed lower limb oedema, petechial purpura, and signs of both left and right-sided heart failure. Cardiac echography showed two mobile masses with stenosis and leakage on the mitral and aortic bio prostheses. Biological results showed anaemia, severe thrombocytopenia, and a positive inflammatory syndrome. Initial antibiotic therapy with vancomycin and gentamicin was established after three series of blood culture. It did not yield the expected improvement despite an effective serum concentration and caused a deterioration in renal function leading to dialysis. Serological tests, conducted after 15 days of negative blood cultures, revealed exclusive positivity for IgM *Coxiella burnetii*. Adjusting the antibiotic therapy to doxycycline and levofloxacin led to a decrease in C-reactive protein; however, the patient died within conditions of severe denutrition.

This case emphasizes the prognostic impact of late diagnosis of bacterial aetiology and therefore delays in therapeutical and clinical management.

the complexity of blood culture-negative endocarditis highlight the importance of alternative diagnostic methods, such as serology and molecular biology.

**Keywords:** infective endocarditis, *Coxiella burnetii*, mitro-aortic valve replacement

[Abstract:0762]

## INCREASED SERUM GALACTIN-3 IS ASSOCIATED WITH ENDOTHELIAL DYSFUNCTION IN PATIENTS WITH HYPERTENSION

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**Purpose:** Galectin-3 participates in cardiovascular disease development. Endothelial dysfunction is associated with increased mortality in patients with hypertension. The present study aimed to determine the relationship between serum galectin-3 levels and endothelial dysfunction in patients with hypertension.

**Methods:** The present study included 120 hypertension patients. A commercial enzyme-linked immunosorbent assay kit was used to measure galectin-3 levels. The endothelial function and vascular reactivity index (VRI) were measured using a digital thermal monitoring (DTM) test. In this study,  $VRI < 1.0$  was used as the poor vascular reactivity,  $1.0 \leq VRI < 2.0$  was used as the intermediate vascular reactivity, and  $VRI \geq 2.0$  was used as the good vascular reactivity.

**Findings:** 12 hypertensive patients were categorized as having poor vascular reactivity ( $VRI < 1.0$ ), 57 hypertensive patients were categorized as having intermediate vascular reactivity ( $1.0 \leq VRI < 2.0$ ), and 51 hypertensive patients had good vascular reactivity. Older age ( $p = 0.010$ ) and a higher serum total cholesterol level, low-density lipoprotein cholesterol level, C-reactive protein (CRP), galectin-3, and a lower estimated glomerular filtration rate were associated with poor vascular reactivity. After multivariable forward stepwise linear regression analysis, it was noted that advanced age, log-CRP, and serum galectin-3 were negatively associated with VRI values in hypertensive patients. The serum level of galectin-3 was also positively associated with log-CRP in hypertensive patients.

**Conclusions:** Serum galectin-3, together with CRP and age, is associated with VRI values and is a potential endothelial function modulator and a valuable biomarker of endothelial dysfunction in hypertensive patients.

**Keywords:** galectin-3, vascular reactivity index, hypertension

[Abstract:0774]

## AN UNUSUAL CASE OF COMPLICATED NATIVE VALVE INFECTIVE ENDOCARDITIS IN A YOUNG PATIENT

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**Introduction:** Infective endocarditis can lead to potentially life-threatening complications. We present an uncommon case of complicated native valve infective endocarditis in a young patient.

**Clinical Case:** A 33-year-old male living in São Tomé and Príncipe, without prior medical history, was admitted in his country of origin to study a chronic recurrent chest pain and a diagnosis of native mitral valve infective endocarditis was made. No infectious agent was isolated. Antibiotic therapy with ampicillin, gentamicin and flucloxacillin was initiated and maintained for weeks without improvement and complications arose: perivalvular abscess and thoracic aortic aneurysm (TAA). He was subsequently transferred to Portugal for further care.

Upon admission, he was in good general condition without acute organ failure. Physical examination noted a diastolic murmur of V/VI intensity, audible throughout the precordium and interscapular region, and otherwise unremarkable.

Microbiologic tests were negative. Echocardiography and thoraco-abdominal-pelvic and supra-aortic trunk computed tomography (CT) were requested for further planning.

Echocardiogram revealed: aneurysm vs basal pseudoaneurysm of the anterior wall of the left ventricle; dilated atria; moderate mitral valve insufficiency, local abscess, and vegetation; large aortic root abscess. CT angiography revealed mycotic saccular aneurysmal degeneration of the descending thoracic aorta.

A multidisciplinary approach, including Cardiac and Vascular Surgery was under discussion. The patient remained clinically stable and autonomous until the 3<sup>rd</sup> day of hospitalization but, unfortunately, sudden, and irreversible cardiorespiratory arrest occurred on the 4<sup>th</sup> day.

**Discussion:** This case of complex complicated infective endocarditis reinforces the importance of early exclusion of endocarditis complications and referral to specialized centres.

**Keywords:** endocarditis, complicated infective endocarditis, native mitral valve, Mycotic aneurysm

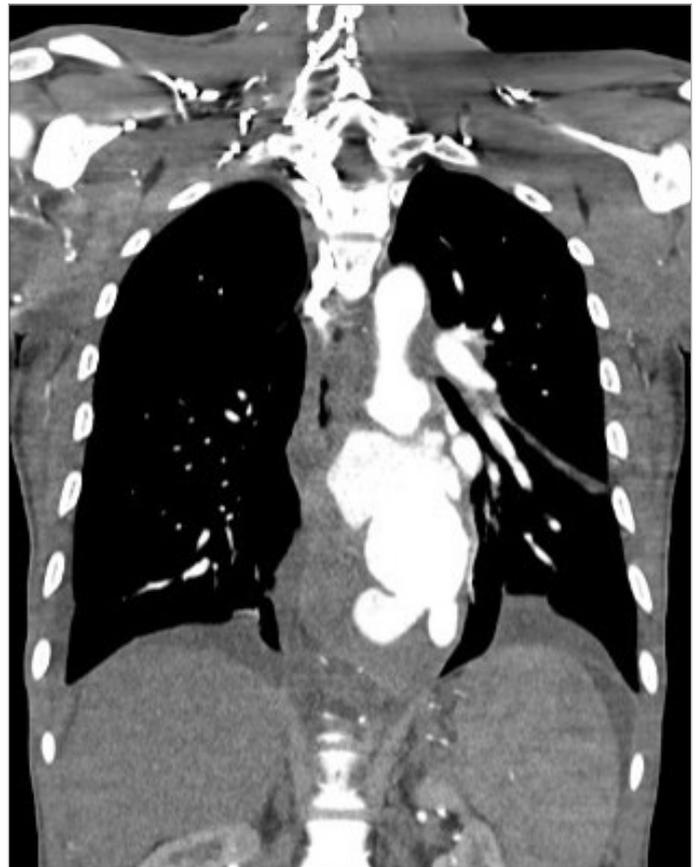


Figure 1. Complicated native valve infective endocarditis - thoracic aortic aneurysm

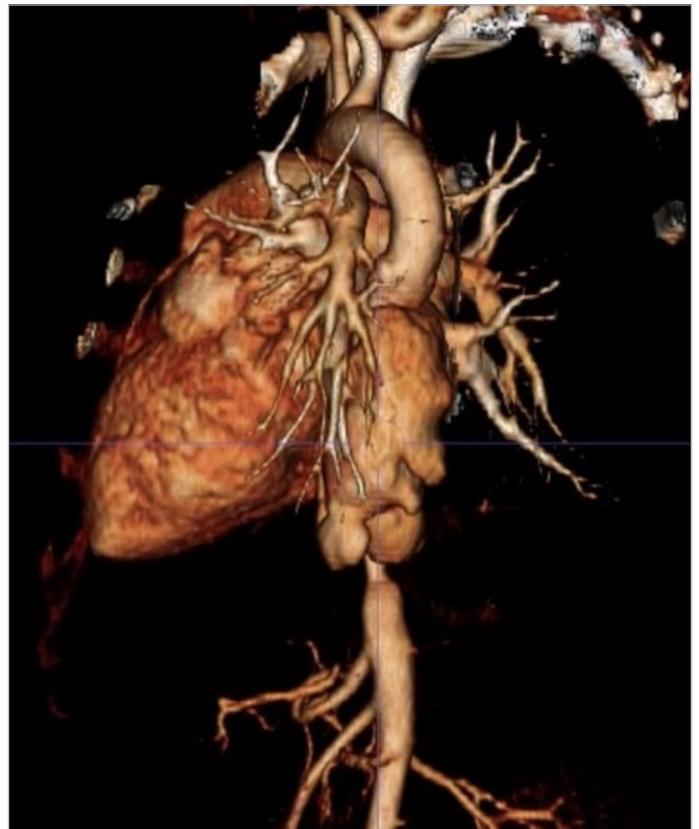


Figure 2. Complicated native valve infective endocarditis - thoracic aortic aneurysm



**Figure 3.** Complicated native valve infective endocarditis - thoracic aortic aneurysm.

[Abstract:0785]

## A RARE CAUSE OF RIGHT VENTRICULAR FAILURE

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We present the case of a 73 years old woman who presented to the Emergency Department for progressive dyspnoea on minimal exertion, fatigue, and lower limb oedema. The patient was a non-smoker, with a history of arterial hypertension grade 2, venous insufficiency and hereditary haemorrhagic telangiectasia (HHT) disease with recurrent episodes of epistaxis, the last one with severe bleeding one month before. Also, the patient's brother and mother had HHT. The physical examination revealed paleness of skin and mucous membranes with multiple telangiectasias, lower limb oedema, jugular vein distention and absence of any pathological lung sounds. The ECG was normal, the biological essays disclosed severe microcytic hypochromic anaemia (Hb 5.83 g/dL), and high NT-proBNP (1700 pg/ml). The echocardiography showed 45% ejection fraction, severe tricuspid regurgitation, PAPs 60 mmHg, dilated right ventricle, gradient between right ventricle and right atrium was 45 mmHg, inferior vena cava with 22 mm diameter and no respiratory collapse. Given the fact that

the patient was a non-smoker, without toxic exposure or history of COPD, we decided to perform a CT scan which revealed multiple arterio-venous malformations in lungs and liver. The patient received blood transfusion, iron supplementation and diuretic medication and had a favourable evolution. Hereditary haemorrhagic telangiectasia (Osler-Weber-Rendu disease) is an autosomal dominant disorder with many complications; pulmonary hypertension is one of them and appears in less than 10% of the patients. In this case, the presence of the pulmonary and hepatic arterio-venous malformations had a synergic effect on causing pulmonary hypertension.

**Keywords:** right ventricular failure, hereditary haemorrhagic telangiectasia, Osler-Weber-Rendu disease, pulmonary hypertension

[Abstract:0811]

## INTRACORONARY ADMINISTRATION OF EPINEPHRINE IN THE REFRACTORY NO-REFLOW PHENOMENON IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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**Purpose:** to evaluate the efficacy and safety of intracoronary administration of epinephrine in the treatment of the refractory no-reflow phenomenon in patients with ST-segment elevation myocardial infarction during percutaneous intervention (PCI).

**Materials and Methods:** a single-centre, prospective, controlled study was conducted, registration at ClinicalTrials.gov: NCT04573751. The study included 40 patients with a refractory no-reflow phenomenon, which was determined in cases where it was not resolved by the use of at least one of the following agents: nitroglycerin, adenosine, papaverine, platelet receptor inhibitors IIB/IIIA, thromboaspiration. The patients were divided into 2 groups: patients of the 1st group (n = 18) received epinephrine 100 µg intracoronary, patients of the 2nd group (n = 22) received standard therapy without epinephrine.

**Results:** in the epinephrine group, TIMI 3 flow was more often achieved: 55.6% vs. 0% (p<0.01), ST elevation decrease >50% within 1 hour after PCI: 72.2% vs. 31.8% (p =0.01). The level of troponin I 12-24 hours after PCI was significantly lower in the epinephrine group than in the control: 15.2 (6;25) ng/ml versus 25 (10;40) ng/ml (p=0.03). Life-threatening hemodynamic disturbances and cardiac arrhythmias were not registered after the use of epinephrine. There were no statistically significant differences in cardiac ultrasound data and MACE events during 30 days of follow-up.

**Conclusions:** Intracoronary administration of epinephrine at a dose of 100 µg in STEMI patients with a refractory no-reflow phenomenon during PCI is a safe and effective method to improve blood flow in an infarct-related coronary artery.

**Keywords:** myocardial infarction, no-reflow phenomenon, intracoronary epinephrine

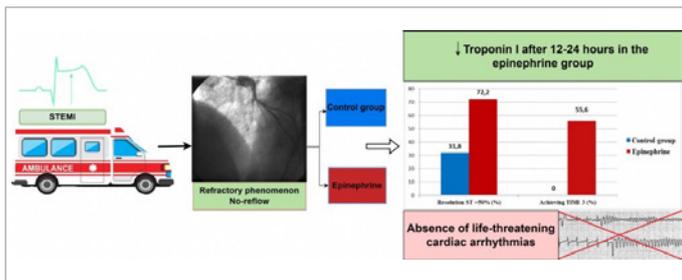


Figure 1. Central illustration.

Indicator	Standard treatment	Epinephrine	P
<b>Laboratory data</b>			
Glucose on admission, mmol/l, Me (Q25; Q75)	9,94 (8,3; 11)	9,95 (7,3; 13,1)	0,96
Cholesterol, mmol/l, Me (Q25; Q75)	4,9 (4,24; 5,82)	5,05 (4,4; 6,4)	0,87
Triglycerides, mmol/l, Me (Q25; Q75)	1,13 (0,63; 2,07)	1,55 (0,64; 2,34)	0,56
GFR (according to CKD-EPI), ml/min, Me (Q25; Q75)	63,0 (47,0; 82,0)	71,0 (51,0; 88,0)	0,85
Troponin I on admission, ng/ml, Me (Q25; Q75)	1,49 (0,08; 2,4)	0,31 (0,08; 2,6)	0,80
Troponin I after 12-24 hours, ng/ml, Me (Q25; Q75)	15,2 (6,25)	25 (10,40)	0,03
<b>Instrumental data:</b>			
Reaching TIMI 3 at the end of the PCI, n (%)	0 (0)	10 (55,6)	<0,05
ST elevation resolution >50% within 1 hour, n (%)	7 (31,8)	13 (72,2)	0,01
<b>Hemodynamic parameters and complications of PCI:</b>			
Heart rate at the end of PCI, Me (Q25; Q75)	80,5 (69; 96)	77 (66; 92)	0,55
Heart rate after epinephrine, Me (Q25; Q75)	-	110 (90; 124)	
Ventricular extrasystole, n (%)	0 (0)	6 (33,3)	<0,05
Atrial fibrillation, n (%)	0 (0)	3 (16,7)	0,55
Ventricular tachycardia, n (%)	1 (4,5)	2 (11,1)	0,43
<b>Echocardiographic indicators:</b>			
EDV LV 1-3 days, ml, Me (Q25; Q75)	110 (98; 120)	95 (86; 109)	0,19
ESV LV 1-3 days, ml, Me (Q25; Q75)	61 (48; 78)	50 (43; 61)	0,21
EF LV 1-3 days, %, Me (Q25; Q75)	45 (38; 56)	46 (43; 51)	0,73
IVLC 1-3 days, Me (Q25; Q75)	1,69 (1,25; 2)	1,44 (1,31; 1,78)	0,47
EDV LV 7-10 days, ml, Me (Q25; Q75)	129 (110; 144)	101 (90; 115)	0,08
ESV LV 7-10 days, ml, Me (Q25; Q75)	66,5 (42,5; 98)	44 (42; 59)	0,15
EF LV 7-10 days, %, Me (Q25; Q75)	48 (37,5; 55)	51 (48; 54)	0,44
IVLC 7-10 days, Me (Q25; Q75)	1,51 (1,24; 1,82)	1,44 (1,31; 1,75)	0,71
Hospital mortality, n (%)	2 (9,1)	1 (5,6)	0,64
MACE events for 30 days, n (%)	5 (22,7)	2 (11,1)	0,37
Lethality within 30 days, n (%)	3 (13,6)	1 (5,6)	0,41

Table 1. Results of laboratory and instrumental research methods and outcomes.

[Abstract:0823]

## EVALUATION OF CIRCADIAN BLOOD PRESSURE VARIATIONS IN INDIVIDUALS WITH IRON DEFICIENCY WITHOUT ANEMIA

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**Aim:** We aimed to evaluate dipper and non-dipper patterns by using ambulatory blood pressure monitoring in iron deficiency where cardiac contractility is impaired, which is one of the steps before anaemia occurs, considering that increased sympathetic activity due to anaemia and cardiac remodelling may cause non-dipper hypertension.

**Materials and Methods:** All volunteers with anaemia-free iron Deficiency between the ages of 18 and 65 who applied to the Internal Medicine Outpatient Clinic of Ankara Bilkent City Hospital and all volunteers consisting of a healthy control group who applied to our outpatient clinic for other reasons and did not receive one of the diagnoses in the exclusion criteria were

included in our study.

A blood pressure Holter device was attached to the individuals included in our study and ambulatory blood pressure monitoring was performed for 24 hours.

**Results:** The median night time heart rate of the iron deficiency group was found to be higher than the control group, although it was within the normal range, and a statistically significant difference was found.

The non-dipper status was found to be higher in the iron deficient group than in the control group.

**Conclusions:** With our study, we have shown that changes occur in the cardiovascular system in the iron deficiency phase before anaemia and that the non-dipper pattern is observed more frequently. Thus, early recognition of iron deficiency and treatment can be recommended as it can reduce complications.

**Keywords:** iron deficiency, dipping, non dipping

[Abstract:0836]

## PROGNOSTIC ROLE OF NT-PROBNP AND LEFT VENTRICULAR EJECTION FRACTION IN PATIENTS WITH NON-ALCOHOLIC FATTY LIVER DISEASE AND ACUTE DECOMPENSATED HEART FAILURE

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**Aim:** To study the prognostic value of NT-proBNP and left ventricular ejection fraction (LVEF) in patients with non-alcoholic fatty liver disease (NAFLD) and acute decompensated heart failure (ADHF).

**Materials and Methods:** Included were 566 patients hospitalized with ADHF, NYHA II-IV, age 72.4±11.4 years. All patients had NT-proBNP assessed, liver fibroelastometry and echocardiography. The patients were divided into 2 groups: 1 - ADHF and NAFLD, n=168; 2 - ADHF without NAFLD, n=398.

**Results:** In group 1 (ADHF and NAFLD), LVEF was higher [48 (35;56)% vs 45 (34;55)%, p=0.028], heart failure with preserved EF (HFpEF) was more common [39.9% vs 26.7 %, p=0.006] and there were lower NT-proBNP values at admission [1070 (268;2127) pg/ml vs 1850 (798;3515) pg/ml, p<0.001] and at discharge [808 (158;1574) pg/ml vs 1685 (628;2733) pg/ml, p<0.001] compared to group 2.

In patients with NAFLD and ADHF, according to multivariate Cox regression analysis, the level of NT-proBNP at discharge was >1593 pg/ml (hazard ratio (RR) 3.14; 95% confidence interval (CI) 1.52-6.43; p<0.001) and LVEF <40% (HR 2.90; 95% CI 1.46-5.76; p=0.002) was independently associated with a higher likelihood of all-cause death during the 3-year follow-up period.

**Conclusions:** Thus, the group with NAFLD and ADHF was characterized by lower NT-proBNP values and more often had HFpEF. Assessment of NT-proBNP and LVEF had an important prognostic role in stratifying the risk of death from any cause during the observation period, despite lower NT-proBNP cut-off values.

**Keywords:** non-alcoholic fatty liver disease, acute decompensated heart failure, NT-proBNP.

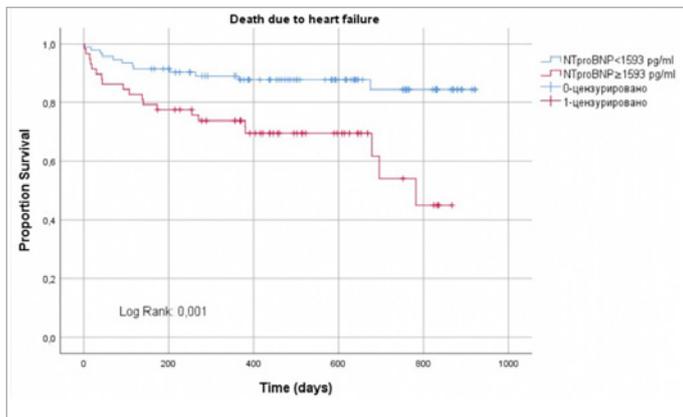


Figure 1. Kaplan-Meier curve.

[Abstract:0838]

## ALBUMINURIA AND NEWLY DIAGNOSED HEART FAILURE WITH PRESERVED EJECTION FRACTION IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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**Aim:** To evaluate the frequency of albuminuria and newly diagnosed heart failure with preserved ejection fraction in patients with type 2 diabetes.

**Methods:** 100 patients with T2DM were included (female, 62%; mean age, 64±10 years). The detailed echocardiographic criteria for LV diastolic dysfunction, the natriuretic peptide NT-proBNP, urine albumin to creatinine ratio (UACR) were detected in all patients. HFA-PEFF score was used as a diagnostic parameter of heart failure with preserved ejection fraction (HFpEF): high probability/confirmed HFpEF (≥5 points), intermediate probability HFpEF (2-4 points), low probability/excluded HFpEF (<2 points). Patients were divided into 2 groups with albuminuria (>30 mg albumin/g creatinine) and without albuminuria (<30 mg albumin/g creatinine).

**Results:** High probability/confirmed HFpEF HFpEF were identified in 46% (n=46) patients, intermediate probability

HFpEF in 37% (n=37), low probability/excluded HFpEF in 17% (n=17). Albuminuria was detected in 55% (n=55) patients with DM. Albuminuria was detected in 71% (n=39) patients with high probability/confirmed HFpEF, in 22% (n=12) patients with intermediate probability HFpEF, in 7% (n=4) patients with low probability/excluded HFpEF (p<0,05). In patients with HFpEF albuminuria was associated with the following echo parameters with: E/e'>9 (r=0,51; p < 0,001) and Left ventricular mass index (LVMI) ≥115 g/m<sup>2</sup> (male) or ≥95 g/m<sup>2</sup> (female) (r=0,68; p < 0,001).

**Conclusions:** The frequency of albuminuria was significantly high in patients with type 2 diabetes and high probability/confirmed HFpEF and was associated with echo parameters E/e' ratio and LVMI.

**Keywords:** newly diagnosed heart failure, albuminuria, heart failure with preserved ejection fraction, type 2 diabetes mellitus

[Abstract:0857]

## CARDIOVASCULAR RISK AWARENESS: IS THE PATIENT AWARE?

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People's awareness of cardiovascular risk (CVR) factors is not fully investigated. Our aim was to evaluate CVR awareness of patients with a different cardiovascular risk. A total of 284 patients were enrolled: 148 (52%) from Hypertension-Dyslipidaemia Centre (HDC), 92 (32.3%) from Diabetes Centre (DC) and 45 (15.7%) from Obesity Centre (OC). Patients completed a questionnaire to evaluate their awareness of CVR. The questionnaire was composed of 20 questions, which included demographic characteristics, personal and family history, information needed to calculate SCORE CVR. Their perception of CVR was compared with doctors' CV score evaluation. 32.1% of patients had low CVR, 26% moderate CVR, 14.6% high CVR and 27.3% very high CVR.

Only 40% of patients had a correct perception of their CVR, among patients with incorrect CVR perception, most of patients underestimated their risk (85%) and only 15% overestimated it. CVR was underestimated by 54.7% of patients of HDC, by 49.2% of DC and by 41% of OC. A significant association was found between CVR overestimation and different centres (p<0.01); OC had the highest percentage of patients overestimating CVR (33.3%). Very-high-risk patients had no awareness of their risk condition. In fact, among patients at very high risk (27.3%), only 1.5% perceived this condition, with significant differences among the specific clinics (p<0.01): 0 vs 31 in HDC; 3 vs 25 in DC; 1 vs 6 in OC. Our data showed underestimation of CVR among patients especially between very-high-risk patients underlining the need for maximize patients' risk consciousness and adherence.

**Keywords:** cardiovascular risk, awareness, risk factors

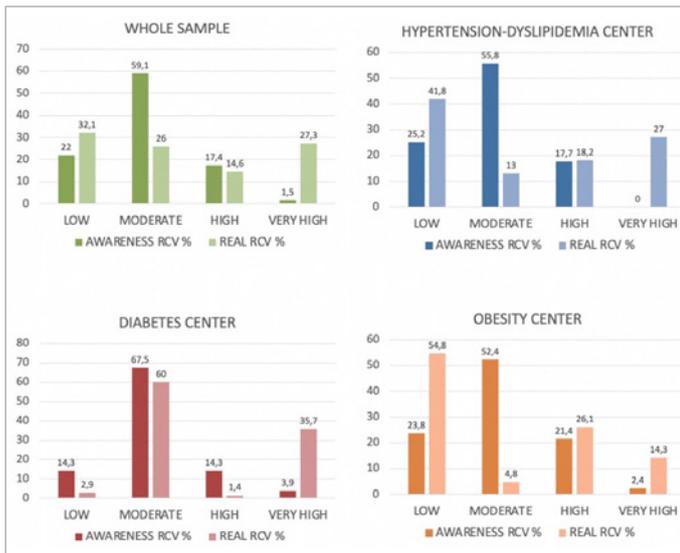


Figure 1. Cardiovascular risk awareness.

Cardiovascular risk awareness: patients perspective vs real cardiovascular risk

[Abstract:0863]

## PROGNOSTIC IMPACT OF STATIN USE IN PATIENTS WITH HEART FAILURE WITH PRESERVED EJECTION FRACTION: DOES IT DIFFER IN PATIENTS WITH AND WITHOUT ISCHEMIC HEART DISEASE?

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**Objective:** To analyse the effect of statins in reducing mortality in patients with heart failure (HF) with preserved ejection fraction (pEF) and if it differs according to the presence or absence of ischemic heart disease (IHD).

**Methods:** An analysis was performed based on data from the National Registry of Heart Failure (RICA), a prospective multicentre observational study of patients hospitalized for HF

in internal medicine departments nationwide. Sociodemographic characteristics, functional (Barthel) and cognitive (Pfeiffer) assessment scales, comorbidities, NYHA functional class, analytical variables, readmissions and mortality at 1-year follow-up were collected. Patients with HFpEF were selected and classified according to whether they had IHD or not, and factors related to mortality were analysed separately in both groups.

**Results:** Of 2788 patients diagnosed with HFpEF, 1757 (63%) were women and mean age was 80.1 ( $\pm 7.8$ ) years. 1121 patients (40.2%) were treated with statins. Ischemic aetiology of HF predominated in patients receiving statins.

In patients with HFpEF and IHD, a Barthel score  $\leq 60$  points was associated with higher mortality and beta-blocker use with lower. No association was observed between statin-treatment and mortality (OR:0.69; 95% CI (0.43-1.11);  $p=0.120$ ).

In patients with HFpEF without IHD, aging, anaemia, impaired renal function, functional impairment, worse NYHA functional grade, use of antialdosterone and digoxin were associated with higher mortality. However, the use of statins (OR:0.65; 95%CI: 0.51-0.83;  $p=0.001$ ) was independently associated with reduced mortality in patients without IHD. Female sex and obesity were also associated with lower mortality.

**Conclusions:** Statins were independently associated with a decrease in total mortality in patients with HFpEF without IHD but not in patients with IHD.

**Keywords:** heart failure, statins, preserved ejection fraction, ischemic heart disease

[Abstract:0866]

## ENVIRONMENTAL COST OF EARLY NON-INVASIVE CARDIAC TESTS FOR ACUTE CHEST PAIN AFTER EMERGENCY DEPARTMENT DISCHARGE

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**Introduction:** In patients discharged from the Emergency Department (ED) after evaluation for acute chest pain (ACP) it is still debated whether early cardiac tests provide any net clinical benefit (1). These tests produce pollution (2) that may potentially cause new cardiovascular events.

**Aim:** To estimate the environmental impact of early cardiac tests after ED discharge in patients at low- or intermediate-risk of cardiovascular events according to the HEART score.

**Methods:** We accessed the Kaiser Permanente Southern California (KPSC) cohort database (1). The dataset records all

encounters for ACP in 18 EDs and for each patient reports HEART score and what, if any, cardiac test is performed at 72 hours. Environmental impacts, expressed as CO<sub>2</sub> emissions (CO<sub>2</sub>e), of cardiac tests were extracted from previously published data (2).

As primary outcome, we estimated the environmental impact attributable to non-invasive cardiac tests performed in low- and intermediate-risk patients. We projected data to the US population considering 7 million ED accesses/year for ACP (3).

**Results:** 174917 patients were enrolled from 05/2016 to 12/2020. Low- and intermediate-risk patients undergoing tests were respectively 2.9% and 6.4% of total cohort. Non-invasive tests were estimated to produce respectively 33 and 124 tons of CO<sub>2</sub>e. In the US this corresponds to 1317 and 4958 CO<sub>2</sub>e tons/year and would be significantly higher with wider use of cardiac MRI or CT scan.

**Conclusions:** When considering the best diagnostic strategy for patients with ACP, environmental impact of cardiac tests should be considered.

1. Kawatkar JAMA Intern Med. 2020; 2. Marwick Heart. 2011; 3. Kontos JACC 2022

**Keywords:** acute chest pain, non-invasive cardiac tests, environmental impact, choosing wisely



**Figure 1.** CO<sub>2</sub> emissions from non-invasive tests in low and intermediate risk patients.

Estimated equivalent tons of CO<sub>2</sub> emitted in the atmosphere from KPSC HEART Cohort (panel A) and US estimated yearly emissions of tons of CO<sub>2</sub> considering different scenarios (panel B). In panel B first estimates are based considering distribution of tests equivalent to that of the KPSC cohort. In sensitivity analyses we estimated the impact if all low- and intermediate risk patients had undergone ECHO-stress, CCT or cMRI. The green columns represent the number of tree seedlings grown for 10 years that would be needed to remove corresponding emissions from the atmosphere. EI: environmental impact; CCT: cardiac compute tomography cMRI: cardiac MRI.

	N. of patients (%)	N. of patients undergoing non-invasive tests	Stress-ECG	Stress-ECHO	m-SPECT	Stress tests missing data	
total	174917	17484	7415	2703	7003	363	
<b>HEART score</b>							
0-3	106478 (61%)	5131 (2,9%)	3281 (1,9%)	541 (0,3%)	1054 (0,6%)	255	
4-6	63037 (36%)	11120 (6,4%)	3852 (2,2%)	2001 (1,1%)	5161 (3,0%)	153	
>= 7	5402 (3%)	1233 (0,7%)	282 (0,2%)	161 (0,1%)	784 (0,4%)	6	
			<b>Stress-ECG*</b>	<b>Stress-ECHO</b>	<b>m-SPECT</b>	<b>CCT</b>	<b>c-MRI</b>
Kg of CO <sub>2</sub> per exam <sup>4,5</sup>			2,9	2,9	20,7	25	302

**Figure 2.** Distribution of KPSC Heart cohort patients among non-invasive tests at 72 hours and environmental impact attributable to single non-invasive cardiac tests.

m-SPECT: myocardial perfusion SPECT (Single Photon Emission Computed Tomography) CCT: cardiac computed tomography; c-MRI: cardiac MRI. +: Values were considered to be comparable to those produced by a single stress-ECHO (see supplement for details).

[Abstract:0876]

## ALBUMINURIA AS A MARKER OF SYSTEMIC CONGESTION IN ACUTE DECOMPENSATION OF HEART FAILURE

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**Background:** Albuminuria in patients with heart failure is associated with high cardiovascular risks, mortality. The relationship of albuminuria with systemic congestion in acute decompensation of heart failure (ADHF) has not been fully studied.

**Purpose:** To evaluate the relationship of congestion parameters with the level of albuminuria in patients with ADHF.

**Methods:** 101 patients were included. 3 groups were formed according to the level of urine albumin/creatinine ratio at admission (A1, A2, A3, according to KDIGO guidelines): A1 - 38.6% (n=39), A2 12.9% (n=13), A3 48.5% (n=49). Patients with end-stage chronic kidney disease, acute coronary syndrome, oncology were excluded. Severity of congestion was evaluated on admission and discharge with «Shocks» score (scale of heart failure clinical severity), NT-proBNP, liver fibroelastometry, VExUS.

**Results:** SHOKS score was equal on admission and higher in groups A3 4(1;4,5) and A2 5(4;7) than in A1 3 (2;5) (p=0.024) at discharge.

Albuminuria was directly associated with:

- higher levels of NT-proBNP (pg/ml) on admission: 1325 (687;2475); 2208 (620;5273); 6040 (1995;14403),  $p=0.0036$ , discharge: 870(352;1628); 1307(781;2027); 2275(1678;8359),  $p=0.005$  Me (IQR) in A1, A2, A3 groups, respectively
- higher degree of congestion according to VExUS on admission: 53% (n=26); 79.5% (n=31); 61.6% (n=8),  $p=0.0003$  in A1, A2, A3 groups.
- increased liver density (kPa) at admission: 8.7 (5.3;13.2); 22.4 (10.2;42.8); 24.8 (15.5;52.6),  $p=0.002$ , discharge: 6 (4.6;9.7); 11.8 (6.3;24.1); 14.2 (7;25.4),  $p=0.042$  in A1, A2, A3 groups, respectively

**Conclusions:** level of albuminuria in patients with ADHF is tightly associated with severity of congestion assessed by NT-proBNP and instrumental methods.

**Keywords:** albuminuria, heart failure, systemic congestion status

[Abstract:0887]

## ASSOCIATION OF ACE I/D POLYMORPHISM WITH DIFFERENT COURSE OF CHRONIC HEART FAILURE AND MYOCARDIAL REMODELING IN PATIENTS AFTER CORONARY ARTERY BYPASS GRAFTING

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**Purpose:** To identify differences in the course of chronic heart failure (CHF) and to evaluate myocardial remodelling (MR) of the left ventricle (LV) in patients after coronary artery bypass grafting (CABG) during 18 months of follow-up depending on I/D polymorphism of ACE gene.

**Methods:** 105 patients with coronary heart disease who underwent CABG from 2018 to 2021 were included in the study. All patients underwent echocardiography, and the incidence of ACE gene I/D polymorphism was evaluated.

**Findings:** Depending on the I/D polymorphism of the ACE gene, patients were divided into 2 groups. In the first group - 57 patients with variants II and ID: 78% of men, mean age 63±8 years. In the second group - 48 patients with DD variant: 79% of men, mean age 61±7 years. Both groups were comparable in SYNTAX I scale, LV ejection fraction. In group 1 showed no significant LV volume or dimension changes. In group II progression of LV RM was observed: before CABG- LV end-diastolic volume 107.9±5.8 ml, LV end-systolic volume 53.9±4.9 ml, LV end-diastolic dimension 51.1±1.3 mm, LV end-systolic dimension 36.4±1.8 mm, after CABG 128.3±7.6 ml, 66.1±6.8 ml, 54.1±1.2 mm, 38.3±1.8 mm ( $p<0.05$ ). During follow-up, acute decompensation of CHF was detected in 10.7% of patients in sample 1, whereas in sample 2 in 30.4% of patients (OR 3.27; 95% CI: 1.05-10.57;  $p=0.022$ ).

**Conclusions:** ACE gene DD variant correlated with LV MR

progression, reflected in increased volume and size, and a threefold rise in acute decompensation of CHF during 18-month post-CABG follow-up.

**Keywords:** ACE gene I/D polymorphism, chronic heart failure, coronary artery bypass grafting

[Abstract:0890]

## INTERACTION BETWEEN STATIN AND SGLT-2 INHIBITOR: A CASE REPORT

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Statins and sodium-glucose cotransporter-2 inhibitors (SGLT-2i) are widely used, being a mainstay in the treatment of dyslipidaemia, diabetes mellitus and heart disease.

The authors present a case of a 78-year-old female patient, admitted to the emergency department (ED) with difficulty walking, intense myalgia, muscle cramps and non-specific malaise, slowly worsening over the previous 6 weeks. Physical examination revealed painful palpation of muscle masses, but no objective muscle strength reduction. Diagnostic workup revealed a marked elevation of creatine kinase (33 times the upper normal limit), de novo acute kidney injury and transaminase elevation. Anamnesis revealed that the patient was previously medicated with rosuvastatin due to severe coronary artery disease and had been admitted two months ago for an angioplasty. At discharge, the statin dosage had been increased, and she started dapagliflozin less than 72 hours before admittance to the ED. A diagnosis of iatrogenic rhabdomyolysis and secondary acute kidney injury due to statin-iSGLT2 cross-toxicity was made. The patient started intensive intravenous fluids and was admitted to the Internal Medicine ward. A broad etiological study was conducted, including myositis-associated antibodies, which yielded no results. The patient achieved a complete clinical recovery, with only slight persistent kidney function abnormalities.

Interactions between both drugs are complex, and side-effects such as statin-associated myopathy, may be synergistically potentiated by SGLT-2i. However, other alternative diagnostics (such as anti-HMGCR myopathy) must be considered, requiring an elevated level of suspicion from clinicians and exhaustive diagnostic study.

**Keywords:** statin, iSGLT2, sodium-glucose cotransporter-2 inhibitors, drug interaction, myopathy, iatrogeny

[Abstract:0906]

## IMPACT OF BIOLOGICAL THERAPY ON ATHEROSCLEROSIS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Cardiovascular disease (CVD) remains the leading cause of death worldwide, accounting for about 32% of all deaths. Rheumatoid arthritis (RA) has been shown to be independent cardiovascular risk factor and may increase the risk of atherosclerotic disease by 50% even in the subclinical or early stages of the disease. In order to reduce cardiovascular risk, optimal management of these patients requires control of both risk factors and inflammation. Due to its greater efficacy and safety profile, the use of biologic disease-modifying antirheumatic drugs (bDMARDs) has increased significantly over the last decade. Recent studies have demonstrated cardiovascular benefits for both tumour necrosis factor inhibitors (TNFi) and non-TNFi. For example, two molecules targeting inflammatory cytokines, Canakinumab (targeting interleukin (IL) 1 $\beta$ ) and Tocilizumab (targeting IL-6), have been studied in CANTOS (Canakinumab Anti-Inflammatory Thrombosis Outcome Study) and ASSAIL-IM (Assessing the effect of anti-IL-6 treatment in Myocardial Infarction (MI)) trials, with results demonstrating reduction in acute cardiovascular events. Data from national registries, observational cohort studies and meta-analyses suggested that bDMARDs provides cardioprotection beyond achieving disease remission. Regarding the risk of developing acute cardiovascular events, studies reported a 50% reduction for myocardial infarction in patients treated with TNFi and similar rates in non-TNFi users. Given that biological therapy may exert anti-atherosclerotic and cardioprotective effects, early initiation of targeted bDMARDs in selected patients needs to be taken into consideration.

**Keywords:** rheumatoid arthritis, inflammation, acute cardiovascular events

[Abstract:0907]

## NOT EVERYTHING IS AS IT SEEMS

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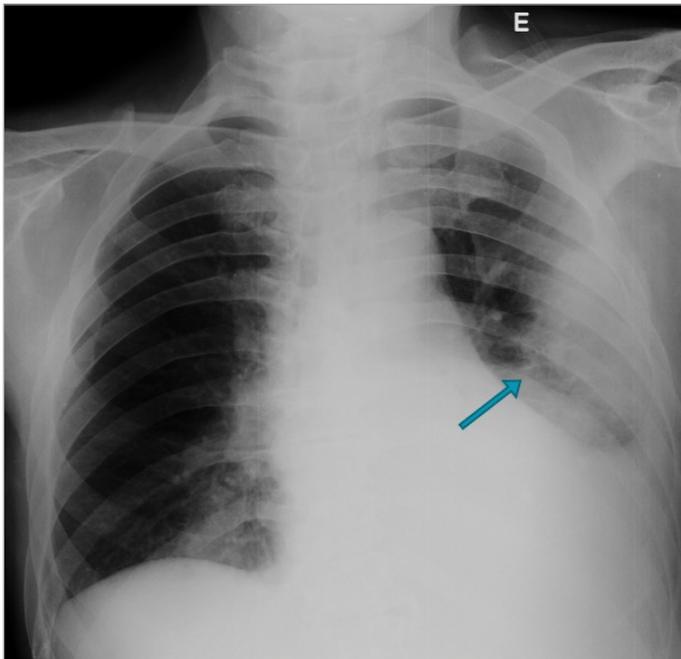
**Case Description:** A 59-year-old male patient with a history of smoking and alcoholism, presented to the Emergency Department with asthenia, dyspnoea, cough with sputum, and left-sided chest pain with pleuritic characteristics evolving over a week. He denied fever or weight loss. On physical examination, the patient was notably lean, hypoxemic and tachycardic, pulmonary auscultation revealed absent vesicular murmur in the lower third of the left hemithorax, hepatic border located 2 cm below the costal margin, jugular distension at rest and generalized oedema.

**Clinical Hypothesis:** Pneumonia, cardiac failure, pulmonary embolism, malignant neoplasm.

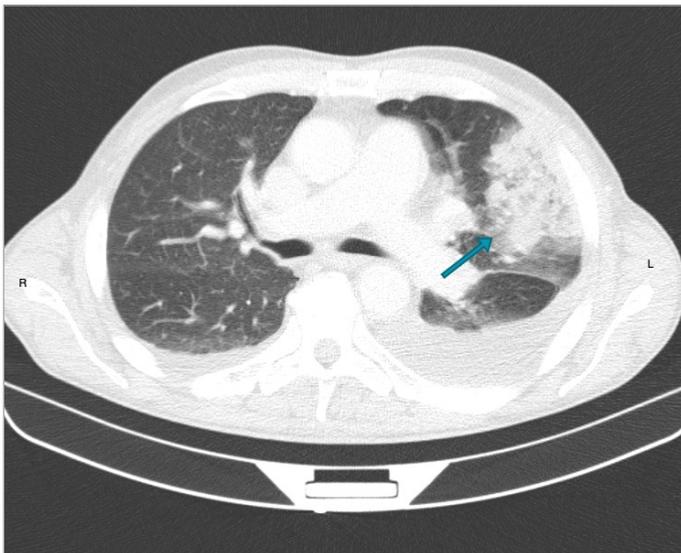
**Diagnostic Pathways:** Blood tests showed elevated C-reactive protein (124 mg/L), d-dimers (7284 ng/mL), proBNP (7549 pg/mL). Chest radiography revealed hypotransparency in the mid-region of the left lung. Due to suspicion of pulmonary neoplasia based on imaging characteristics eventually with associated pulmonary embolism, a chest CT angiography was performed, revealing that the suspicious image corresponded to pulmonary embolism with associated pulmonary infarction.

**Discussion and Learning Points:** This case underscores the importance of considering pulmonary infarction as a differential diagnosis in patients presenting with respiratory symptoms and atypical radiographic findings. Chest radiography appears abnormal in most cases of pulmonary embolism with pulmonary infarction, typically manifesting as a wedge-shaped opacity. Rarely, pulmonary infarctions may present as an image suggestive of pulmonary neoplasia. Timely recognition through advanced imaging techniques like CT angiography is crucial for accurate diagnosis and appropriate management of pulmonary embolism with associated pulmonary infarction.

**Keywords:** pulmonary embolism, pulmonary infarction



**Figure 1.** Chest Radiography showing left pleural effusion and a left hypotransparency (blue arrow) compatible with a mass.



**Figure 2.** Chest CT angiography reveals that the suspicious left mass on the chest radiography is, in fact, an extensive pulmonary infarction secondary to pulmonary embolism (blue arrow).

[Abstract:0912]

## THE ROLE OF BIOMARKER COPEPTIN IN ATRIAL FIBRILLATION

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**Background and Aims:** Atrial fibrillation (AF) is associated with an increased risk of morbidity and mortality. Arginine vasopressin (AVP) is a hormone that regulates fluid homeostasis, vasoconstriction, and the endocrine stress response. Copeptin is released in equimolar amounts with AVP in response to osmotic, hemodynamic, and stress stimuli. The role of copeptin as a marker of AF is unclear.

**Methods:** 100 patients admitted to the hospital due to AF (age  $73.15 \pm 11.42$  years, 44 males) and 50 healthy controls (HC) were included in this study. Biomarker levels were recorded upon admission.

**Results:** We found significantly higher levels of copeptin, troponin T (TnT) and N-terminal prohormone of brain natriuretic peptide (NT-proBNP) and lower serum sodium ( $p < 0.0001$ ) in the group with AF compared to HC. Copeptin levels were in significant positive correlation with serum sodium ( $r = 0.3288$ ,  $p = 0.0197$ ) only in HC group, and with NT-proBNP only in AF patients ( $r = 0.4745$ ,  $p < 0.0001$ ). Copeptin levels positively correlated with TnT in patients with AF ( $r = 0.4916$ ,  $p < 0.0001$ ) and in HC ( $r = 0.6046$ ,  $p < 0.0001$ ). Using multiple regression analysis, copeptin was the main factor predicting recurrence of AF.

**Conclusions:** We conclude that AVP and serum sodium concentration may participate in the pathogenesis of AF. The effect of AVP could explain the relationship between hyponatremia and AF in patients with heart failure. Therefore copeptin, as a marker of AVP production, may play a role in the prediction of AF in the general population.

**Keywords:** copeptin, arginine vasopressin, atrial fibrillation

[Abstract:0921]

## PERIPROCEDURAL DYNAMICS OF LV EF IN PATIENTS WITH FIRST MI AND PCI WITHOUT A HISTORY OF HF: PROGNOSTIC VALUE AND ASSOCIATIONS WITH THE DEVELOPMENT OF CARDIOVASCULAR COMPLICATIONS

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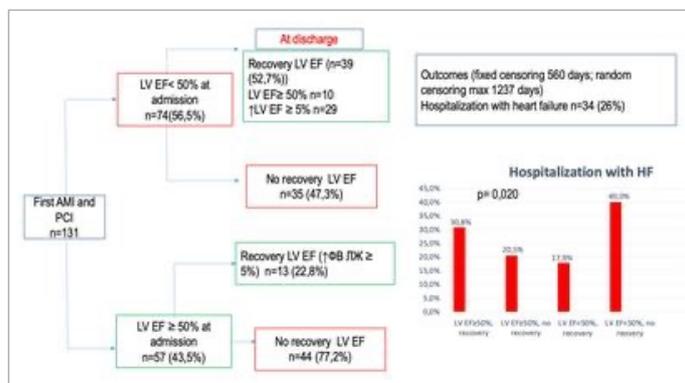
**Aim:** Evaluation of periprocedural dynamics of EF in patients with first acute MI and PCI without a history of HF and its prognostic value in the development of cardiovascular complications in the postinfarction period.

**Methods:** A prospective study included 131 patients with a first MI without a history of HF and successful PCI. EF was assessed before PCI and before discharge. The criterion for periprocedural improvement in EF is an increase >5%; in the group of patients with baseline EF<50%, an additional criterion is improvement in EF≥50%. Endpoint: hospitalization for HF, cardiovascular death during 1.5 years.

**Results:** The incidence of LV systolic dysfunction at admission was 56.5%. 47.3% of patients had no improvement EF after PCI in the group with baseline EF<50%; 22.8% of patients with initially normal EF had an increase after PCI.  $E/e' > 8.1$  (AUC 0.652,  $p=0.046$ ), and LAVi >34 ml/m<sup>2</sup> (OR 4.78;  $p=0.008$ ) in the group of patients with baseline EF less than 50% increases the chance of developing hospitalization with HF; which predictor in the group with baseline EF ≥ 50% is early LV filling velocity  $E > 0.495$  cm/s (AUC 0.727,  $p=0.011$ ). Lack of improvement in EF in the general group and with baseline EF <50% is associated with an increased risk of hospitalization with HF (by 3.46 and 7.13 times, respectively) and shortens the event-free survival time by almost 2 times.

**Conclusions:** In patients with first AMI and LV systolic dysfunction periprocedural assessment of EF is reasonable to stratify the risk of adverse cardiovascular outcomes.

**Keywords:** periprocedural dynamics EF, first MI, HF



**Figure 1.** Distribution of patients with AMI and PCI according to EF at admission and discharge. Development of patient outcomes depending on EF at discharge.

[Abstract:0925]

## IMMUNE-INFLAMMATORY AND GENETIC PROFILE IN PATIENTS WITH PERMANENT ATRIAL FIBRILLATION AND CORRELATION WITH STRUCTURAL DATA: A CROSS-SECTIONAL STUDY

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This study investigates the intricate relationship between inflammation and atrial fibrillation (AF) by examining whether inflammation is a cause or consequence of AF. A total of 82 patients with permanent AF and 82 healthy controls were enrolled. Plasma levels of inflammatory cytokines (sIL-2R $\alpha$ , TNF- $\alpha$ , IL-18, MCP-1, IL6, IL8) and serum levels of miRNAs associated with electric and structural remodelling (MiR1, MiR21, MiR26) were assessed. Transthoracic echocardiography (TTE) evaluated structural damage and left atrial strain. Compared to controls, AF patients exhibited a higher prevalence of hypertension and diabetes, elevated HbA1c, and microalbuminuria. Echocardiographic findings in AF patients included higher left atrial volume index (LAVI), lower ejection fraction (EF), and lower left atrial strain. AF patients also showed elevated serum levels of investigated cytokines. Spearman's analysis revealed correlations between echocardiographic variables and metabolic parameters. Interestingly, no significant differences were found in miRNA levels between AF patients and healthy controls. The study suggests that inflammation in AF is primarily a consequence of the arrhythmia itself rather than underlying structural heart disease. The authors hypothesize that AF induces multiple structural changes, driven by rapid activation and resulting in oxidative stress, myofibrillar protein damage, cellular myolysis, apoptosis, and local myocardial inflammation. These structural and electrophysiological remodelling processes contribute to AF persistence, emphasizing the metabolic nature of AF. Overall, the study provides additional evidence supporting the central role of inflammation in AF and offers insights into potential mechanisms underlying the complex interplay between inflammation, genetics, and structural damage in AF.

**Keywords:** atrial fibrillation, genetic, inflammation

[Abstract:0929]

## CLINICAL IMPLICATIONS OF IRON DEFICIENCY IN HEART FAILURE PATIENTS WITH PRESERVED LVEF: EXPERIENCE FROM AN INTERNAL MEDICINE CONTINUITY OF TREATMENT

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Iron deficiency is associated with worse clinical outcomes in patients with heart failure. the aim of this study was to evaluate clinical outcomes in patients with iron deficiency with heart failure and preserved LVEF, as well as treatment with ferroxymaltose iron in clinical prognosis in 14 months of follow-up.

**Methods:** We conducted a prospective cohort study between January 2021 and March 2022. Patients aged 65-85 years with CHF and LVEF  $\geq 50$  (LVEFp) were included. Patients undergoing cancer treatment and those with digestive pathology were excluded from the study. Iron deficiency was defined as ferritin  $< 100$   $\mu\text{g/L}$  or serum ferritin of 100-299  $\mu\text{g/L}$  with TSAT  $< 20\%$ .

**Findings:** A total of 76 patients were included in the analysis. The mean age was 83.4 ( $\pm 0.9$ ). The prevalence of anaemia was 63.1% (51.3 to 73.9), iron deficiency was 31.6% (21.3 to 43.2), combined prevalence of anaemia and/or iron deficiency was 69.7% (58.1 to 79.7), and 56.3% received treatment with ferroxymaltose iron. Multivariate analyses adjusted for age, sex, PROFUND Index, CONUT, and Barthel showed that participants with anaemia and iron deficiency treated with ferroxymaltose iron decreased emergency department attendance by 8% ( $\beta -0.08$ ,  $p < 0.05$ ), and a decrease in the number of admissions and deaths was also observed ( $-0.4$  and  $-0.8$ ), but the difference was not statistically significant.

**Conclusions:** In aging populations with a high prevalence of anaemia and iron deficiency, treatment with ferroxymaltose iron was associated with a decrease in emergency department visits. This was not associated with a reduction in hospital admissions or mortality.

**Keywords:** heart failure, iron deficiencies, anemia

[Abstract:0933]

## USE OF VEXUS AND PORTAL VEIN DOPPLER PULSATILITY IN PREDICTING ORAL DIURETIC RESPONSE

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**Purpose:** Venous congestion, can be evaluated with the Venous Excess Ultrasound (VExUS) grading system (Table 1). Because of

the mesenteric veins drains to the portal vein, we think that severe congestion of the portal vein may predict splanchnic congestion, intestinal wall oedema, and effectiveness of oral diuretics.

**Methods:** VExUS protocol was applied to the patients.

**Findings:** All 3 patients presented with pedal oedema and exertional dyspnoea. POCUS evaluations revealed heart failure with reduced ejection fraction (HFrEF).

**Case 1:** Inferior vena cava (IVC) diameter was measured as 3.2 cm. Hepatic, portal and intrarenal venous doppler showed severely abnormal pattern (VExUS grade3) (Figure 1).

**Case 2:** IVC diameter was measured as 2.9 cm. Hepatic and portal venous doppler showed a severely abnormal pattern, intrarenal venous doppler showed a mildly abnormal pattern (VExUS grade3) (Figure 1).

**Case 3:** IVC diameter was measured as 3.1 cm. Hepatic and intrarenal venous doppler showed a severely abnormal pattern, portal venous doppler showed a mildly abnormal pattern (VExUS grade3) (Figure 1). Oral diuretic treatment was started in all 3 patients. In Case 1 and Case 2, intravenous diuretic treatment was started due to lack of response to oral diuretic treatment. In Case 3, response was obtained to oral diuretic treatment.

**Conclusions:** We think that patients with severe abnormal pattern on portal venous doppler are unresponsive to oral diuretics, regardless of VExUS degree. Therefore portal venous doppler can be used in making the oral/iv diuretic decision. There is no study on this subject, and we think that our case series can give an idea about the studies that may be done.

**Keywords:** VExUS, oral diuretic response, portal vein doppler pulsatility

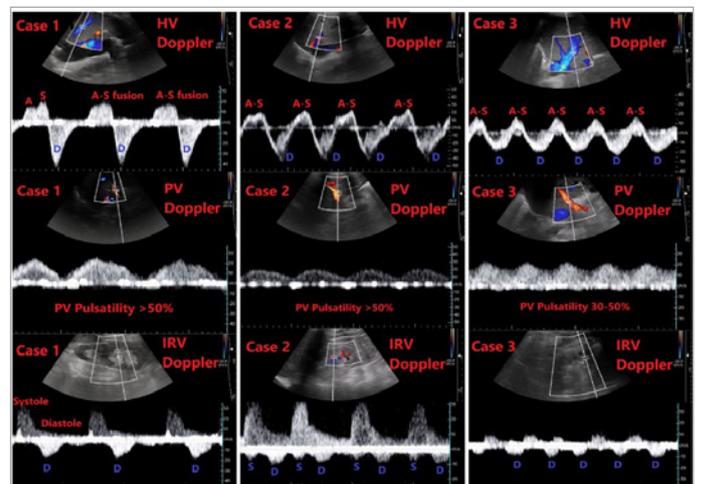


Figure 1. VExUS images of cases.

VExUS	Normal Pattern	Mildly Abnormal Pattern	Severely Abnormal Pattern
1) Inferior Vena Cava (IVC)	IVC < 2 cm	IVC ≥ 2 cm	IVC ≥ 2 cm
2) Hepatic Vein Doppler	A wave appears above the baseline. Systolic S and diastolic D waves appears below the baseline. and The S wave amplitude is greater than the D wave amplitude. "S>D"	A wave appears above the baseline. Systolic S and diastolic D waves appears below the baseline. and The S wave amplitude is smaller than the D wave amplitude. "S<D"	S wave is reversed and may fusion with A wave. Only D wave is seen below the baseline.
3) Portal Vein Doppler	Portal vein pulsatility is smaller than 30%	Portal vein pulsatility is 30% to 50%	Portal vein pulsatility is greater than 50%
4) Intrarenal Vein Doppler	Pulsatile arterial blood flow above the baseline. Continuous venous blood flow below the baseline.	Systolic S and diastolic D waves are seen below the baseline. "Biphasic Pattern"	S wave is reversed. Only D wave is seen below the baseline. "Monophasic Pattern"

**Table 1.** Venous Excess Ultrasound (VExUS) Grading System.

**Grade 0 (Normal):** IVC diameter <2 cm and no signs of venous congestion  
**Grade 1 (Mild) Congestion:** IVC diameter ≥ 2 cm and any combination of normal or mildly abnormal venous doppler patterns  
**Grade 2 (Moderate) Congestion:** IVC diameter ≥ 2 cm and at least one severely abnormal venous doppler pattern  
**Grade 3 (Severe) Congestion:** IVC diameter ≥ 2 cm and two or more severely abnormal venous doppler patterns.

[Abstract:0940]

### PREDICTIVE POWER OF 3D ECHOCARDIOGRAPHY PARAMETERS IN PATIENTS WITH FIRST MI AND SUCCESSFUL PCI

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The aim of the study is to evaluate 3D-EchoCG parameters and their predictive ability in patients with a first AMI and successful percutaneous coronary intervention (PCI) without an anamnesis of heart failure (HF).

**Methods:** A prospective single-centre study included 46 patients with a first MI without a history of HF and successful PCI. 3D parameters were assessed at discharge, the values of indicators were analysed modulo.

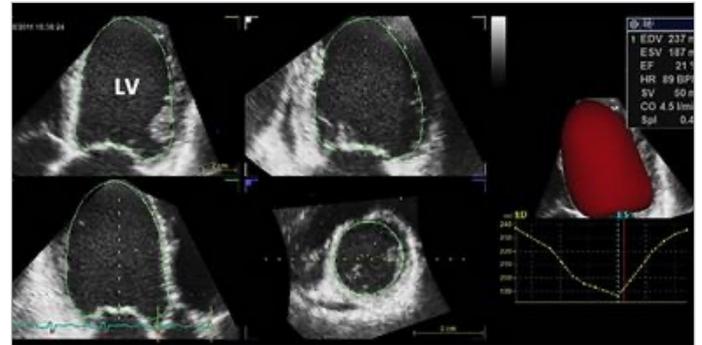
**Endpoint:** Hospitalization for HF, death from cardiovascular disease, combined endpoint. Median follow-up: 1.5 years.

**Results:** ST elevation MI was diagnosed in 12 patients, single-vessel disease in 14; hospitalization with HF was registered in 9 patients. A statistically significant increase in the LV sphericity index was found in patients with a registered outcome ( $p=0.025$ ). Predictors of hospitalization with heart failure in multivariate analysis were indicators of circumflexial strain (OR 0.40; 95% CI 0.20-0.80;  $p=0.010$ ) and areal strain (OR 0.60; 95% CI 0.41-0.89;  $p=0.012$ ). The predictors of hospitalization with HF in univariate analysis were circumflexial strain (OR 0.76; 95% CI 0.598-0.968;  $p=0.026$ ) and radial strain (OR 0.91; 95% CI 0.831-0.995;  $p=0.039$ ).

**Conclusions:** Evaluation of 3D-EchoCG parameters (circumflexial strain, areal strain, radial strain) at discharge from patients with first AMI and successful PCI without an anamnesis of HF can help

identify a group at high risk of developing HF in the postinfarction period.

**Keywords:** 3D echocardiography, first MI, HF



**Figure 1.** 3D echocardiography.

[Abstract:0944]

### JOINT PROGNOSTIC VALUE OF PERIPROCEDURAL DYNAMICS OF EF AND SUBCLINICAL PULMONARY CONGESTION DURING STRESS LUS IN RELATION TO THE DEVELOPMENT OF CARDIOVASCULAR COMPLICATIONS

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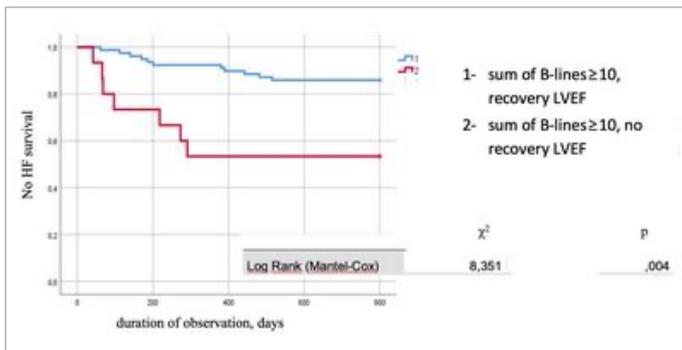
**Aim:** Assessment of the joint prognostic value of periprocedural dynamics (PD) EF and subclinical pulmonary congestion (PC) during stress LUS in patients with first AMI and PCI in HF.

**Methods:** A prospective study included 105 patients with a first AMI without a history of HF and PCI. All patients underwent Echo and stress LUS. The criterion of PD EF is an increase > 5%; in the group with baseline EF<50%, an additional criterion is improvement in EF≥50%. PC was diagnosed: mild (2-4 B-lines), moderate (5-9 B-lines) and severe (≥10 B-lines). The end point was hospitalization with HF during 1.5 years.

**Results:** Upon admission EF ≥ 50% was registered in 45 (42.9%) patients. In patients with EF<50, positive PD EF was registered in 31 (29.5%) patients. After stress LUS, 20 (19%) patients had mild PC, 38 (36%) moderate, and 47 (45%) severe. During the observation period, patients with no PD EF were significantly more likely to be hospitalized with HF (in 44.4% of cases) compared with patients with positive PD (in 15.2% of cases) and with an initial EF ≥ 50% (in 13.4% of cases) ( $p=0.005$ ). The best predictive ability was found in the combination of the absence of PD EF and the sum of B-lines ≥ 10 on exercise (RR 7.45;  $p<0.001$ ).

**Conclusions:** Evaluation of the combination of PD EF and the results of stress LUS at discharge in patients with first AMI and PCI without a history of HF reveals a group at high-risk HF in the postinfarction period.

**Keywords:** acute myocardial infarction, periprocedural dynamics, ejection fraction, stress LUS, heart failure



**Figure 1.** HF-free survival in patients with severe pulmonary congestion depending on periprocedural dynamics

[Abstract:0950]

## AN INCIDENTAL FINDING OF A PERSISTENT LEFT SUPERIOR VENA CAVA DURING PACEMAKER IMPLANTATION – CASE REPORT AND REVIEW OF LITERATURE

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**Summary:** Persistent left superior vena cava (PLSVC) is the most common congenital thoracic anomaly, with an estimated prevalence of 0.3-0.5% in the general population. It results from the failure of obliteration of the left anterior cardinal vein during normal embryogenesis. It is commonly associated with arrhythmias and conduction abnormalities due to dilated coronary sinus causing Atrio-ventricular node stretching.

**Purpose:** We present the case of a 47-year-old patient whose electrocardiogram showed complete heart block and was incidentally found to have a PLSVC during cardiac pacemaker implantation.

**Findings:** An alternative approach using the right axillary vein was attempted during the procedure of dual-chamber pacemaker implantation with successful implantation and no immediate complications.

**Conclusions:** The presence of a PLSVC is a challenging anatomy that is most commonly asymptomatic and is identified incidentally intra-operatively during invasive procedures such as cardiac pacemaker implantation and central venous catheter insertion. A pre-operative identification of a PLSVC through basic non-invasive diagnostic tests such as transthoracic echocardiogram may minimize the risks of potential complications during invasive procedures.

**Keywords:** cardiac, congenital, left superior vena cava

[Abstract:0953]

## RELIABILITY AND VALIDITY IN PREDICTING ADVERSE OUTCOMES OF VENOUS EXCESS ULTRASOUND SCORE: A SYSTEMATIC REVIEW

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**Summary:** The Venous Excess Ultrasound Score (Vexus), based on inferior vena cava (IVC) dilatation and pulsed-wave Doppler morphology of hepatic, portal, and intra-renal veins, has been proposed as a score to evaluate systemic congestion.

**Purpose:** This review aims to check reliability and validity in predicting adverse outcomes of Vexus score.

**Methods:** This review, based on the PRISMA guideline, explored the PubMed database. Inclusion criteria were studies on the reliability; accuracy in predicting death, re-admission, acute kidney injury (AKI) of the Vexus score. Three researchers selected studies using inclusion criteria and then assessed their quality using the QUADAS-2 guidelines. The key words for literature search were: point of care ultrasound and venous congestion.

**Findings:** We collected 65 studies: 57 excluded with reasons, 8 studies were included for the final analysis. We have not found studies on Vexus's reliability. In two studies Vexus score predicts AKI (HR=2.8, OR= 0.5), in one it does not (OR=0.4, p>0.05). One report suggested that Vexus does not predict 28-day mortality (OR=0.75, p=0.6) but one found that it predicts death heart failure related (AUC=0.89; Sens =92%, Spec= 79%, PPV=46%, NPV=96%). The score does not predict re-admission but high CVP (AUC=0.9) and fluid depletion by diuretic therapy; it correlates with CVP (r=0.68). The studies collected showed a moderate quality according to QUADAS-2 guidelines.

**Conclusions:** We found divergent conclusions on the Vexus's validity in predicting death and AKI. No data on reliability and few data on re-admission.

**Keywords:** ultrasound, venous congestion, Vexus score

[Abstract:0954]

## THE VALUE OF THE SHOCK INDEX IN INFECTIVE ENDOCARDITIS

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**Introduction:** Infective endocarditis is complicated with high morbidity and mortality. The initial evaluation in the emergency room is essential to determine the management of these patients. The objective of this work is to evaluate the prognostic value of Shock index and age shock index in the prediction of mortality. It's a prospective study from 2018 to 2022. Including patients over 18 years old treated for infectious endocarditis. Routine realization of a blood culture and a cardiac ultrasound. All patients were

hospitalized, clinical and para-clinical data were collected.

The Shock index (SI) is defined by the ratio of heart rate (HR) over systolic blood pressure (SBP) in mm Hg.

The age shock index (ASI) is calculated by multiplying SI by age. Patients were separated into two groups: surviving patients (G1) and deceased patients (G2). Thirty patients, age  $49 \pm 15$  years. Gender ratio 2.7

Medical history (%): venous drug addiction (54), hypertension (20), diabetes (20), haemodialysis (17), pacemaker (7).

Reason for consultation (%): Fever (77), deterioration in general condition (67), dyspnoea (83), cough (30), sweats (67).

Clinical presentation (%): Fever (77), purpura (24), Osler nodes (24), Janeway's erythema (13), left heart failure (50), right heart failure (33), shock (33), and arrhythmia (7).

Vegetations were tricuspid in 50% of cases, mitral in 37% of cases and aortic in 10% of cases.

Intra-hospital mortality was 56.7%. After study of the ROC graph: the SI  $> 1.08$  significantly predicts mortality with a sensitivity of 84.6% and a specificity of 83.3%. And the ASI significantly predicts mortality with a sensitivity of 69.2% and a specificity of 66.6%. The prognostic value of SI in predicting mortality is better than that of ASI.

**Keywords:** shock index, infective, endocarditis

	G1	G2	P
SI	$0.8 \pm 0.24$	$1.3 \pm 0.36$	0.007
ASI	$41.2 \pm 17,2$	$58.6 \pm 15$	0.041

Table 1 the comparison between the two groups.

[Abstract:0962]

## CLINICAL PRESENTATION, ETIOLOGY, OUTCOME OF INFECTIVE ENDOCARDITIS: ABOUT 60 CASES

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Despite major advances in diagnostic, antimicrobial and surgical management, infectious endocarditis (IE) remains a fatal disease, associated with serious complications and high mortality. The aims of this study were to describe the characteristics of patients with IE and to analyse the predictive factors of morbidity and mortality.

A retrospective study of 60 patients, admitted to the cardiology department of the military hospital of Tunis between 2005 and 2019 with a diagnosis of IE based on ESC 2015 diagnostic criteria. The average age was 45 years (sex ratio 1.6). The main symptom was the fever found in 91.7% of cases. 91.6% of the patients

had a heart disease, including 63.13% of rheumatic origin. IE on prosthesis was noted in 30%. Blood cultures were positive in 65%, the most frequently isolated germ was streptococcus in 56.4% and staphylococcus in 38.4%

Trans-thoracic and trans-esophageal echocardiography showed vegetations in 88.3% of patients, cardiac abscess in 31.6%, prosthesis disinsertion in 8.33%.

The complications were cardiac and vascular-embolic events found respectively in 43.33% and 28.33%.

All the patients were put under antibiotic treatment, the surgery concerned 53.3% of patients, in 84.4% of the cases the surgery was with a mainly hemodynamic indication. Overall mortality was estimated at 10%.

The predictive factors of morbidity and mortality, identified in our work, were dyspnoea, NYHA class (heart failure) and type of germ. The epidemiological, clinical and bacteriological profile has changed markedly in industrialized countries, this profile remains unchanged in developing countries including Tunisia where infective endocarditis preferentially affects young subjects with rheumatic heart disease and streptococcus the germ most frequently involved.

**Keywords:** infective, endocarditis, complications

[Abstract:0963]

## PECULIARITIES OF THE TREATMENT OF CONGESTIVE HEART FAILURE IN PATIENTS WITH DIABETES MELLITUS

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20-30% of patients with congestive heart failure (CHF) have diabetes that worsens prognosis. Use of sacubitril/valsartan (S/V) in patients with CHF reduces frequency of cardiovascular mortality and hospitalization. Aim of our study was to evaluate efficacy of long-term treatment with S/V in patients with CHF and diabetes.

59 patients with CHF were examined. 20 patients had concomitant type 2 diabetes. Patients were divided into 2 groups: first-composed 39 patients with CHF, and second - 20 patients with CHF and diabetes.

The initial dose of S/V was 24/26 mg twice a day. We increased dose when symptoms of CHF was increasing. Quitting of the titration and discontinuations was done when hyperkalaemia,

hypotension, bradycardia, and other side effects occurred during treatment. Both groups were evaluated before treatment and 3 months after treatment. Glucose, potassium, and creatinine in blood was determined, echocardiography, doppler echography and 6-minute walking test was done. Improvement in functional class, as well as decrease in frequency of heart rate was observed in both groups. Second group had higher blood glucose values both at baseline and after treatment. 3 months after treatment with S/V, left ventricular EF, cardiac index, and stroke volume was increased in both groups. Treatment with S/V showed similar clinical and hemodynamic positive effects in patients with CHF with or without diabetes. Improvement of clinical status was noted, as well as an increase in EF and decrease in EDV. Treatment with S/V showed a significant increase in the cardiac index, while the total PR was reduced in both groups.

**Keywords:** heart failure, diabetes mellitus, treatment, sacubitril/valsartan

[Abstract:0969]

## CLINICAL AND MORPHOLOGICAL COMPARISONS OF PATIENTS WITH TYPE 1 MYOCARDIAL INFARCTION AND TYPE 2 MYOCARDIAL INFARCTION

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**Purpose:** Type 2 myocardial infarction (T2MI) is a heterogeneous disease. A patient-centered approach and comprehensive assessment of comorbid pathology play a key role in the diagnosis, treatment, and prognosis of patients with T2MI. The tactics for managing T2MI must be individually determined, as timely diagnosis holds not only scientific but also practical interest.

- Examining the risk factors of T2MI (age, gender, comorbid pathology).
- Developing an algorithm for diagnosis and management of patients with T2MI in order to reduce the incidence of deaths in this group of patients.

**Methods:** Clinical and morphologic monitoring of COVID-19 patients hospitalized in 2021-2022 with type 1 myocardial infarction (T1MI) and T2MI, in accordance with the algorithm, developed and implemented by the Department of Therapy, Clinical Pharmacology and Emergency Medicine.

**Findings:** In 104 patients: 52 with T1MI, 52 with T2MI, 64 men (61.5%) and 40 women (38.5%) were aged 71±2.49 years. T1MI was most commonly observed in patients aged 60-74, while T2MI was more prevalent in patients aged 75-90. Hypertension occurred in 92% and 75%, respectively. Obesity occurred in

9.6% of patients with T1MI and 34% with T2MI. Patients with T2MI were significantly more likely to develop life-threatening complications: pulmonary embolism (7.7%), pulmonary oedema (22.1%), gastrointestinal bleeding (4.8%).

**Conclusions:** The majority of T2MI patients aged 75-90 had comorbid pathology. In patients with T2MI, life-threatening complications occurred in 1/3 cases. The algorithm for diagnosing and managing patients with T2MI should include analysis of risk factors and comorbid pathology at the pre-hospital stage.

**Keywords:** type 1 myocardial infarction, type 2 myocardial infarction, risk factors, comorbid pathology, pulmonary embolism, pulmonary oedema

[Abstract:0972]

## CLINICAL PRESENTATION, ETIOLOGY AND OUTCOME OF PROTHETIC VALVE ENDOCARDITIS

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Despite major advances in cardiovascular surgical techniques and routine use of prophylactic antimicrobial agents, prosthetic valve endocarditis (PVE) continues to complicate the course of a small percentage of patients after cardiac valve replacement.

The aims of this study were to describe the characteristics of patients with prosthetic valve endocarditis and to describe the evolution of this disease. A retrospective study of 60 patients, admitted to the cardiology department of the military hospital of Tunis between January 2005 and December 2019 with a diagnosis of IE based on ESC 2015 diagnostic criteria. Among these 60 patients, 21 patients had prosthetic valve. The microbial graft was on mitral valve prosthesis in 5 patients, aortic in 9 patients and mitroaortic in 4 patients. Three patients had, also, pacemaker. The IE was early in 7 patients. The main symptom was fever, present in 100% of patients. The microbiological profile: Streptococcus was found in: 8 patients, Staphylococcus was identified in 4 cases, in one case, Klebsiella was identified on blood culture. Meanwhile, the blood cultures were negative in 8 patients with only one serology was positive for brucellosis. Echocardiography: vegetations only in 11 cases, abscess in 2 cases, valves dehiscence in 5 patients and multiple lesions in 3 patients. All patients were treated by antibiotics, only 10 patients had valve replacement. There have been two cases of death. Prosthetic valve endocarditis (PVE) is one type of infectious endocarditis (IE). It accounts for 20% of all cases of endocarditis. It is important to achieve an early diagnosis and initiate the treatment as early as possible. The early diagnosis and initiation of treatment improves outcome and decreases complications and mortality.

**Keywords:** prothetic, valve, endocarditis

[Abstract:0980]

## ABDOMINAL AORTIC ANEURYSM: ROLE OF ULTRASOUND IN EMERGENCY MEDICINE

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**Introduction:** A ruptured abdominal aortic aneurysm represents a real surgical emergency. A rapid diagnosis is essential in a better surgical management.

The objective of this observation is to promote the place of ultrasound in the diagnostic strategy.

**Clinical Case:** We report the case of a 65-year-old hypertensive patient with stented coronary artery disease and dyslipidaemia who was presented to the emergency room for diffuse abdominal pain. On examination he had pressure blood pressure at 71/39 mmHg, tachycardia at 110 bpmn and peripheral signs of shock. The patient did not present with respiratory or neurological distress. The abdomen was tender, presence of a throbbing umbilical mass. The patient was put on vasoactive drugs, permissive hypotension was recommended. Faced with the suspicion of a complicated aneurysm of the abdominal aorta, a bedside ultrasound was performed by the emergency doctor showing a heterogeneous rounded image in the periphery and anechoic in the centre of 78 mm in diameter. Abdominal CT angiography revealed an aneurysm of the subrenal abdominal aorta of 80 mm in diameter extended to 82 mm in height and to the arteries iliac bones, signs of rupture with intrabdominal effusion and retroperitoneal hematoma. There was an indication for surgery, the patient was transferred to the operating room for open surgery.

The evolution was marked by the worsening of his hemodynamic state. He suffered a cardiorespiratory arrest despite resuscitation measures.

**Conclusions:** Bedside ultrasound remains an accessible, easy-to-perform non-invasive method, its performance diagnosis is excellent especially in patients who are unstable for transport to the imaging room.

**Keywords:** Abdominal aortic, aneurysm, ultrasound

[Abstract:0986]

## IS IT POSSIBLE TO EXTEND THROMBOLYSIS TO HIGH INTERMEDIATE RISK PULMONARY EMBOLISMS: REPORT OF A CASE

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Numerous studies have evaluated the place of thrombolysis in the management of serious pulmonary embolisms (PE).

**Clinical Case:** Mr AM aged 37, operated on for leg fracture a month ago, on anticoagulant dose preventive, consults for dyspnoea and bilateral basithoracic pain. On examination, he had polypnea (33),

crackles at both lung bases, desaturation (66), blood pressure was 130/80 mmHg. A left lower limb cast was in place. The patient was conscious, feverish at 38.5°C. The electrocardiogram showed tachycardia.

Arterial gas measurements noted hypoxemia, hypocapnia with an alveolar-arterial gradient of 45 mmHg.

PE was probable. However, hypoxemic pneumonia remains to be considered.

The patient was initially put on oxygen therapy via high concentration mask with double antibiotic therapy and intravenous anticoagulant at a curative dose. Chest CT angiography: bilateral proximal pulmonary embolism, left basal pulmonary infarction and pneumonia in both lower lobes. The simplified PESI score was 2. Troponins were 350 ng/ml with right ventricular dysfunction. This was a high intermediate risk PE with bilateral pneumonia.

The evolution was marked by the increase in oxygen requirements, the persistence of a stable hemodynamic state, a good state of consciousness and an absence of multi-organ failure. The patient was placed on non-invasive ventilation, an antibiotic escalation was recommended on the 3<sup>rd</sup> day of his hospitalization.

Given the persistence of hypoxemia, thrombolysis was justified and administered on the 6<sup>th</sup> day of his hospitalization. The evolution was marked by an improvement in his respiratory condition, discharged on a vitamin K antagonist on the 12<sup>th</sup> day of his hospitalization.

**Conclusions:** In the absence of other therapeutic alternatives in hemodynamically stable patients with profound hypoxia despite adequate oxygen therapy, thrombolysis could be indicated while considering the haemorrhagic risk.

**Keywords:** thrombolysis, high intermediate risk, embolisms

[Abstract:1000]

## DIFFERENCES IN INFLAMMATORY PARAMETERS IN PATIENTS WITH ACUTE CORONARY SYNDROME

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**Objectives:** Inflammation has a pivotal role in the pathogenesis of atherosclerosis and its complications. The aim of the research is to evaluate the relationship between inflammatory parameters in acute coronary syndrome

**Methods:** The study was conducted as a cross-sectional study which included 100 patients with the diagnosis of acute coronary syndrome. They were divided into two groups: 50 patients with the acute myocardial infarction (AMI), and 50 patients with the unstable angina pectoris (UAP). Laboratory tests were conducted

using standardized methods. Collected data were processed using SPSS (Statistical package for Social Sciences) version 19.0

**Results:** Patients in AMI group were older with mean age of  $68.3 \pm 11.3$  as compared to the patients in UAP group with mean age of  $66.8 \pm 12.3$ , with no statistical significance ( $p = 0.511$ ). Serum levels of high-sensitivity Troponin I (hsTnI) were significantly higher in patients with acute myocardial infarction ( $14197.2$  pg/mL) comparing to patients with unstable angina. ( $64.9$  pg/mL) ( $p < 0.0005$ ). Serum level of CRP was higher in patients with AMI ( $7.2$  mg/L), comparing with the ones with UAP ( $1.9$  mg/L) ( $p < 0.0005$ ). Higher values of neutrophils, monocytes and neutrophil/lymphocyte ratio- N/L R were found in patients with AMI, comparing to those with UAP (Neu  $5.5 \times 10^9/L$  vs.  $3.7 \times 10^9/L$ ,  $p < 0.0005$ ; Mon  $1.37 \times 10^9/L$  vs.  $1.15 \times 10^9/L$ ,  $p = 0.018$ ; N/L R  $4.1 \times 10^9/L$  vs  $2.35 \times 10^9/L$ ,  $p = 0.001$ ).

**Conclusions:** CRP, leukocytes, neutrophils, and neutrophil / lymphocyte ratio can be used to assess the degree of inflammation and severity of coronary disease

**Keywords:** acute coronary syndrome, inflammation, C-reactive protein

[Abstract:1052]

## THE DIVERSITY OF ORTHOSTATIC REACTIONS IN PATIENTS WITH ACUTE DECOMPENSATED HEART FAILURE

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**Objective:** To evaluate orthostatic hypotension (OH) and hypertension (OHtn) in patients with ADHF.

**Design and Methods:** In 105 patients admitted to the HF centre with ADHF (60% male,  $68.2 \pm 13$  years, HTN 88.6%, post-MI 42.9%, EF 45% (35;54%), NT-proBNP 1393 (559;2630) pg/ml); HFrEF in 33.3%, HFmrEF-29.5%, HFpEF-37.1%). SBP and DBP were measured in recumbent and standing position within 3 min of standing (admission and discharge). OH was defined as decrease in SBP  $\geq 20$  mmHg and/or DBP  $\geq 10$  mmHg within 3 min of standing. The same increase in SBP and/or DPB was considered as OHtn.

**Results:** Among 31.4% of pts with orthostatic reactions (OR) at admission OH occurred in 21.9%, OHtn-in 9.5%. In OH group changes of both SBP/DBP occurred in 13.6%, SBP-in 18.2%, DBP-in 68.2%; in OHtn-45.5%, 18.2% and 36.4% respectively. OR at 1<sup>st</sup> minute occurred in 90.9% OH cases and in 54.5% OHtn cases. At discharge OH occurred in 17.1%, OHtn in 6.7%. At admission OR occurred in 40% pts with HFrEF (OH 25.7%); 29% pts with HFmrEF (OH 19.4%) and 25.6% pts with HFpEF (OH 20.5%). In pts with OH the HF phenotypes were as follows: HFrEF 40.9%, HFmrEF 27.3%, HFpEF 31.8%; in OHtn-45.5%, 27.3% and 27.3% respectively. The frequencies of OR at discharge were

also similar.

**Conclusions:** OR in pts with ADHF were diverse with predominance of OH, mostly isolated diastolic, with most reactions occurred within 1st minute of standing and with no differences across HF phenotypes.

**Keywords:** orthostatic hypotension, hypertension, acute decompensated heart failure

[Abstract:1061]

## TIPIC SYNDROME: A CASE REPORT

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**Objectives:** TIPIC (transient perivascular inflammation of the carotid artery) syndrome is a rare radioclinical entity. It is characterized by high unilateral cervicalgia, spontaneous or aggravated by palpation of a very localized perivascular inflammatory infiltrate at the level of the carotid bifurcation, observed on radiology.

**Materials and Methods:** We report the case of Mrs. S. C., 23 years old, who was presented with TIPIC syndrome. She developed sudden intense right unilateral cervicalgia without triggering factors. Examination of the cervical region reveals pain in the right carotid region, exacerbated during palpation, without swelling or vascular murmur. Pulses are perceived bilaterally and symmetrically. A supra-aortic trunk angiogram reveals tissue thickening around the right carotid bifurcation, causing isolated bulbous stenosis estimated at 60%, without inflammatory syndrome. The search for Takayasu's vasculitis, including thoracic, abdominal, and upper limb CT scans, shows no abnormalities.

**Results:** The patient received anti-inflammatory treatment for two weeks. A total regression of cervicalgia was noted, despite the persistence of radiological signs on cervical angiogram.

**Discussion:** TIPIC syndrome is an entity of unknown aetiology, which can rarely be associated with an autoimmune disease. Cervicalgia can regress spontaneously or with anti-inflammatory treatment, but recurrences remain frequent.

**Conclusions:** TIPIC syndrome is a poorly recognized and underdiagnosed entity by practitioners, leading to a multitude of additional examinations.

**Keywords:** TIPIC, syndrome, carotid, artery

[Abstract:1078]

## ASSOCIATION OF SERUM URIC ACID TO SERUM CREATININE RATIO WITH HOSPITALIZATION FOR CARDIOVASCULAR DISEASES

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The association between serum uric acid (SUA) and cardiovascular diseases (CVDs) has been investigated and some reports indicated such an association. Serum creatinine (sCr) is another independent indicator of cardiovascular risk as well as an indicator of renal function. Thus, the relationship between SUA and sCr can be used as a new variable in order to investigate the risk of CVDs. To improve the management of elderly patients with CVDs, it is necessary to determine the effect of the SUA/sCr ratio on the risk of hospitalization.

**Purpose:** To evaluate the significance of the SUA/sCr ratio in relation to hospitalization of elderly patients for CVDs.

**Methods:** The study included 72 patients (55% F) aged 60 to 88 years with heart failure. The patients also had arterial hypertension (94%), coronary heart disease (74%), and atrial fibrillation (40%). 64% of patients had chronic kidney disease. They underwent a comprehensive clinical and laboratory examination, which included determination of the level of SUA and sCr.

**Findings:** The SUA/sCr ratio varied from a minimum value of 1.8 to a maximum value of 7.5, the mean value was 3.8, the standard deviation was 1.15.

In the process of correlation analysis, a statistically significant positive relationship was revealed between the SUA/sCr ratio and hospitalizations for CVDs ( $r=0.24$ ,  $p=0.037$ ).

**Conclusions:** In elderly patients with CVDs, a positive correlation was found between the SUA/sCr ratio and hospitalization for CVDs, indicating the possibility of using this value to improve the prognosis management of such patients. However, this aspect requires further study.

**Keywords:** cardiovascular diseases, creatinine, uric acid, heart failure

[Abstract:1098]

## CRONIC HEART FAILURE: CAN THE GUIDELINES BE APPLIED TO REAL PATIENTS?

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**Purpose:** We planned to analyse the clinical characteristics of patients admitted to our hospital for heart failure (HF) and review

the treatment upon hospital discharge and its adaptation to the latest guidelines.

**Methods:** Observational-retrospective study of patients admitted to our hospital with the diagnosis of HF since January to May 2023. We collected sociodemographic data, Profund index, type of HF according to ejection fraction (HF with reduced ejection fraction (HFrEF); and HF with preserved ejection fraction (HFpEF), treatment at discharge, mortality, and readmissions.

**Findings:** We reviewed 69 medical records, of which 74% corresponded to Internal Medicine (IM). The mean age was 82 years. The mortality was 15% and the readmission rate within one year was 80%. 49% of the patients had HFpEF. 71% of patients had a medium risk in Profund index. Regarding treatment after discharge, only 4% of patients could be optimized with the quadruple therapy.

**Conclusions:** Quadruple therapy is now mandatory for all the patients with HFrEF since it has proven to reduce death and hospitalizations. Patients with HF admitted to IM represent a challenge for the clinician due to their high complexity; compared to Cardiology patients, they are older and have a higher Profund index, which could explain the lower optimization of the treatment of some first-line drugs. Given the improvement in morbidity and mortality with quadruple therapy, we should insist on optimizing treatment. As well as carrying out early follow-up of these patients, trying to improve adherence by monitoring adverse effects and gradually implementing doses.

**Keywords:** heart failure, Profund scale, treatment, HFpEF

[Abstract:1104]

## ORAL CONTRACEPTION AS A CAUSE OF MASSIVE PULMONARY THROMBOEMBOLISM?

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**Introduction:** Pulmonary thromboembolism can present in different forms and could be fatal. The aetiology of pulmonary thromboembolism is often associated with Virchow's triad and the pathophysiological mechanisms that trigger it.

**Clinical Case:** A 27-year-old woman with a history of hypertension and aortic bicuspidia with mild to moderate aortic regurgitation and severe aortic coarctation that underwent aortic angioplasty in 2014. Daily intake of combined oral contraceptive. She was a sporadic smoker and maintained a sedentary lifestyle. The patient went to the Emergency Department for worsening dyspnoea, retrosternal pain with radiation to the right upper limb, and an episode of syncope with spontaneous recovery. At physical examination, pallor and cold extremities, hypotension and tachycardia, and type 1 respiratory failure with hypocapnia. Electrocardiographically, with S1Q3T3 pattern, analytically with elevation of D-dimers and

high-sensitivity troponin. Thoracic angiography showed bilateral massive thromboembolism. Transthoracic echocardiogram revealed severe dilatation of the right cavities with moderate to severe impairment of right ventricular systolic function with PSAP of 70 mmHg. So, she presented a PESI Score of 117 points - Risk Class IV (high risk). Hypocoagulation was initiated, oral contraceptives were discontinued. From the study performed, it could not be found venous thrombosis in the lower limbs, autoimmune alterations, thrombophilias or other causes. The patient remained hypocoagulated with low molecular weight heparin and, subsequently, rivaroxaban.

**Discussion:** In young patients, clinical syncope, dyspnoea or thoracalgia should raise the suspicion of venous thromboembolism. In women of childbearing age, the use of oral contraception is a cause to be taken into account.

**Keywords:** pulmonary thromboembolism, oral contraceptives, syncope

[Abstract:1131]

## MYOCARDITIS AND SKIN RASH: WE SHOULD NOT FORGET IATROGENICITY

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**Purpose:** To highlight the importance of ruling out myocarditis as the aetiology of heart failure symptoms in all patients diagnosed with DRESS syndrome (drug rash with eosinophilia and systemic symptoms).

**Methods and Findings:** Our patient is a 60-year-old woman with a history of polycystic kidney disease and high blood pressure (treated with lisinopril); due to hyperuricemia, allopurinol was started. Two weeks later, a pruritic rash appears on the abdomen (without affecting the mucous membranes). Allopurinol was then suspended, and corticosteroids and antihistamines were started, significantly improving the lesions. However, the patient mistakenly takes allopurinol again, the lesions spreading to the entire body surface and appearing progressive dyspnoea and oedema of the legs. In the analysis, it stands out NT-proBNP 2670 pg/mL, ultrasensitive troponins 259 ng/dL and 1700 eosinophils/microliter. Echocardiogram shows basal septal hypertrophy, mild tricuspid regurgitation, and preserved ejection fraction.

The patient is discharged after removing allopurinol and adding corticosteroids. Subsequently, the complete disappearance of the rash and the signs of heart failure are confirmed. Finally, she is diagnosed of "Subacute myocarditis due to DRESS syndrome in the context of taking allopurinol".

**Conclusions:** DRESS syndrome is a hypersensitivity reaction due to the ingestion of drugs (frequently allopurinol). It usually causes fever, skin rash, eosinophilia, lymphadenopathy and/or alteration of the lung, liver, or kidney.

Although cardiac involvement is rare, myocarditis should be ruled out in all patients with this syndrome and symptoms of heart failure. A normal echocardiogram does not rule out such involvement (the acute necrosis phase can cause only slight interventricular hypertrophy).

**Keywords:** DRESS, myocarditis, allopurinol

[Abstract:1182]

## DYNAMICS OF LOW-DENSITY LIPOPROTEIN LEVELS IN THE POPULATION BEFORE AND DURING COVID-19 PANDEMIC

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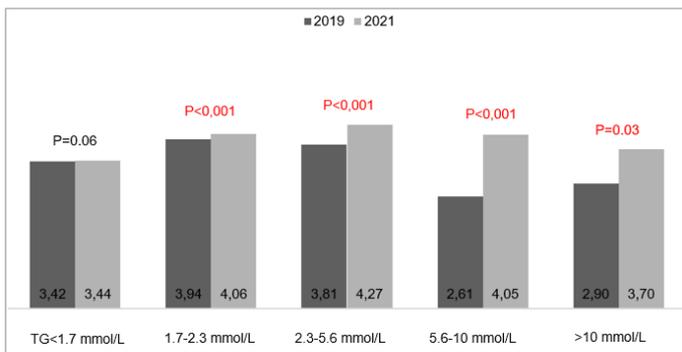
**Purpose:** To explore the dynamics of low-density lipoprotein cholesterol (LDL-C) levels using large data sets of private laboratories from all over Russia - before and during the COVID-19 pandemic.

**Methods:** The integrated database of private Russian laboratories was subjected to a cross-sectional analysis. Data of 31.519 patients over the age of 18 were analysed in two sections: 8.569 subjects (60.71% females) - in 2019, and 22.950 subjects (62.95% females) - in 2021. Patients' lipid profiles including triglycerides (TG), LDL-C and other biochemical parameters were analysed. All patients were stratified into 5 groups based on TG levels as a marker of residual risk (<1.7, 1.7-2.3, 2.3-5.6, 5.6-10 and >10 mmol/l).

**Findings:** Patients median age in the 2019 cohort was 49 [38-62] years, in the 2021 cohort - 45 [35-57] years. LDL-C levels increased significantly in 2021 cohort as compared to 2019 - from 3.51 [2.78-4.33] to 3.59 [2.93-4.31],  $p < 0.01$ . The difference remained significant after adjustment for age and gender. The proportion of subjects with LDL-C exceeding 3 mmol/L has increased from 67.6 to 72.5%. All 5 groups (stratified by TG levels) showed an increase in LDL-C, however, the most pronounced increase in LDL-C was documented in groups with TG levels > 2.3 mmol/l (Figure 1).

**Conclusions:** A difficult-to-explain negative dynamics of lipid profile indicators was found during the COVID-19 pandemic, characterized by significant increases in LDL-C levels. These findings require deeper analysis and thorough evaluation, while lipid profiles of individuals with suspected COVID-19 in their history should be adequately monitored.

**Keywords:** LDL-C, triglycerides, COVID-19, dyslipidaemia



**Figure 1.** Median LDL-C levels in groups stratified by TG concentrations. Note: p-levels for Mann-Whitney test; TG - triglycerides; LDL-C - low-density lipoprotein

[Abstract:1196]

## THE SIGNIFICANCE OF HIGH-SENSITIVITY C-REACTIVE PROTEIN LEVELS IN PATIENTS WITH MULTIFOCAL ATHEROSCLEROSIS – DATA OF KAMMA INTERNATIONAL REGISTRY

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**Purpose:** To evaluate significance of high-sensitivity C-reactive protein (hs-CRP) levels in patients with multifocal atherosclerosis (MFA).

**Methods:** To evaluate the progression of MFA, a working group of the Eurasian Association of Internal Medicine set up an international multicentre non-intervention clinical practice registry KAMMA (NCT05189847). The main branch included data for 1837 patients; hs-CRP level was determined in 929 persons (62.11% (n=577) of them were men). To perform a comparative analysis, all subjects were divided into 2 groups according to hs-CRP level: (I) less than 2 mg/l (n=381) and (II) from 2 mg/l to 4.99 mg/l (n=547).

**Findings:** Group II patients were significantly younger, had higher values of body mass index, and total cholesterol, triglycerides and non-HDL levels. When analysing cardiovascular comorbidities, it was established that patients from group II had a higher incidence of atrial fibrillation, transient ischemic attacks, and deep vein thrombosis. Subjects in this group also had more progressive forms of arterial hypertension and less severe functional classes (FC) of chronic heart failure. In the meantime, there were no significant differences in the prevalence of coronary heart disease, type 2 diabetes, past myocardial infarction, and cerebrovascular accidents.

**Conclusions:** Determining hs-CRP levels in younger MFA patients

may be important as an additional marker of risk and comorbidity for cardiovascular disease, dyslipidaemia, and obesity. To establish a more accurate prognostic value of hs-CRP in patients with MFA, more complex models are necessary alongside with verification of the data obtained in an analysis of KAMMA registry endpoints.

**Keywords:** KAMMA registry, multifocal atherosclerosis, hs-CRP

Parameter	hs-CRP < 2 mg/l (n=381)	hs-CRP 2-4.99 mg/l (n=547)	p-level
Age (years)	67 [59;73]	64 [59.5;71]	0.023
Body mass index, kg/m <sup>2</sup>	28.4	30.3	<0.001
Total cholesterol, mmol/l	4.6	5.2	<0.001
Triglycerides, mmol/l	1.4	1.5	<0.001
Non-HDL, mmol/l	3.4	3.8	<0.001
Hypertension, n (%)	366 (96.1)	528 (96.5)	0.577
Stage 1, n (%)	64 (17.5)	52 (9.8)	0.001
Stage 2, n (%)	92 (25.1)	180 (34.1)	0.008
Stage 3, n (%)	210 (57.4)	296 (56.1)	0.696
Atrial fibrillation, n (%)	32 (8.4)	77 (14.1)	0.008
Heart failure, n (%)	309 (81.1)	466 (85.2)	0.074
NYHA FC 1, n (%)	38 (12.3)	39 (8.4)	0.073
NYHA FC 2, n (%)	139 (45.0)	350 (75.1)	<0.001
NYHA FC 3, n (%)	131 (42.4)	75 (16.1)	<0.001
NYHA FC 4, n (%)	1 (0.3)	2 (0.4)	0.817
Transient ischemic attack, n (%)	22 (5.8)	110 (20.1)	0.817
Deep vein thrombosis, n (%)	2 (0.5)	18 (3.3)	0.004
Ischemic heart disease, n (%)	359 (94.2)	525 (96.0)	0.217
Type 2 diabetes mellitus, n (%)	121 (31.8)	177 (32.4)	0.826
Myocardial infarction, n (%)	168 (44.1)	259 (47.3)	0.328
Stroke, n (%)	44 (11.5)	71 (13.0)	0.499

**Table 1.** Comorbidities and lipid profile in MFA patients depending on hs-CRP levels.

[Abstract:1200]

## AN ONCOLOGICAL PATIENT WITH A HARD TO INTERPRET “PHANTOM” ATRIAL MASS. A CASE REPORT

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**Case Description:** A 57-year-old woman presented to the echocardiography laboratory after potentially cardiotoxic chemotherapy. She was asymptomatic for dyspnoea, palpitations, and syncope. No therapy was taken chronically. A few months earlier, she had been diagnosed with infiltrating lobular breast carcinoma and had undergone a right mastectomy and axillary dissection. Adjuvant chemotherapy with anthracyclines and taxanes and radiotherapy of the residual breast were performed. Transthoracic echocardiography (TTE) before therapy showed normal global systolic function with no other pathological findings. After four months, a post-therapy TTE was repeated, describing an isoechogenic, very mobile, soft mass, with irregular surface at fossa ovalis emergence on the left atrial side, not previously reported. The mass was of ambiguous interpretation.

**Clinical Hypothesis:** Given the medical history and the relatively higher frequency of secondary tumoral lesions among cardiac masses, a breast cancer metastasis was suspected. Other

diagnoses such as benign tumours, vegetations and clots had to be excluded.

**Diagnostic Pathways:** A transoesophageal echocardiogram requested to better investigate the mass, showed a 17 x 12 x 16 mm mass, with features suggestive of a myxoma. The patient then underwent cardiac surgery to remove the atrial mass. Histological examination confirmed an atrial myxoma.

**Discussion and Learning Points:** In a patient with a history of malignancy, all cardiac masses should be suspected as metastatic, but other possible diagnoses may be considered. Furthermore, careful, and comprehensive view of the cardiac chambers is mandatory when performing an echocardiogram, so that even the most insidious findings such as atrial masses are not missed.

**Keywords:** myxoma, atrial masses, breast cancers

[Abstract:1213]

## ASSOCIATION OF ARTERIAL BED LESIONS AND ANKLE-BRACHIAL INDEX IN PATIENTS WITH MULTIFOCAL ATHEROSCLEROSIS - DATA OF KAMMA INTERNATIONAL REGISTRY

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**Purpose:** To correlate atherosclerotic lesions in various arteries with the value of ankle-brachial index (ABI) in patients with multifocal atherosclerosis (MFA).

**Methods:** To evaluate the progression of MFA, a working group of the Eurasian Association of Internal Medicine set up an international multicentre non-intervention clinical practice registry KAMMA (NCT05189847). The registry included data for 3058 subjects. ABI was determined with standard method: in the majority of patients (59%; n=1803) was normal ABI (0.9-1.4), 39.8% (n=1217) had low ABI ( $\leq 0.9$ ), only 1.2% (n=38) had a high ABI ( $\geq 1.4$ ). This study provided a comparative analysis in patients with low and normal ABIs, and atherosclerotic lesions in the low ABI group.

**Findings:** Patients with low ABI were found to have significantly higher heart rate (HR), waist circumference, body mass index (BMI). Meanwhile no significant differences between the groups were identified in age, sex and blood pressure levels (Table 1).

Among the arterial beds presently considered, the study demonstrated a significant relation between low ABI and lesions of three beds: abdominal and renal vessels, the brachiocephalic trunk, lower limb arteries (Figure 1).

**Conclusions:** An analysis showed that low ABI values in MFA patients were associated with an increase in HR, waist circumference, and BMI. At the same time, a decrease in ABI was a factor leading to higher incidence of atherosclerotic lesions of the brachiocephalic trunk, abdominal and renal vessels, and lower limb arteries. The findings indicate a need for additional investigation of the diagnostic and prognostic value of ABI in MFA patients.

**Keywords:** KAMMA registry, multifocal atherosclerosis, ankle-brachial index

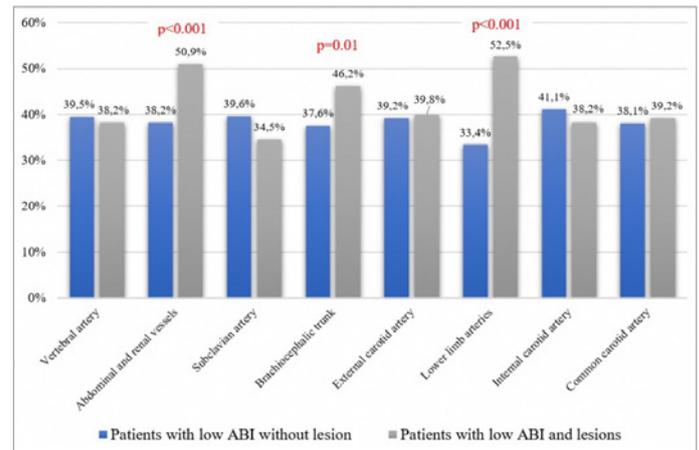


Figure 1. Interrelation of low ABI and volume of atherosclerotic lesions

	Low ABI (n=1217)	Normal ABI (n=1803)	p-value
Age, years	66 [61;72]	66 [58;73]	0.43
Female, n (%)	442 (36.3)	757 (42.0)	0.01
Systolic arterial pressure, mmHg	134 [125;145]	130 [124;140]	0.12
Diastolic arterial pressure, mmHg	80 [80;90]	80 [76;89]	0.07
Heart rate per min	73 [68;80]	70 [65;78]	<0.001
Waist circumference, cm	98 [89;106]	96 [87;104.8]	<0.001
BMI, kg/m <sup>2</sup>	29.8 [26.1;32.8]	29.1 [25.8;32.3]	0.03

Table 1. Data on medical examination of MFA patients depending on ABI.

[Abstract:1222]

## EVALUATION OF THE PENETRATION ANGLE AND HANDGRIP STRENGTH IN PATIENTS WITH HEART FAILURE

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**Introduction:** Sarcopenia is a strong predictor of frailty, disability, and mortality in individuals suffering from heart failure (HF). Therefore, the assessment of muscle mass is crucial.

This study aims to investigate the association between the

penetration angle in the rectus femoris muscle (RFM) and handgrip strength in patients with HF.

**Materials and Methods:** A retrospective observational study was conducted on patients admitted for decompensated HF to the Internal Medicine Department of the University Hospital of Navarra during October-November 2023. Evaluation included ultrasound measurements and handgrip strength measured by dynamometry.

**Results:** We enrolled 20 patients (M/F 12/8) with an average age of 79.8 years; 12 (60%) presented HF with preserved ejection fraction. The most common aetiology of HF was valvular (N=13, 65%) and ischemic heart disease (N=4, 20%). Decompensation aetiologies included infectious (N=9, 45%), anaemia (N=3, 15%), and atrial fibrillation (N=3, 15%).

The mean penetration angle was 10.37° (range: 5.2°-17.3°), and handgrip strength was 19.02 kg (range: 6.5-45.6 kg). We found that patients with a lower penetration angle had lower strength (t-student 14.755, P < 0.05, 95% CI 8.91-11.86). A summary of the data is provided in the table 1.

**Discussion and Conclusions:** Similar to other studies that have correlated low penetration angles of the gastrocnemius or deltoid muscles with sarcopenia, the rectus femoris muscle (RFM), due to its easy accessibility and assessment, could be valuable for implementing additional techniques for evaluating muscle strength and mass. However, further studies focusing on this muscle are necessary to validate these findings.

**Keywords:** angle penetration, heart failure, handgrip

	Penetration angle < 10°	Penetration angle > 10°
Weak handgrip	8	4
Normal handgrip	2	2
Strong handgrip	0	2

Table 1. Relation penetration angle and handgrip.

[Abstract:1226]

## ANKLE-BRACHIAL INDEX IN PATIENTS WITH MULTIFOCAL ATHEROSCLEROSIS - DATA OF KAMMA INTERNATIONAL REGISTRY

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**Purpose:** To study the relationship of the ankle-brachial index (ABI) with ultrasound findings in patients with multifocal atherosclerosis (MFA).

**Methods:** To evaluate the progression of MFA, a working

group of the Eurasian Association of Internal Medicine set up an international multicentre non-intervention clinical practice registry KAMMA (NCT05189847). Main branch of registry included 3058 adult men and women with confirmed atherosclerosis in two or more arterial bed. ABI was measured on both sides using a standard technique or an automatic method. All participants were divided into 3 groups: low ABI ( $\leq 0.9$ ), normal ABI (0.9-1.4), high ABI ( $\geq 1.4$ ). The high ABI group was too small for analysis, associations were established only for low and normal levels.

**Findings:** The ABI median was 0.96 [0.87;1.08]. The values of ABI were normal in the majority of patients with MFA - 59.0% (n=1803), low ABI was in 39.8% (n=1217) cases.

For involvement of brachiocephalic vessels (overall), subclavian and vertebral arteries, there was no significant difference between both groups. Upon separate analysis of each artery within the brachiocephalic group, the results were heterogeneous. Lower extremities arteries, abdominal aorta and renal arteries involvement, and right brachiocephalic trunk involvement were more common with low ABI (Table 1).

**Conclusions:** Patients with MFA most commonly exhibited normal ABI values. In patients with low ABI, involvement of the vessels of the lower extremities, abdominal aorta and renal arteries, as well as the right brachiocephalic trunk, but not all brachiocephalic arteries were more often recorded. The results obtained require further in-depth analysis.

**Keywords:** KAMMA registry, multifocal atherosclerosis, ankle-brachial index

Involvement area	Low ABI, % (n/ntotal)	Normal ABI, % (n/ntotal)	P-value
All brachiocephalic arteries	91.5 (690/754)	91.7 (1075/1172)	0.987
Lower extremities	62.9 (542/862)	43.1 (474/1099)	<0.001
Abdominal aorta and renal arteries	10.8 (85/787)	6.7 (81/1193)	<0.001
Common carotid artery	71.2 (640/898)	70.1 (968/1379)	0.83
Internal carotid artery	66.1 (593/896)	69.5 (948/1363)	0.10
External carotid artery	18.1 (154/850)	17.9 (231/1284)	0.36
Subclavian artery	10.4 (88/845)	12.5 (163/1296)	0.28
Right brachiocephalic trunk	14.5 (117/803)	10.2 (128/1246)	<0.001
Vertebral arteries	7.3 (63/856)	7.6 (99/1291)	0.79

Table 1. Distribution of artery involvement of different localizations depending on ABI level.

[Abstract:1235]

## IS A PATIENT WITH HAEMOPHILIA PROTECTED AGAINST ISCHEMIA?

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Haemophilia A is a rare autoimmune bleeding disorder in which antibodies attack clotting factor VIII. Although patients with

haemophilia have been thought to be protected against acute ischemic vascular events because of the hypocoagulant status, such events cannot be fully excluded. We report the case of a 34 y.o. hypercholesterolemic male, who presented in the E.R. department experiencing constricting chest pain which radiated towards the shoulders and cervical region after factor VIII administration. Primary evaluation showed a HR-74 bpm, BP-150/100 mmHg, SpO<sub>2</sub>-98%. ECG showed 1 mm ST segment elevation in leads V4-V6 and Q wave in leads DII, DIII and aVF. Elevated Hs Troponin levels: first 464.8 ng/L and 999.6 ng/L after 3 hours. The patient was admitted, and standard ACS medication was given. After admission the patient's complaints were relieved under medication but with rising Hs Troponin levels to 1602.3 ng/L. TTE showed lateral wall hypokinesis and a GLS of -10.7. Coronary angio-CT was performed and a soft atheromatous plaque which determined complete stenosis of the anterior descending coronary artery on the 7<sup>th</sup> segment 23 mm in length was revealed. The patient underwent a coronary angiography but due to the extensive lesions (complete blockage of ADC and RCA, 80% stenosis of DI and 70% stenosis MO 1) stent placement was not performed and the patient underwent double by-pass surgery for myocardial revascularization AMIS/ADA, GVS/OMI with good outcome. At discharge antiplatelet therapy with aspirin was recommended at a dose of 100 mg od.

**Keywords:** haemophilia, myocardial infarction, by-pass, VIII factor

[Abstract:1237]

## ORAL ANTICOAGULATION QUALITY DURING LOCKDOWN AND YEAR AFTER

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**Introduction:** Acenocumarol is mostly prescribed in patients with atrial fibrillation (AF) in Republic of North Macedonia, even if new oral anticoagulants are strongly recommended according to the present guidelines, from economic reasons.

**Purpose:** To evaluate the quality of oral anti-coagulant therapy (OAT) in COVID-19 and post COVID-19 period.

**Methods:** Retrospective, cross-sectional study from January 2020 till December 2022, Rosendaal method for calculating Time in therapeutical range (TTR).

**Results:** 90 patients with AF placed on acenocumarol with average age of 76 (±7.9). Average number of International Normalized Ratio (INR) results per year: 2020: 5.59 (±2.06), 2021: 6.93±1.60, 2022: 7.28±1.87. Average TTR values by year: 2020: 41.27%, 2021: 47.06%, 2022: 50.22%. Highest value of TTR 56.82% in group of 60–69-year-olds, lowest TTR 43.01% in group of

80–89-year-olds. Lowest INR values in spring 2.05 (±0.68) and summer 2.03 (±0.69), highest in autumn 2.3 (±1.03) and winter 2.25 (±0.88). Major bleeding in 9 patients (10%). Ischemic stroke was not detected.

**Conclusions:** We confirmed difference in average number of INR results per year 5.59±2.06 in 2020 and 7.28±1.87 in 2022 (p=0.0011), average TTR values by year 41.27% in 2020 and 50.22% in 2022 (p=0.19), difference in TTR values by age 56.82% in group of 60–69 year and 43.01% in group of 80-89-year-olds (p=0.003) and difference in mean INR values by season.

Person centered care (frequent follow-up and potential to adhere to prescribe therapy) leads patients to better choose and decisions that affect better health and wellbeing.

**Keywords:** rosendaal method, INR, acenocumarol

[Abstract:1274]

## CHARACTERISTICS OF PATIENTS WITH NONVALVULAR ATRIAL FIBRILLATION ANTICOAGULATED WITH VITAMIN K ANTAGONISTS IN AN INTERNAL MEDICINE DEPARTMENT OF A TERTIARY HOSPITAL

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**Summary:** Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia in adults worldwide. It is associated with significant morbimortality, which is a major burden for both patients and society.

**Purpose:** The aim of this study is to define the profile of patients with nonvalvular AF treated with vitamin K antagonists (VKA) and whether they were adequately controlled.

**Methods:** A retrospective descriptive study was conducted analysing the demographic variables and comorbidities of patients with nonvalvular AF anticoagulated with VKA (acenocoumarol or warfarin) discharged from the Internal Medicine Department of a tertiary hospital between March and May 2022. Patients who died during hospitalisation were excluded.

**Findings:** Of the 1,548 patients included, 12.4% had a diagnosis of AF and were taking VKA. The median age was 86 years, with 91.7% of patients > 75 years, and 54.7% were women. The most frequent comorbidities were: arterial hypertension (81.2%), heart failure (59.9%), diabetes mellitus (33.3%), anaemia (31.8%) and peripheral artery disease (13.5%). Regarding previous history of thrombotic events, 16.7% had a history of cerebrovascular disease, 15.1% of pulmonary embolism, and 10.9% of acute myocardial infarction. The median INR on admission was 2.71

and time in therapeutic range (TTR) was 58.6%, being 53.7% of patients under < 60%. The median CHADS2-VASc scale was 5 and 71.2% of patients had a high-risk HAS-BLED scale.

**Conclusions:** The prevalence of nonvalvular AF on VKA was 12.4% in this tertiary hospital. Most patients were older women with multiple comorbidities. The majority had suboptimal TTR and high risk of bleeding.

**Keywords:** nonvalvular, atrial, fibrillation

[Abstract:1322]

## PROGNOSIS OF PATIENTS WITH NONVALVULAR ATRIAL FIBRILLATION WITH INDICATION FOR ANTICOAGULANT CHANGE

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**Summary:** Direct oral anticoagulants (DOACs) are preferred to vitamin K antagonists (VKAs) for stroke prevention in nonvalvular atrial fibrillation (NVAf). In our region, DOACs are only covered for patients with poor time in therapeutic range (TTR) or high bleeding risk on VKAs.

**Purpose:** This study aimed to assess the indication for change to DOACs in patients with NVAf treated with VKAs, whether the switch was made and the prognosis at 6 months.

**Methods:** A retrospective descriptive study was conducted, including patients discharged from the Internal Medicine department of a tertiary hospital between March and May 2022 with NVAf treated with VKAs.

**Findings:** Of the 192 patients included, 52.4% had an indication for anticoagulant change: 88% for TTR under 60%, 30% for high risk of intracranial haemorrhage and 15% for history of intracranial haemorrhage. In 88% of these patients, the switch was not made. Of the total patients, 8.8% changed to DOACs.

Patients with TTR under 60% were more likely to have a high-risk HAS-BLED score ( $p < 0.001$ ) and have a higher mortality at 6 months (20.5% vs 7.8%,  $p = 0.021$ ). In those patients that anticoagulation was not changed, 19.3% went to the emergency room and 17% required hospitalisation in the following 6 months. However, there were no significant differences in mortality between patients who were switched to DOACs and those who were not.

**Conclusions:** A minority of patients were switched to DOACs, although most of them had an indication. This could be associated with a worse overall prognosis.

**Keywords:** indication, change, VKA

[Abstract:1331]

## DILEMMA IN THE FACE OF A DIRE CONFLUENCE: SEVERE BIVENTRICULAR DYSFUNCTION WITH AORTIC ANEURYSM AND PULMONARY THROMBOEMBOLISM

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**Case Description:** A 57-year-old man was admitted with heart failure (HF) NYHA III. Echocardiogram demonstrated biventricular dysfunction (ejection fraction 30% and fractional area change 30%), significant aortic insufficiency and pulmonary artery systolic pressure (PASP) of 52 mmHg. Computed tomography angiography (CTA) of the chest detected bilateral pulmonary artery thromboembolism (PTE) and aortic aneurysm (65 x 55 mm). It was initially decided to treat HF and PTE for 6 months, with clinical monitoring of the aneurism. After this period, right catheterization showed PASP of 37 mmHg and new CTA revealed complete resolution of the PTE.

**Clinical Hypothesis:** A 65 mm aortic aneurysm with significant aortic insufficiency associated with extensive PTE and severe biventricular dysfunction.

**Diagnostic Pathways:** Diagnosis was conducted through echocardiography and computed tomography angiography of the chest.

**Discussion and Learning Points:** It is known that biventricular systolic dysfunction and pulmonary hypertension increase in-hospital mortality in patients undergoing aortic surgery by fourteen times and five times, respectively. However, the risk of aneurysm dissection exponentially increased in diameters above 55 mm. For decision-making, we considered the high risk of rupture and progressive worsening of HF, compromising the quality of life in a relatively young patient. The patient was informed about the risks and benefits and opted for surgical treatment. Biological aortic valve implantation was performed with cardiopulmonary bypass time of 157 minutes, without any significant complications. He was discharged from hospital after 30 days and is currently undergoing 6-month follow-up at NYHA I.

**Keywords:** aortic aneurysm, pulmonary thromboembolism, cardiovascular surgery

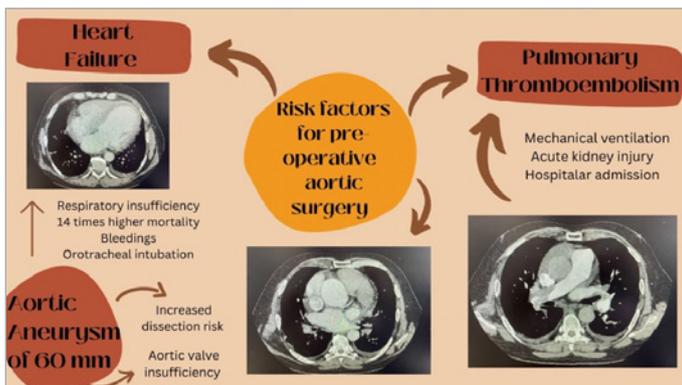


Figure 1. Risk factors for pre-operative aortic surgery

[Abstract:1336]

## FIVE-YEAR FOLLOW-UP OF A PATIENT WITH MULTIFACTORIAL HEART FAILURE DECOMPENSATED BY CHIKUNGUNYA

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**Case Description:** Female, 63 years old (yo), obese, with hypertension and diabetes mellitus for 15 years and a history of breast cancer treated with chemotherapy and radiotherapy at 43 yo. Admitted at 58 yo presenting with heart failure (HF) NYHA IV and symptoms suggestive of Chikungunya. Support measures were taken and medications for HF were optimized. After 5 years of follow-up, remaining in NYHA I.

**Clinical Hypothesis:** HF of multifactorial aetiology (hypertensive, radiotherapy, myocarditis and obesity) decompensated by Chikungunya.

**Diagnostic Pathways:** Echocardiogram (ECHO) in 2018 with left ventricle (LV) enlargement associated with mild systolic dysfunction, in addition to septal akinesia and inferior hypokinesia. Serology for Chikungunya was positive in both samples collected. ECHO in 2022 with normal LV, in addition to normal biventricular function and no segmental changes.

**Discussion and Learning Points:** HF is a complex clinical syndrome, and its aetiology can be multifactorial. When considering global statistics, ischemic causes have a higher prevalence, however, in Brazil, hypertension and diabetes mellitus gain significant epidemiological importance due to social, economic, and cultural determinants. Furthermore, radiotherapy is responsible for 10 to 20% of LV systolic and diastolic dysfunction within 5 to 10 years after treatment. Obesity is a poor prognostic factor, considering that 49% of individuals with HF have a BMI above 25 kg/m. Viral infections such as Chikungunya should be considered as an aetiology and causative factor for patient decompensation.

**Keywords:** heart failure, Chikungunya, decompensation

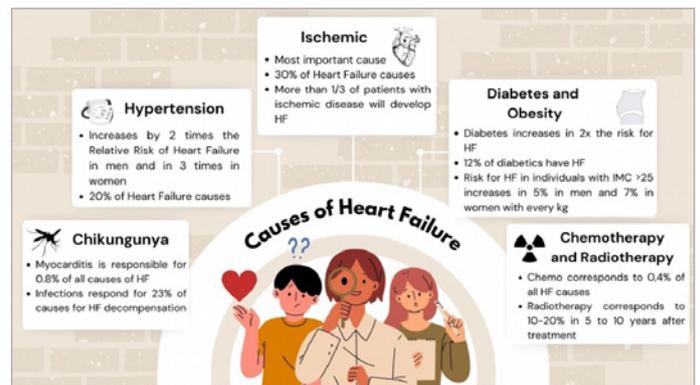


Figure 1. Causes of heart failure

[Abstract:1338]

## ACUTE DECOMPENSATED HEART FAILURE: SEQUENTIAL NEPHRON BLOCKADE VERSUS ONLY LOOP DIURETICS

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**Summary:** Diuretic resistance is a major complication during hospitalization for acute heart failure (AHF), causing congestion persistence at discharge, impacting mortality and readmission rates.

**Purpose:** To compare the efficacy and safety of the use of sequential nephron blockade (SNB) versus the only loop diuretics in AHF patients.

**Methods:** Retrospective clinical and biochemical data about AHF-patients admitted in an Italian single centre of internal medicine from April to July 2023 were collected. Patients were divided in Group A (treated with SNB: loop diuretics, acetazolamide, mineralocorticoid receptor antagonist and sometimes also thiazide/metolazone) and Group B (treated with only loop diuretics) treated for at least 3 days.

**Findings:** Ten patients of Group A with a median age of 84.5 years and 10 patients of Group B with a median age of 85 years were selected.

No differences were found about the clinical and biochemical data between the Group A and Group B. To note that the use of SNB seemed to be slightly safer since that Group A was associated with a less frequent electrolyte abnormalities ( $p=0.09$ ) or worsening of renal function ( $p=0.2$ ) respect the Group B, even if this difference was not statistically significant.

Moreover, we observed a shorter but not statistically significant difference length of stay in patients of Group A than patients of Group B ( $p=0.05$ ).

**Conclusions:** SNB seemed to be an effective and safe strategy to

overcome most diuretic resistance mechanisms and reach efficient decongestion. Larger randomized controlled trial is needed.

**Keywords:** heart failure

[Abstract:1347]

## EFFECT OF SODIUM-GLUCOSE COTRANSPORTER TYPE 2 (ISGLT2) INHIBITORS ON THE DEVELOPMENT OF TACHYARRHYTHMIAS IN PATIENTS WITH HEART FAILURE WITH REDUCED LVEF

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**Introduction:** The iSGLT2s have been shown to be effective in the treatment of heart failure. However, their effect on the development of tachyarrhythmias in these patients is not yet fully understood. The aim of this analysis was to find out the protective effect of iSGLT 2 on the development of tachyarrhythmias in heart failure (HF) patients with reduced ejection fraction (LVEFr).

**Methods:** Patients referred to our HF clinic with LVEFr and device carriers between 2014 and 2022 were prospectively included. The incidence of arrhythmic events was analysed using multivariate models.

**Results:** We included 85 patients ( $70 \pm 9$ ), 36 (42%) were treated with iSGLT 2. The main device implanted was ICD (45.9%) in primary prevention (58, 8%). Significant differences were found in the occurrence of arrhythmic events after 2 years of follow-up ( $p=0.039$ ) with an OR 3.12 (1.06-9.20) independently of the other variables.

**Conclusions:** In this cohort of patients with HF and LVEFr, iSGLT 2 proved to be protective in the development of tachyarrhythmias independently of the other drugs used in the treatment of HF with LVEFr, its aetiology and other comorbidities.

**Keywords:** iSGLT2, LVEFr, tachyarrhythmias

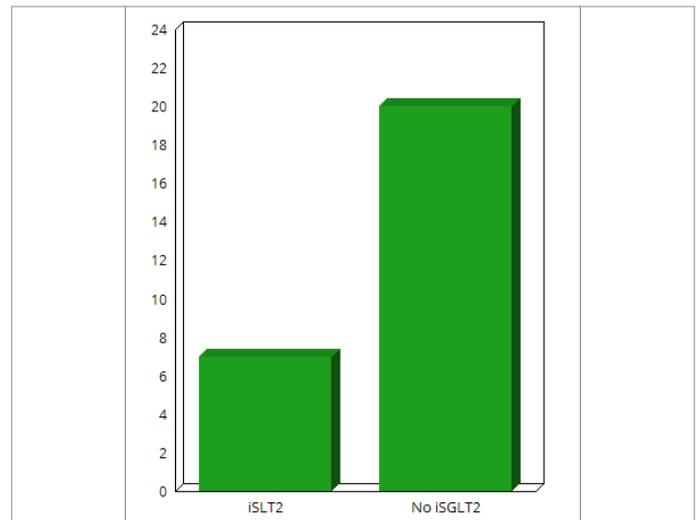


Figure 1. Development of tachyarrhythmias.

[Abstract:1350]

## DIFFICULTIES OF DIFFERENTIAL DIAGNOSIS OF AORTIC DISSECTION

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The clinic of aortic dissection (AD) is diverse. Along with the classic signs, there are many “masks” that create difficulties in differential diagnosis with syndrome similar diseases. The difficulties in the diagnosis of AD include: rare pathology, atypism of the AD clinic. In the described cases, there were symptoms that should have been alerted in terms of AD. So, in the first clinical case- this is an acute onset with a sharp rise in blood pressure, unusual irradiation of anginal pain in the lumbar region, asymmetry of the pulse and blood pressure on the extremities, the development of gangrene of the right lower limb. In the second described case, the symptomatology of a degenerative-dystrophic lesion of the spine prevailed. Symptoms that are alarming in AD: - on magnetic resonance imaging of the spine, the expansion of the abdominal aorta, which could lead to the assumption of involvement in the pathological process of the thoracic aorta, the presence of anaemia. The third case – according to symptomatology, is close to the classic variant of AD: severe anginous status, pulse asymmetry and blood pressure. Symptoms such as nausea, vomiting, diarrhea, and most importantly, the short duration of observation, did not allow for a correct diagnosis at admission. In all clinical observations, the analysis of complaints, anamnesis, physical and instrumental data ultimately allowed the diagnosis of AD to be made.

For the timely diagnosis of AD, it is important to use available methods of instrumental diagnostics, from routine to high-tech.

**Keywords:** aortic dissection, clinical diversity, diagnostic complexity

[Abstract:1355]

## IRON SKIN STAINING: AN UNCOMMON AND POTENTIALLY PERMANENT COMPLICATION FOLLOWING IV IRON INFUSION FOR HEART FAILURE MANAGEMENT

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**Case Description:** A 68-year-old female patient presented to the emergency department due to a progressively worsening dyspnoea and asthenia. Her past medical history was significant for heart failure secondary to drug cardiotoxicity (following breast cancer radio- and chemotherapy). A recent transthoracic echocardiogram revealed a reduced ejection fraction of 23%, and she had recently undergone aortic valve replacement with a mechanical valve.

On physical examination she presented mental confusion, peripheral oedema, jugular venous distension, and oliguria. Bloodwork disclosed elevated levels of serum creatinine (1.79 mg/dL) and NT-proBNP (16,568 pg/mL), along with decreased haemoglobin (10.8 g/dL), serum ferritin (41 µg/dL), and transferrin saturation (18%).

**Clinical Hypothesis:** The presentation aligned with acute decompensated heart failure (ADHF), leading to hospital admission and the initiation of IV diuretic therapy, along with levosimendan perfusion. In order to improve symptomatic control, on the second day she received an IV iron infusion with ferric carboxymaltose, resulting in subsequent burning, swelling, and redness at the injection site and surrounding tissues, consistent with Iron Skin Staining (ISS).

**Discussion and Conclusions:** ISS, an uncommon yet potentially permanent adverse effect of parenteral iron preparations, occurs following cutaneous and subcutaneous tissue extravasation. Adhering to clear administration and monitoring procedures, ensuring staff training, and patient education can reduce the risk of ISS. This case discusses strategies to mitigate this adverse effect and presents the expected long-term clinical evolution of ISS. While not posing serious medical complications, the potential enduring aesthetic effects often lead to psychological implications for the patient.

**Keywords:** acute decompensated heart failure (ADHF), iron deficiency, iron skin staining (ISS)

[Abstract:1367]

## CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) AND VENOUS THROMBOEMBOLISM (VTE): IDENTIFYING PATIENTS WARRANTING FURTHER INVESTIGATION

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This study aims to delineate the characteristics of Chronic Obstructive Pulmonary Disease (COPD) patients within an Internal Medicine department and to discern distinctive factors associated with the development of venous thromboembolism (VTE).

**Methods:** A retrospective analysis was conducted on a cohort of COPD patients admitted to our department over a 3-month period. Data collection encompassed baseline characteristics, as well as global initiative for chronic obstructive lung disease (GOLD) stage and class. Within the total population, those experiencing a VTE event were identified and categorized based on the manifestation of pulmonary thromboembolism (PTE), deep vein thrombosis (DVT), or a combination of both.

**Results:** Among the 130 recruited COPD patients, 108 did not develop VTE, while 15 did (7 miscategorized). PTE without DVT predominated among VTE cases. Patients with PTE exhibited a higher GOLD stage, and those with VTE demonstrated a worse GOLD class. Calculating the odds ratio for GOLD class revealed a 4.3-fold increased risk of VTE for class E, although the calculation for GOLD stage did not attain statistical significance.

**Conclusions:** A higher prevalence of PTE without DVT was observed among COPD patients. Notably, patients with GOLD class E or stage >2 exhibited an elevated risk of VTE. This supports the hypothesis that local pulmonary inflammation and impaired vascularization contribute to thrombotic phenomena, favouring a local rather than embolic origin. We advocate considering GOLD classification in the development of future predictive scores for prophylactic anticoagulation in COPD patients.

**Keywords:** chronic obstructive pulmonary disease, venous thromboembolism, anticoagulation

	Without VTE	With VTE	PTE	DVT	PTE + DVT	P-value
<b>Total</b>	108 (87,8%)	15 (12,2%)	11 (8,9%)	7 (5,7%)	3 (2,4%)	-
<b>Age</b>	77,7	78,4	79,6	73,9	72	-
<b>Obesity</b>	37 (34,3%)	8 (53,3%)	7 (63,6%)	3 (42,9%)	2 (66,7%)	0,051
<b>Sex (male)</b>	91 (84%)	13 (86,7%)	9 (81,8%)	6 (85,7%)	2 (66,7%)	-
<b>Smoking</b>	21 (19,4%)	5 (33,3%)	4 (36,4%)	2 (28,6%)	1 (33,3%)	-
<b>Former smoking</b>	82 (75,9%)	9 (60%)	6 (54,5%)	5 (71,4%)	2 (66,7%)	-
<b>ICAT</b>	67,65	72	60	76,7	55	-
<b>Malignancy</b>	19 (17,6%)	0	0	0	0	-
<b>Immobilisation</b>	25 (23,1%)	3 (20%)	3 (27,3%)	0	0	-
<b>Oxygen therapy</b>	34 (31,5%)	6 (40%)	5 (45,5%)	3 (42,9%)	2 (66,7%)	-
<b>Anti-aggregation</b>	29 (26,9%)	4 (26,7%)	2 (18,2%)	2 (28,7%)	0	-
<b>Diuretics</b>	80 (74,1%)	13 (86,7%)	9 (81,8%)	7 (100%)	3 (100%)	-
<b>Charlson (&gt;2)</b>	88 (71,5%)	14 (93,3%)	10 (90%)	6 (85%)	2 (66,7%)	-
<b>GOLD (&gt;2)</b>	18 (16,7%)	5 (33%)	5 (45,5%)	2 (28,6%)	2 (66,7%)	0,047
<b>Class</b>	A: 4 (3,7%) B: 18 (16,7%) E: 19 (17,6%)	A: 1 (46,7%) B: 0 E: 7 (26,7%)	A: 1 (9,1%) B: 0 E: 5 (45,5%)	A: 1 (14,3%) B: 0 E: 3 (42,9%)	A: 1 (33,3%) B: 0 E: 1 (33%)	0,036
<b>SABA</b>	26 (24,1%)	4 (26,7%)	3 (27,3%)	3 (42,9%)	2 (66,7%)	-
<b>SAMA</b>	27 (25%)	5 (33,3%)	3 (27,3%)	3 (42,9%)	1 (33,3%)	-
<b>LABA</b>	71 (65,7%)	12 (80%)	8 (72,7%)	5 (71,4%)	1 (33,3%)	-
<b>LAMA</b>	57 (52,8%)	10 (66,7%)	8 (72,7%)	3 (42,9%)	1 (33,3%)	-
<b>Inhaled corticosteroids</b>	48 (44,4%)	11 (73,3%)	7 (63,6%)	6 (85,7%)	2 (66,7%)	-
<b>Triple therapy</b>	17 (15,7%)	3 (20%)	2 (18,2%)	2 (28,6%)	1 (33,3%)	-

**Table 1.** Baseline characteristics and comparative study between COPD patients with and without VTE during their evolution.

The table shows the baseline characteristics of the patients and the comparative study between COPD patients with and without VTE during the period. The acronyms mean: - VTE: venous thromboembolism. - PTE: pulmonary thromboembolism. - DVT: deep vein thrombosis. - ICAT: cumulative smoking rate. - GOLD: Global Initiative for Chronic Obstructive Lung Disease. Stage and Class. - SABA: Short-Acting Beta-Agonist inhaled treatment. - SAMA: Short-Acting Muscarinic Antagonist inhaled treatment. - LABA: Long-Acting Beta-Agonist inhaled treatment. - LAMA: Long-Acting Muscarinic Antagonist inhaled treatment. - Triple therapy: LAMA + LABA + corticosteroids inhaled treatment.

[Abstract:1387]

## A UNIQUE CASE OF A PATIENT WITH AN EMBOLIC INFERIOR STEMI AND RIGHT VERTEBRAL ARTERY OCCLUSION AND THE MANAGEMENT DILEMMAS THAT FOLLOWED

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A 58-year-old male patient came in with hyperacute central cardiac chest pain on waking up followed by acute vertigo that was persistent along with dysarthria and severe right sided ataxia. He was suspected as having an acute stroke in a district general hospital and had a stroke-CT-angiogram sequence which showed a right vertebral artery occlusion. He had an ECG showing

evidence of ST elevation in the inferior leads with reciprocal changes consistent with ACS. His chest pain lasted under 5 minutes from onset, but his neurological symptoms were quite pronounced. He was transferred to the Tertiary centre where interventional neuroradiology services were available. Given the dual pathology of an acute right vertebral artery occlusion and Inferior STEMI this prompted an urgent discussion with the cardiologists, neurologists, and interventional radiology team. As the patient's chest pain had settled a decision was made to take the patient for endovascular thrombectomy of the right vertebral artery first followed by a coronary angiogram later. The endovascular retrieval of the right V1 clot was successful and later upon doing the invasive coronary angiogram it was noticed that he had a proximal RCA clot with normal coronaries. He had a delayed clot retrieval and stenting done. He had investigations for a central thrombus (TTE, Bubble echo) and investigations for a hypercoagulable state which was all normal. Our patient did very well after from both a neurological and cardiology perspective. Simultaneous cardio-cerebral infarction is a challenging situation and there are no formal international guidelines.

**Keywords:** cardio-cerebral infarction, acute stroke, endovascular thrombectomy

[Abstract:1388]

## INDOOR AIR POLLUTION IMPACTS SLEEP: INSIGHTS INTO CARDIOVASCULAR AUTONOMIC CONTROL AND INFLAMMATION

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The aim of our study was to investigate the effects of indoor air pollution exposure on sleep quality, cardiovascular autonomic control (CAC) and inflammation in healthy subjects.

We enrolled 20 volunteers in a metropolitan area (Milan, Italy). A 7-day monitoring was performed through a wireless monitor patch that continuously recorded ECG, respiratory activity and actigraphy. The indoor levels of fine particulate matter (PM 2.5), nitrogen dioxide (NO<sub>2</sub>) and volatile organic compounds (VOCs) were monitored at the same time using a next-generation detector. The cyclic variation of heart rate index (CVHRI n° events/

hour), which is a proxy for sleep apnoea risk evaluation, and the LF/HF index, a marker of autonomic alteration characterized by sympathetic predominance, were derived. At the end of the 7-day monitoring, blood samples were collected to assess inflammatory profile. Multiple linear regression and correlation analysis were performed to assess the relationship between sleep, indoor air pollution and inflammation.

We found a positive association between the mean exposure to VOCs in 24 hours with CVHRI and the CVHRI was associated with higher values of LF/HF during sleep. Furthermore, we highlighted a positive association between the mean exposure to NO<sub>2</sub> in 24 hours and the pro-inflammatory biomarker triggering receptor expressed on myeloid cells 1, as well as the anti-inflammatory biomarker IL-10.

Our results showed a possible causal relationship between the exposure to indoor air pollutants and an initial alteration of CAC and inflammation during sleep in healthy subjects. Studies in cohorts of cardiovascular patients are required to better understand these mechanisms.

**Keywords:** indoor air pollution, cardiovascular autonomic control, inflammation, sleep

[Abstract:1410]

## TRANSCUTANEOUS VAGAL NERVE STIMULATION AS A POSSIBLE THERAPEUTICAL OPTION FOR DYSAUTONOMIA ASSOCIATED WITH POSTURAL TACHYCARDIA SYNDROME (POTS): A CASE REPORT

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A 24-year-old female affected by Ehler-Danlos syndrome and small fibre neuropathy presented to our outpatient clinic for postural tachycardia syndrome (PoTS). She previously had recurrent syncope, so she performed a head up TILT-test, which was conclusive for PoTS. In March 2023, we repeated a head up tilt test that confirmed the diagnosis of PoTS (delta HR 45 bpm) without orthostatic hypotension). We performed specific questionnaires to evaluate the presence and the severity of dysautonomic symptoms: the Pittsburgh Sleep Quality Index, which showed a serious sleep disorder and the orthostatic hypotension questionnaire, that revealed symptoms of orthostatic intolerance. Considering the PoTS associated with dysautonomia possibly linked to an autonomic dysfunction, we started a preliminary 3 weeks treatment with transcutaneous auricular vagus nerve stimulation (tVNS).

We re-evaluated the patient after 27 days of tVNS. During the head up tilt test she no longer showed tachycardia during passive standing or symptoms attributable to orthostatic intolerance. The

questionnaires showed an improvement in the quality of sleep and a reduction of symptoms related to orthostatic intolerance.

This preliminary report suggests that tVNS could be a possible therapeutic option for dysautonomic symptoms present in POTS associated with Ehlers-Danlos. These results could be due to the neuromodulatory effect of tVNS, which is able to modify the central autonomic networks responsible for cardiovascular regulation.

Future studies are required to confirm, in the long-term perspective, the efficacy of tVNS as a possible therapeutic approach for POTS.

**Keywords:** autonomic dysfunction, postural tachycardia syndrome, transcutaneous auricular vagus nerve stimulation

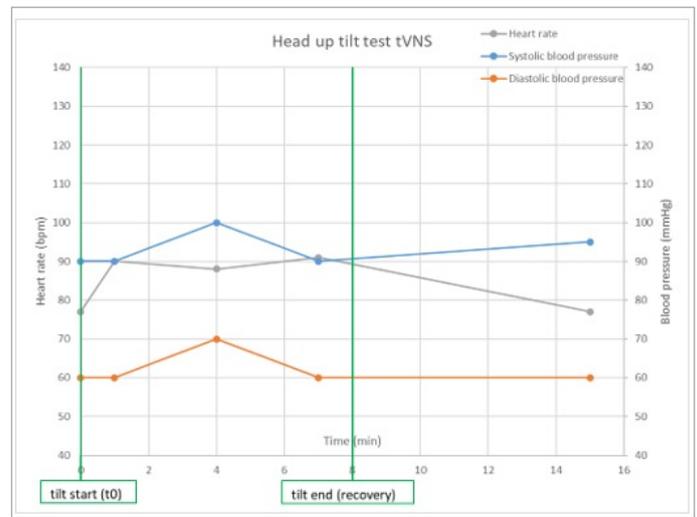


Figure 1. Head up tilt test after tVNS.

After 27 days of tVNS, the patient did not show either tachycardia during passive standing or symptoms attributable to orthostatic intolerance during the head up tilt test; the cardiovascular response to autonomic manoeuvres was normal.

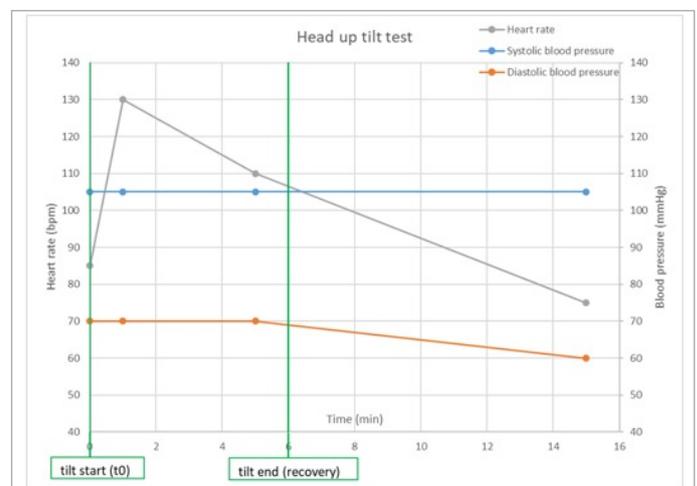


Figure 2. Head up tilt test before tVNS.

At the head up tilt test in the transition from supine position to upright position there was an increase in heart rate (HR) >30 points without orthostatic hypotension. So the exam confirmed the diagnosis of PoTS.

[Abstract:1415]

## TREATMENT OF HYPERTROPHY CARDIOMYOPATHY AND LEFT VENTRICULAR OUTFLOW TRACT OBSTRUCTION: UPS AND DOWNS

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Our clinical case describes a combination of two expected, but opposite effects from the use of beta-blockers (BB) in patients with hypertrophic cardiomyopathy (HCM) and left ventricular outflow tract obstruction (LVOT).

An 83-year-old woman was admitted to the emergency department after an episode of loss of consciousness with a severe weakness. At the time of admission, attention was drawn to the presence of bradycardia (37 bpm) and paroxysm of atrial fibrillation. Due to the absence of angina and increased cardiac-specific enzymes, the presence of chronic kidney disease C4, it was decided that there was no need for emergency percutaneous intervention. We made a decision about the medicinal nature of sick sinus syndrome and reduced the dosage of BB, discontinued antiarrhythmic. According to Holter monitoring - heart rate was normalized. From the anamnesis: echocardiography in 2019 revealed that she had SAM syndrome and a small left ventricular cavity, however, due to her age and high risk, the patient was not shown surgical treatment. She took BB, antiarrhythmic, statins, new oral anticoagulants, diuretics. There has been an improvement in the functional parameters of the heart since 2022: end-diastolic volume increased from 48 to 60 ml, end-systolic volume - from 8 to 16 ml, the gradient of LVOT decreased from 81 to 42 mmHg. Our clinical case depicts the importance of prescribing pathogenetic therapy in patients with HCM and LVOT and subsequent monitoring of its optimal doses in a particular patient.

**Keywords:** hypertrophic cardiomyopathy, beta blocker, left ventricular outflow tract obstruction

[Abstract:1424]

## BENEFITS WITH THE USE OF DABIGATRAN IN NONAGENARIAN PATIENTS WITH ATRIAL FIBRILLATION

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**Background and Aims:** Nonagenarian patients are underrepresented in trials that have evaluated oral anticoagulation in patients with atrial fibrillation (AF). The aim of this study was to assess the effectiveness and safety of dabigatran 110 mg twice daily (D110) in patients with AF age  $\geq$  90 years old, treated in an Internal Medicine Department.

**Methods:** Observational and prospective study, without

comparator group. Descriptive analysis included risk factors, comorbidities and underlying pathologies at the time of inclusion. Simple means with standard deviations (SD) and crude incidence rates of events/100 patients/year, calculated in those with a follow-up > 60 days, are shown.

**Results:** 53 patients (56.6% women) were followed for 1.75 years (1.52); 34.1% of them without prior anticoagulant treatment. The mean CHA<sub>2</sub>-DS<sub>2</sub>-VASc was 5.57 (1.47) and the HASBLED was 2.83 (1.09). The average number of comorbidities was 5.0 (1.5), the 62.3% had an eGFR >60ml/min/m<sup>2</sup> and 54.7% had cognitive impairment. The incidence rates have been calculated on 49 patients. There were a total of 6 ischemic or major bleeding outcomes (incidence rate of 6.39%/year), non fatal: one ischemic stroke (1.07%/year), one haemorrhagic stroke (1.07%/year), three major extra cranial bleedings (3.2%/year) and one acute coronary syndrome (1.07%/year). Idarucizumab was used in two major haemorrhagic events, with successful haemostasis. Nine patients died from cardiovascular causes and another 9 from noncardiovascular causes (9.6%/year, respectively).

**Conclusions:** One in three elderly nonagenarians with AF does not receive antithrombotic treatment. In our experience, D110 is shown to be a safe and effective anticoagulant in nonagenarians with AF.

**Keywords:** dabigatran, atrial fibrillation, nonagenarian

[Abstract:1426]

## RARE DOUBLE HETEROZYGOUS MUTATION IN A PATIENT WITH SEVERE FAMILIAL HYPERCHOLESTEROLEMIA

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Familial hypercholesterolemia (FH) is an autosomal dominant inherited disease. According to the RENESSANCE registry, incidence of FH in Russia is higher than previously thought. Molecular genetic analysis is not a routine practice, but it allows in most cases to verify the diagnosis and optimize treatment tactics. New molecular technologies (full-exome sequencing) result in discovery of new unknown mutations; this may be particularly relevant in poorly studied multinational populations. We present a clinical case of FH in a 29-year-old woman with total cholesterol 514.2 mg/dl, low density lipoprotein cholesterol 444.6 mg/dl, multivessel coronary atherosclerosis and history of an acute myocardial infarction, diagnosed one month after successful delivery at the stage of post-infarction cardiosclerosis, and a second myocardial infarction 10 months later. A combination of three lipid-lowering agents was applied to achieve the target value of low-density lipoprotein cholesterol. The molecular genetic and bioinformatic analyses were performed in Health in

Code Laboratory (Spain). A double heterozygous mutation for the known pathogenic variant in the low-density lipoprotein receptor (LDLR) gene (NP\_000518.1:p.Leu401His) and rare variant in apolipoprotein B-100 (APOB) gene (NP\_000375.2:p.Gln4494del), likely to be disease-causing, was identified. This rare combination resulted in the phenotype more typical for homozygous FH. The presence of the identified genetic variant of the APOB gene can aggravate the phenotype in carriers of other mutations associated with FH, such as a high penetrance mutation of the LDLR gene in the index patient. It has been suggested that both genetic variants should be included in the family genetic screening program.

**Keywords:** *familial hypercholesterolemia, double heterozygous mutation, APOB gene, LDLR gene*

[Abstract:1429]

## INFLUENCE OF THE MEDITERRANEAN DIET ON THE VARIATION OF CAROTID INTIMA-MEDIA THICKNESS ACCORDING TO THE LIVER FIBROSIS DEGREE. CORDIOPREV STUDY

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**Summary:** Metabolic dysfunction-associated steatotic liver disease is associated with cardiovascular risk due to the vascular damage that it causes. Carotid intima-media thickness (CIMT) is a tool that allows stratification of cardiovascular risk and enables measures such as the consumption of a Mediterranean diet to be implemented early to reduce mortality.

**Purpose:** To evaluate the relationship between the liver fibrosis degree and CIMT and the influence of diet on it.

**Methods:** In 1002 participants in the CORDIOPREV study, six liver fibrosis indexes were calculated: APRI, FIB-4, BARD, Forns, NFS and Hepamet, classifying them into groups. Differences in CIMT between groups and their evolution over time were analysed, considering fibrosis groups and diet received as intersubject factors. Covariates were also introduced.

**Findings:** A higher degree of liver fibrosis was associated with greater CIMT, with the inverse relationship being maintained. The Mediterranean diet reduced it regardless of the fibrosis degree; however, advanced fibrosis was capable of interfering with its benefits. Diabetes mellitus, LDL and HDL cholesterol fractions

and diastolic blood pressure were significant covariates.

**Conclusions:** Patients with a higher liver fibrosis degree developed greater CIMT, and the Mediterranean diet reduced it in both higher and lower fibrosis groups. However, established fibrosis appeared to diminish the benefits of the diet in reducing vascular damage. Intervening factors were diabetes mellitus, LDL and HDL cholesterol fractions and diastolic blood pressure.

**Keywords:** *steatotic liver disease, carotid intima-media thickness, Mediterranean diet*

[Abstract:1441]

## PROFILE OF PATIENTS WITH ATRIAL FIBRILLATION TREATED WITH DABIGATRAN IN REAL CLINICAL PRACTICE

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**Background and Aims:** To describe the clinical characteristics of patients with atrial fibrillation (AF) who receive dabigatran in real clinical practice

**Methods:** Observational and prospective study of the main risk factors and comorbidities of patients with AF treated in a department of Internal Medicine, in whom treatment with Dabigatran is started until January 2022. The patients were dosed according to criteria data sheet of the Spanish National Health System.

**Results:** 471 patients (47% female), mean age 81.8 (7.7) years; 84.1% received dabigatran 110 mg twice daily (D110); 75.2% had permanent AF, of which 28.2% had not received prior anticoagulant treatment. There were no patients overdosed and 2.5% were off-label underdosed with D110. The clinical profile at baseline of the patients is shown in the table.

**Conclusions:** Dabigatran has two doses aimed at different populations. D110 patients are older, have a higher burden of comorbidities, are polymedicated and have a higher ischemic and haemorrhagic risk. One in four patients with permanent AF had not received anticoagulant treatment.

**Keywords:** *atrial fibrillation, dabigatran, real clinical practice*

	Total	Dabigatran 110	Dabigatran 150
Age, mean (SD)	81.8 (7.7)	84.1 (5.0)	69.1 (6.7)
CHA2DS2-Vasc, mean (SD)	4.8 (1.49)	5.1 (1.37)	3.4 (1.29)
HASBLED, mean (SD)	2.4 (0.89)	2.5 (0.88)	1.91 (0.77)
Comorbidities, mean (SD)	4.0 (1.7)	4.2 (1.67)	2.82 (1.3)
Hypertension %	90.2	92.7	77.3
Diabetes %	32.1	32.2	30.7
eGF < 60 ml/min/m <sup>2</sup> , %	41.8	48	9.3
Ictus ischemic %	31.4	33.6	20.0
Major bleeding %	16.9	28.2	9.3
Ischemic heart disease %	11.3	11.4	10.7
Heart Failure %	50.7	53.3	37.3
Dementia %	28.6	32.1	4.0
Medications, mean (SD)	7.1 (2.9)	7.31 (2.9)	6.0 (2.74)

Table 1. The clinical profile at baseline.

[Abstract:1446]

## TWO STEP STRATEGY IN REAL LIFE. SUITABLE FOR A VERY HIGH CARDIOVASCULAR RISK POPULATION?

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**Objectives:** Evaluate the degree of control of LDL (c-LDL) cholesterol following the two-step intensification strategy of hypolipidemic treatment according to the percentage of c-LDL reduction proposed in the latest guidelines in Peripheral Arterial Disease (PAD).

**Methods:** Retrospective observational study from a 47-patient cohort diagnosed with PAD and followed for 18 months. We gathered information about cardiovascular risk factors, PAD stratified according to Fontaine classification, cardiovascular events, need for revascularization and mortality. The degree of achievement of c-LDL objectives in successive visits was evaluated, depending on the hypolipemiant drugs prescribed.

**Results:** 76.6% of the patients were men and the mean age was 66.6±9.2 years. 64.1% of patients were smokers, 67.3% had HT, 48.1% had diabetes and 29.6% were obese. The presence of CVD prior to inclusion was: ischemic heart disease (33.3%), stroke (5.8%) and PAD (59%). BMI of 28.3±4.2; SBP averaged 147±18 mmHg and DBP averaged 84±12 mmHg.

The mean value of c-LDL was 87±35 mg/dl. 17.3% of patients had no statin prescriptions, 42.3% had medium-power statins and 40.4% had high-power statins. 23% of patients were also prescribed ezetimibe.

**Conclusions:** The patients with PAD analysed in this study had c-LDL levels above recommended objectives by the CPGs. Less than half of the patients were treated with high-power statins and less than a quarter were on combined therapy. We conclude the need to introduce an intensive lipid-lowering treatment earlier in

this population. The possibility of more or less spaced follow-up is a factor to consider when choosing a therapeutic strategy.

**Keywords:** peripheral arterial disease, two-step, statin

[Abstract:1457]

## ASSESSMENT OF RE-ENTRY IN PATIENTS WITH HEART FAILURE IN AN INTERNAL MEDICINE SERVICE OF A SECOND LEVEL HOSPITAL

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Medicina Interna, Complejo Asistencial de Zamora, Zamora, Spain

**Purpose:** Treatment guidelines for patients hospitalized for heart failure recommend early review in outpatient clinics to improve patient follow-up. Our goal is to evaluate readmissions to an internal medicine service due to heart failure and their follow-up after discharge.

**Methods:** Descriptive observational study. We select patients admitted to our internal medicine service on an undetermined day. We considered the total number of admissions, the number of patients readmitted for heart failure and the posterior follow up.

**Findings:** On the cut-off day there were 71 patients admitted to the internal medicine service. Of them, 19 patients were admitted for heart failure, which represents a total of 26%. We found 6 patients who were also readmitted for heart failure (31% of the total patients admitted for heart failure). Regarding follow-up, only 1 patient of the 6 who were readmitted was scheduled for an outpatient review after the first admission (16% of the total). Although this is a first approach to the assessment of patients admitted to our service for heart failure given the small size of the study, we have found a high rate of readmissions for this reason and a very low percentage of revisions after the first admission.

**Conclusions:** 1. Heart failure was one of the main causes of admission.

2. We found a high rate of readmission patients for this reason.

3. The follow-up rate in outpatient clinics was very low.

4. An extension of the study is necessary in order to reach conclusions that enable decision-making.

**Keywords:** heart failure, readmission, follow-up

[Abstract:1458]

## BIG DATA OF DEATHS IN HOSPITALIZED HEART FAILURE PATIENTS. WHAT CAN WE LEARN?

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**Introduction:** Health administrative information allows obtaining relevant information for decision-making in the field of hospital management. These data are increasingly accessible and can be used for decision-making in the management of hospitalization for heart failure.

**Materials and Methods:** Data from the minimum basic data set from a second level hospital in Spain were used to obtain information on hospital care for patients admitted for heart failure under the care of Internal Medicine between the years 2016 and 2022. The mean and standard deviation were used to describe quantitative variables and percentages for the qualitative variables. Graphs were created using the tools available in SPSS Version 25.

**Results:** Throughout the study period, 1,442 patients were treated for heart failure, with a range between 157 and 250 patients per year. The most frequent age groups were those between 80 and 89 years, 90 and 99 years and 70 to 79 years, in descending order. Hospital deaths increased with age and changed from 12% in 2016 to 11.2% in 2022 among patients aged 80 to 89 years. The hospital admission rate tended to decrease in all series and went from 5.25 to 4.63 admissions per 100,000 inhabitants. The average length of stay also tended to decrease, more markedly in older age groups. And finally, the number of patients with admissions of 2 or fewer days decreased during 2020 and 2021 but shows a tendency to increase again.

**Discussion:** Administrative data offer relevant information for the management of hospitalization in heart failure.

**Keywords:** Spain, big data, heart failure, management

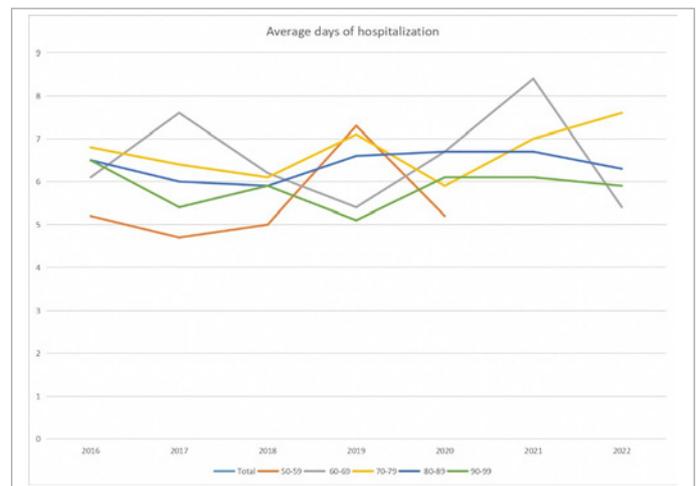


Figure 1. Average of the number of days hospitalized per year in Internal Medicine

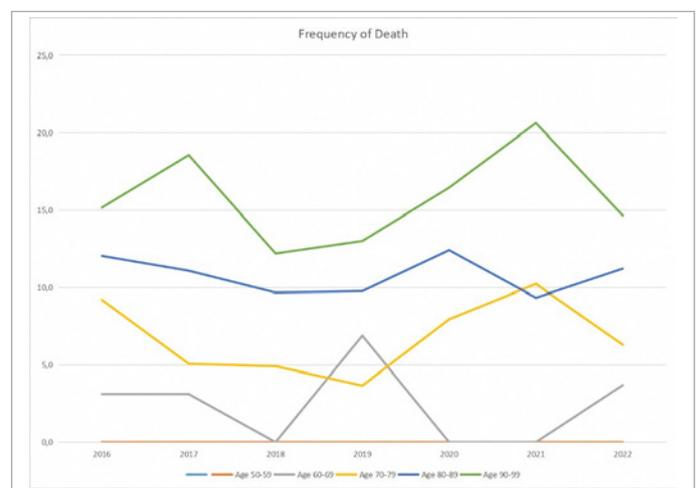


Figure 2. Number of deaths per 100 hospitalizations due to heart failure in Internal Medicine

[Abstract:1488]

## HYPERLIPOPROTEIN (A) AND CARDIOVASCULAR RISK. ONE MORE INDIVIDUAL FACTOR?

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**Introduction:** Lipoprotein(a) (Lpa), similar to LDL, holds atherogenic traits. Despite its correlation with higher cardiovascular disease risk in the general and familial hypercholesterolemia populations, evidence supporting reduced Lpa preventing heart disease is scarce.

**Objective:** The study aims to outline cardiovascular risk factors (CVRF) linked to heightened Lpa and its association with cardiovascular events among patients at a Spanish tertiary care hospital.

**Methods and Results:** This retrospective study analysed 195

patients with Lpa levels >80 mg/dl during 2019-2021, showcasing diverse age groups (4.6% <30 yrs, 29.2% 31-50 yrs, 47.7% 51-70 yrs, 18.5% >71 yrs) and the presence of associated CVRF, lipid profiles, treatments, and prior ischemic events.

Carotid atheromatosis was found in 12.8% undergoing supra-aortic ultrasound (29.7%), aortic valve arteriosclerosis in echocardiographic studies (14.4% in 47.7%). At follow-up start, 29.7% had prior ischemic events (20.5% heart disease, 3.6% stroke, 2.1% arterial ischemia). 3.1% experienced multiple events; 9.7% had events during follow-up, mostly heart disease (5.1%). Studying Hyperlipoproteinemia(a) and cardiovascular events, we divided patients into CVRF and non-CVRF groups. 8.5% without other CVRFs had major events, contrasting with 45% with CVRFs experiencing ischemic events, suggesting a link between Hyperlipoproteinemia(a) and such events.

**Conclusions:** In our study, patients with Lpa >80 mg/dL developed ischemic events only when accompanied by other CVRFs ( $P < 0.05$ ). Lp(a) correlates with established CVRFs, but its independent role in causing ischemic events requires more data. Aggressive control of other CVRFs alongside elevated Lp(a) is vital in primary prevention until long-term survival studies determine its isolated treatment's efficacy.

**Keywords:** lipoprotein(a), cardiovascular disease, hypercholesterolemia

[Abstract:1517]

## CLINICAL AND INSTRUMENTAL CHARACTERISTICS OF ENDOTHELIAL FUNCTION IN PATIENTS WITH PERIPHERAL ATHEROSCLEROSIS

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The study included 559 patients (the first group included 519 patients with atherosclerosis of various localizations, the second group - a control group - 40 patients without lipid metabolism disorders, without hereditary burden, without clinical manifestations of atherosclerosis and severe chronic diseases. Patients had their complaints collected, and their medical history and objective status were analysed. Standard laboratory tests were carried out to evaluate lipid profile indicators, complex of instrumental studies and examination of the cardiovascular system using the Angioscan apparatus. The analysis carried out using the Angioscan hardware-diagnostic complex, aimed at assessing the parameters of endothelial function, demonstrated a statistically significant difference when comparing the following indicators: Alp-index of increase, which in patients with atherosclerotic lesions of various vascular systems was  $27.4 \pm 18.2\%$ , and in the control group  $-8.9 \pm 6.4\%$  ( $p < 0.001$ ). For persons aged 60 years, the interval of the parameter under discussion is in the range of 7.53-

47.67%. Analysis of the obtained factual material demonstrated a statistically significant difference in assessing the calculated augmentation index, so in patients of the first group it was 25.0 [18.2; 27.4]%, in the control group  $-11.5 [5.2; 13.3]\%$  ( $p < 0.001$ ). When analysing the age of the vascular system, it was noted that the assessed criterion was significantly higher in patients of the first group, compared with patients from the control group ( $76.7 \pm 11.8$  and  $58.2 \pm 6.4$  years, respectively,  $p < 0.001$ ). The use of non-invasive diagnostic methods opens up great prospects for verifying the pathological process and undoubtedly allows for a detailed assessment of the presence or absence of endothelial dysfunction in patients at very high risk.

**Keywords:** atherosclerosis, endothelial dysfunction, non-invasive diagnostics

[Abstract:1528]

## THEY ARE NOT ALWAYS POSITIVE

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**Purpose:** We present the case of a 49-year-old woman with Behçet's disease with immunosuppressive treatment who initially presented with digestive symptoms, with unexpected results on echocardiogram.

**Methods:** She required admission due to diarrheal syndrome and moderate dyspnoea. Preliminary studies did not show data of systemic infection. Serology and cultures were negative. Digestive samples were taken and empirical antibiotic therapy was started. ETT and ETE was performed, revealing severe aortic and mitral insufficiency (normal previous echocardiograms) with preserved LVEF, without vegetations. PET was performed, with no metabolic increase at the cardiac level.

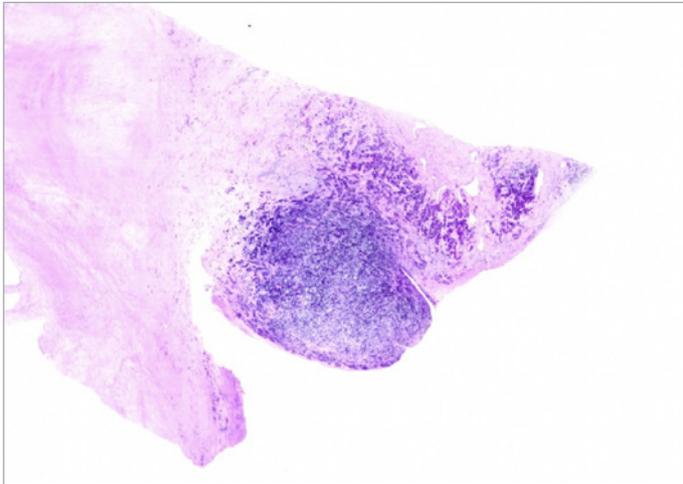
**Findings:** Digestive samples showed positive PCR for *T. whipplei*. Subsequently she required a new admission due to fever and generalized deterioration without improvement with antibiotics, leading to a new outbreak of his underlying illness and improving with corticosteroids. During this admission she presented symptoms of congestive heart failure with dyspnoea on minimal exertion. We contacted with the cardiac surgeons and for deciding on aortic and mitral valve replacement surgery, sending samples to pathological anatomy to screen for valve involvement by *T. whipplei*, which were positive.

After surgery, the patient presented biventricular dysfunction, requiring support with levosimendan and optimization of medical treatment by the Heart Failure Unit.

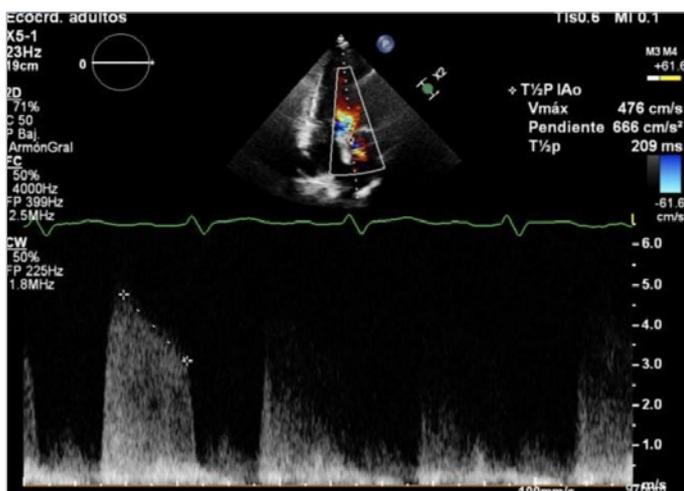
**Conclusions:** Endocarditis due to *T. whipplei* can have different types of presentation and severity. This case incites us to take into account the entire context of the patient and shows that

interdisciplinary management helps in the best approach to patients.

**Keywords:** endocarditis, whipple, diarrhea



**Figure 1.** Mitral valve sample with vegetation (purple color). Histiocytes loaded with *T. whipplei*.



**Figure 2.** Transthoracic echocardiogram showing aortic insufficiency.

[Abstract:1545]

## CLINICAL ULTRASOUND MONITORING OF CONGESTIVE HEART FAILURE

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**Purpose:** To use clinical ultrasound markers to monitor the evolution of systemic and pulmonary congestion in patients hospitalised for heart failure in the Department of Internal Medicine.

**Methods:** Prospective cohort study of adult patients with a primary diagnosis of decompensated heart failure. Congestion

variables were collected within 24 hours of admission (jugular vein [JV] distensibility < 17%, number of B-lines [BL], pleural effusion [PE], inferior cava vein [ICV] diameter > 2.2 cm and/or collapsibility < 50%, and venous excess ultrasonography score [VExUS]), on day 3 (pulmonary and VExUS), and at discharge (JV, pulmonary, ICV, and VexUS).

**Findings:** The study comprised thirty patients (mean age 82.53 years, 57% women) primarily suffered from hypertensive-induced heart failure and mainly triggered by respiratory issues. Variables associated with the typical evaluation of congestion were Everest index exceeding 1; with chest X-ray, NT-proBNP level and NYHA indicating moderate/severe congestion. Initial echocardiograms indicated hypertrophic left ventricles (76.7%) with preserved function (70%) and valvular involvement (76.7%).

Throughout hospitalization, ultrasound assessments showed a reduction in congestion from admission to discharge, including decreasing congestive ICV (from 76.6 to 73%), B-lines ( $\geq 7$  from 76.6 to 50%), and VExUS (moderate/severe from 40 to 3.8%). Statistical analysis indicated significant differences in successive measurements of B-lines, ICV, VexUS ( $p < 0.01$ ), and JV ( $p < 0.05$ ).

**Conclusions:** Clinical ultrasound markers of congestion on admission align with typical clinical and analytical parameters in use. Repeated assessment of patients via clinical ultrasound permits monitoring congestion evolution throughout hospital admission for heart failure.

**Keywords:** heart failure, ultrasonography, cardiac oedema

[Abstract:1547]

## IMPACT OF CLINICAL ULTRASOUND ON HEART FAILURE QUALITY INDICATORS IN INTERNAL MEDICINE

Jaime Gil Rodríguez<sup>1</sup>, Javier Martínez De Victoria Carazo<sup>1</sup>, Fidel Moreno Verdejo<sup>1</sup>, Irene González Fernández<sup>2</sup>

<sup>1</sup> Hospital Universitario Clínico San Cecilio, Internal Medicine Department, Granada, Spain

<sup>2</sup> Universidad de Granada, Medicine Faculty, Granada, Spain

**Purpose:** To evaluate the effects of clinical ultrasound on prognostic indicators in heart failure hospitalised patients.

**Methods:** Prospective cohort study of adult patients with a primary diagnosis of decompensated heart failure. Congestion variables were collected within 24 hours of admission (jugular vein [JV] distensibility < 17%, number of B-lines, pleural effusion, inferior cava vein [ICV] diameter > 2.2 cm and/or collapsibility < 50%, and venous excess ultrasonography score [VExUS]), on day 3 (pulmonary and VExUS), and at discharge (JV, pulmonary, ICV, and VexUS).

**Findings:** The study comprised thirty patients (mean age 82.53 years, 57% women) primarily suffered from hypertensive-induced heart failure and mainly triggered by respiratory issues. Variables associated with the typical evaluation of congestion were Everest index exceeding 1; with chest X-ray, NT-proBNP level and NYHA

indicating moderate/severe congestion. Initial echocardiograms indicated hypertrophic left ventricles (76.7%) with preserved function (70%) and valvular involvement (76.7%).

Comparison of the mean length of stay for patients with heart failure in Internal Medicine in 2022 (10.71 days) and our sample (8.93 days) resulted in a p-value of 0.0312. The comparison of mortality ratios for patients with heart failure in Internal Medicine in 2022 (25%) and our sample (13.3%) yielded a p-value of 6.177e-15. No readmissions were observed.

**Conclusions:** The study results indicate that the systematic integration of clinical ultrasound for heart failure patient management has a favourable impact on quality-of-care parameters. This includes a decrease in mortality, average duration of stay and readmission rate compared to the preceding year.

**Keywords:** heart failure, ultrasonography, mortality

[Abstract:1555]

## FROM FEVER WITHOUT FOCUS TO TRIPLE VALVULAR INTERVENTIONISM

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**Description:** 53-year-old male with a personal history of arterial hypertension, atrial fibrillation, severe aortic regurgitation, moderate mitral regurgitation and tricuspid regurgitation. Admitted for fever of 15 days of evolution and chest pain.

### Exploration and Complementary Tests:

- Glasgow 15/15. Normotensive. HR 98 bpm, absence of stigmata of endocarditis.
- ACP rhythmic tachycardic tones with panfocal systolic murmur and scattered crackles. Lower limbs oedematous up to the knees.
- ANL: NT-proBNP 8589 pg/mL.
- TEE: Trivalve aortic valve with thickened and fibrous leaflets, without images suggesting acute vegetation although old infection cannot be ruled out. Slight retraction of the leaflets causing mild stenosis and severe regurgitation, jet covering more than 50% of the LVOT (left ventricular outflow tract) and reaching the posterior wall of the LV.

Mitral valve with thickened and fixed anterior leaflet with normal opening and severe central regurgitation (intense holosystolic jet, with inversion of pulmonary vein flow). No images of vegetation in the mitral leaflets. Severe tricuspid regurgitation.

### Clinical Judgment:

- Suspected infective endocarditis.
- Severe mitral regurgitation.
- Double aortic lesion with severe regurgitation.
- Severe tricuspid regurgitation. The patient undergoes surgery, being performed:
  - 1)Aortotomy, resection of ascending aorta and replacement by

Dacron supracoronary tube.

- 2)Resection of native aortic valve, found severely destructured with some fenestrations and perforation in the right coronary leaflet and replacement by mechanical prosthesis.
- 3)Right aortotomy, transseptal access and resection of native mitral valve, replaced by mechanical mitral prosthesis.
- 4 Tricuspid plasty.

**Keywords:** fever, valvular endocarditis, sever aortic regurgitation, mitral regurgitation

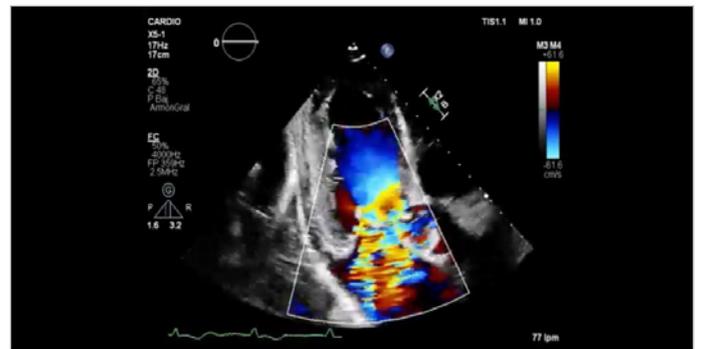


Figure 1. Mitral Regurgitation

[Abstract:1572]

## PROGNOSTIC USE OF AN ABC SCORE IN ATRIAL FIBRILLATION AND HEART FAILURE WITH PRESERVED EJECTION FRACTION. AN ANALYSIS OF THE RICA REGISTRY

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**Summary:** The CHA2DS2-VASC score is useful to evaluate the risk of ischemic events in atrial fibrillation (AF). Additionally, may have prognostic value in heart failure with preserved ejection fraction (HfpEF). However, this score has some inconvenient when applied on specific populations. New scores such as ABC (age, biomarkers, clinical history) are being developed to improve predictions in this regard.

**Purpose:** To develop an ABC score to predict outcomes in patients with AF and HFpEF.

**Methods:** Patients belonging to RICA registry, with HFpEF and AF were analysed. Through logistic regression that included: Age, NT-proBNP, uric acid, creatinine, and Charlson comorbidity index (CCI), we elaborated a nomogram (Figure 1). As a result, we got the probability to die which splitted into quartiles. We compared the accuracy of our score with the CHA2DS2-VASc score, through ROC curves and Kaplan-Meier curves.

**Findings:** 1,250 patients (81.8 ± 7.1 years, 61.9% female) were analysed. Their NT-proBNP mean was 5,016,1 ± 5,531,4 and

their CCI  $2.9 \pm 2.4$ . The area under the curve of the CHA2DS2-VASc score was 0.76, meanwhile our score was 0.87. The Kaplan-Meier curves (Figure 2) showed a better accuracy of our model ( $P=0.001$ ) than that of CHA2DS2-VASc score ( $p=0.062$ ).

**Conclusions:** Our ABC score was more reliable to predict mortality than the CHA2DS2-VASc in patients with AF and HFpEF. However, it should be validated for ischemic and haemorrhagic events, which were not recorded at the RICA registry.

**Keywords:** atrial fibrillation, heart failure with preserved ejection fraction, ABC score

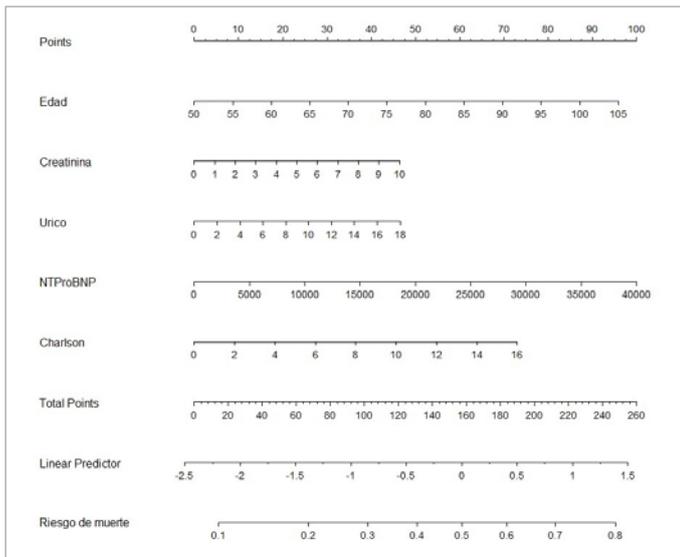


Figure 1. Nomogram of Charlson comorbidity index

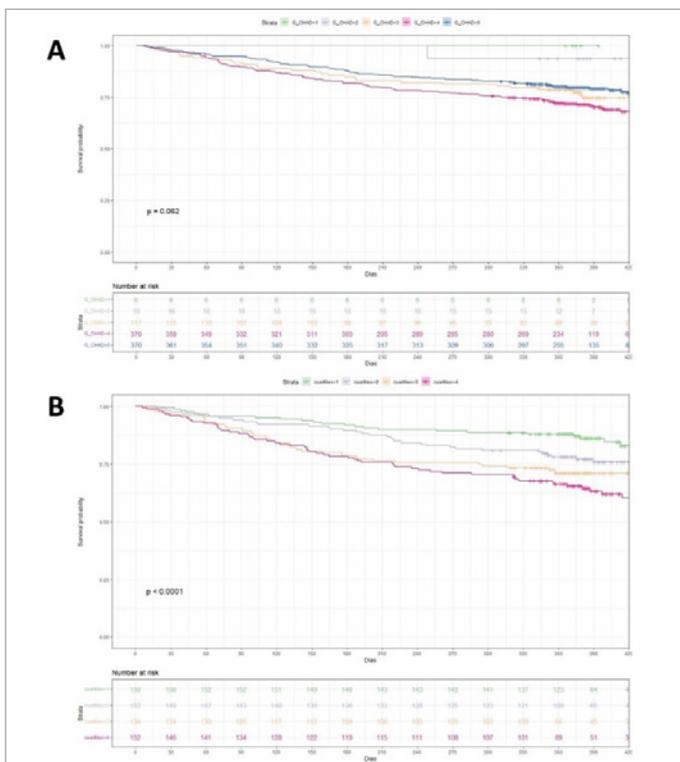


Figure 2. Kaplan-Meier curves.

Panel A: CHA2DS2-VASc score. Panel B: ABC score.

[Abstract:1590]

## HEART FAILURE IN AN INPATIENT SETTING: A PORTUGUESE OBSERVATIONAL RETROSPECTIVE STUDY

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<sup>2</sup> Hospital Professor Doutor Fernando Fonseca, Medicina 4, Amadora, Portugal

<sup>3</sup> NOVA Medical School, Faculdade de Ciências Médicas, LisboaHeart Failure (HF) is the main cause of hospital admission and it requires comprehensive management.

The aim of this study was to describe a population with HF admitted into an Internal Medicine ward from July-December 2022. Clinical records were accessed to determine demographic characteristics, comorbidities, heart disease's aetiology, left ventricular ejection fraction (LVEF) and drugs at discharge date.

From 587 hospitalizations, 190 (32.4%) corresponded to patients with HF. 52.6% were women, median age was 84 (76-88.75) years. The most prevalent comorbidities were hypertension (80.1%), chronic kidney disease (CKD) (35.3%) and diabetes (34.2%).

Concerning LVEF 55.2% had preserved, 12.1% mildly reduced, 15.8% reduced and 16.8% did not had previous echocardiographic characterization. Ischemic (27.4%) were the most common aetiology followed by hypertensive (21.1%), valvular (13.2%) and mixed (16.3%).

In 94 (16%) episodes decompensated HF was the hospitalization admission cause. In this group, median length of stay was 11 (7-15) days; Cardio-Renal Syndrome was present in 29.8%, CKD was a risk factor ( $p=0.005$ ); and mortality was 9.6%.

At discharge, to HF patients the most prescribed drugs were beta-blocker (73.1%), ACEI/ARB (58.3%), furosemide (51.3%) and iSGLT2 (33.1%).

In patients with reduced LVEF to 80.8% were prescribed ACEI/ARB±Neprilysin, 73.1% iSGLT2, 69% beta-blocker, 61.5% loop diuretic and 42.3% anti-aldosterone. The main physicians' difficulties in optimizing prognosis-modifying therapy were related to patients' socioeconomic factors (19.2%), hyperkalaemia, hypotension, recent acute kidney injury (all 15.4%) and bradycardia (7.7%).

The management of HF is a complex task that must be mastered by Internists in order to decrease HF hospitalizations and mortality.

**Keywords:** heart failure, inpatients, observational study

[Abstract:1619]

## FULMINANT DEATH DUE TO CONSTRICTIVE PERICARDITIS

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A 48-year-old man, was admitted to our hospital referring cough with bloody sputum, progressive dyspnoea and chest discomfort. Physical examination revealed tachycardia and global hypoventilation. Blood tests showed D-dimer (4.95 mg/L), C-reactive Protein (151 mg/L) and NT-proBNP (2312 pg/ml) elevation. High sensitive troponin (TnT) and PCR respiratory viruses were normal. EKG detected atrial fibrillation at 170 bpm. Chest X-ray and thoracic tomography revealed intense pericardial calcification. Transthoracic echocardiogram showed diastolic dysfunction, partially collapsed right ventricle, septal shift to the left ventricle with inspiration and respirophasic variation with increased inspiratory flow in right chambers and reduced flow in left, circumferential pericardial calcification with constrictive signs. The etiologic study including autoimmunity, viral serology, parasites and QuantiFERON, was negative. Days after admission, the patient died suddenly in his sleep. Constrictive pericarditis is a rare but disabling entity produced by chronic inflammation of the pericardium, causing alteration of ventricular filling and reduction of its function. The main aetiology is idiopathic or viral, followed by cardiac surgery, mediastinal radiotherapy and tuberculosis. Differential diagnosis includes acute dilated cardiomyopathy, pulmonary thromboembolism, right ventricular infarction, pleural effusion, chronic obstructive pulmonary diseases, and restrictive cardiomyopathy. Age, advanced functional class, and previous acute idiopathic pericarditis are associated with higher mortality, especially in relation to low cardiac output due to acute heart failure, secondary to myocardial atrophy and fibrosis. Pericardiectomy is the only treatment for permanent constriction.

**BIBLIOGRAPHY:** Quispea R, Villablancab PA, García M. Pericarditis constrictiva: multimodalidad. Rev Colomb Cardiol. 2019; 26(S1)123--133.

**Keywords:** dyspnea, calcification, pericarditis, echocardiogram, pericardiectomy

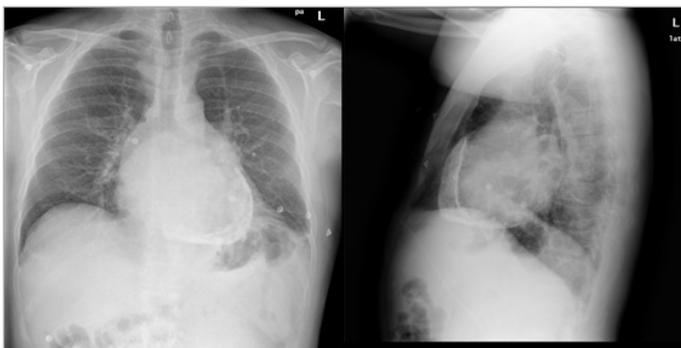


Figure 1.

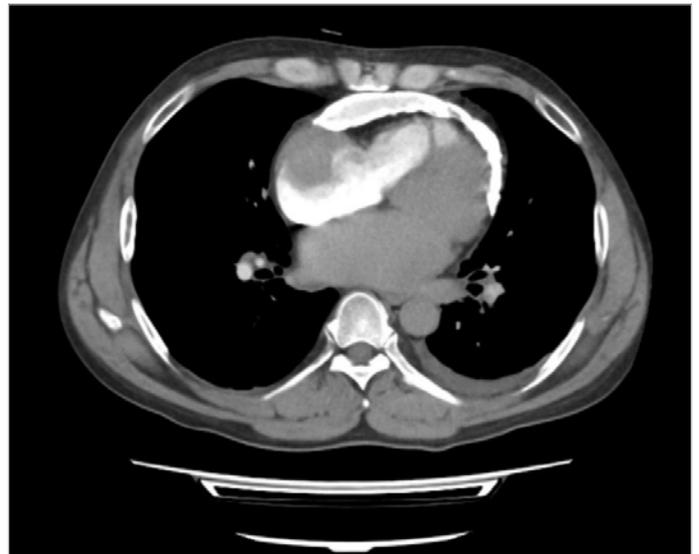


Figure 2.

[Abstract:1627]

## INTENSIVE CARE AND HYPERTENSION

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**Case Description:** A 72-year-old woman with a history of hypertension and essential tremor. Transthoracic echocardiography identifies concentric left ventricular hypertrophy with dynamic obstruction of the left ventricular outflow tract by septobasal surround and left ventricular diastolic dysfunction.

Admitted for quadrant breast resection for infiltrating breast carcinoma. No incidents during surgery.

During the postoperative period she presented an episode of acute hypoxemic respiratory failure with respiratory work associated with arterial hypertension secondary to acute pulmonary oedema, which improved after initiation of NIMV and diuretics; after a second episode ICU is contacted.

### Exploration and complementary tests:

- Neurological: On arrival in ICU the patient without analgesic drugs Glasgow 3/11 points (Ao 1 Rv 1 Rm 1) with anisocoria.
- Respiratory: Connected to MV, the patient has abundant secretions through endotracheal tube with marked hypoxemia SpO<sub>2</sub> 80%.
- Hemodynamic: hypotension BP 45/30mmHg; HR 50lpm; Afebrile.
- Renal / Metabolic: Oligoanuria; respiratory acidosis; GSV: pH 7.14; pCO<sub>2</sub> 68; HCO<sub>3</sub> 23; lactic 6.2.
- ECG: sinus rhythm 61 bpm; PR 130; QRS 100; No acute repolarization alterations.
- Chest X-ray: bilateral interstitial infiltrate of left predominance

without condensation images. Isolated costophrenic sinuses. Cardiac silhouette not enlarged.

- CBC haemoglobin 13.8 g/dL; NT-proBNP 655;  $\approx$  14,665 pg/mL (peak value); Other parameters were normal. Clinical Judgment: Acute pulmonary oedema secondary to left ventricular diastolic dysfunction.

**Keywords:** intensive care, acute heart failure, left ventricular hypertrophy

[Abstract:1628]

## AN UNSUSPECTED DEBUT OF HEART FAILURE

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We present a male patient of 70 years feeling effort dyspnoea for a month with bimalleolar oedema, nocturia and paroxysmal nocturnal dyspnoea. He also has finger's paresthesias for the last weeks and 5 kg of loss. As medical history, he has benign prostatic hyperplasia. Not chronic treatment.

The physical examination shows an abolition of vesicular murmur up to middle fields bilaterally and pitting oedema in both legs.

At the blood test is found a NT-proBNP of 8363 pg/ml, being the rest of it normal. The chest X-ray showed a bilateral pleural effusion. The patient is admitted for suspecting a heart failure's (HF) debut. We found out that he had a proteinogram with a monoclonal IgA Lambda component of 12% four months before. Then, we ordered a myeloCT and a bone marrow biopsy to rule out multiple myeloma. The biopsy was compatible with multiple myeloma with infiltration by neoplastic plasma cells with no amyloid detected. We had a high suspicion of primary amyloidosis (bilateral carpal tunnel syndrome, HF, myeloma). The echocardiogram performed showed a severe hypertrophy of the left ventricle with a mottled, granulated appearance ("sparkling"). Afterwards a cardiac gamma-ray scan was made, compatible with grade 3 of cardiac amyloidosis (Figure 1). The patient got worse with severe kidney failure that was biopsied showing green-apple birefringence, confirming our diagnosis.

Two months later the patient died.

In conclusion, cardiac amyloidosis due to light chain deposition is a severe disease with a survival of 4-6 months, with few therapeutic resources beyond symptomatic treatment.

**Keywords:** amyloidosis, heart failure, myeloma

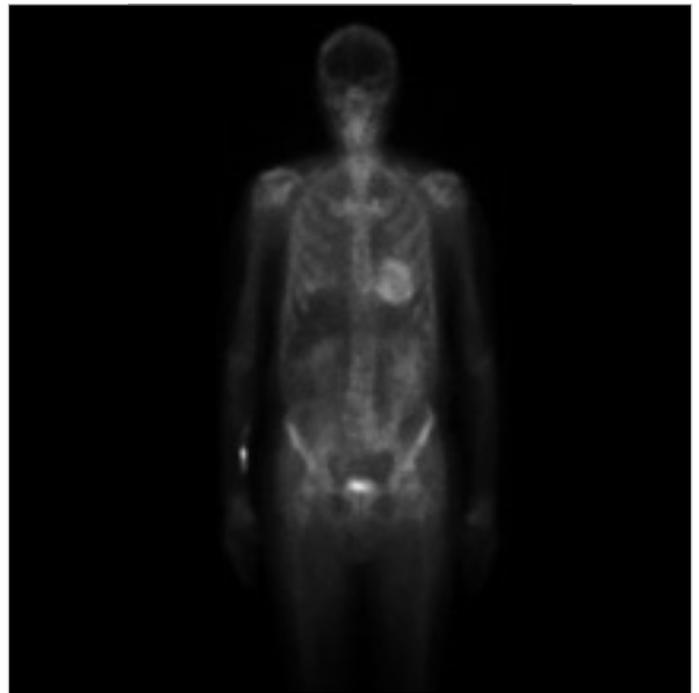


Figure 1. Gamma-ray scan with cardiac amyloidosis grade 3.

[Abstract:1636]

## CASE REPORT OF THYROTOXIC HEART

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**Summary:** A clinical case of rapid development of permanent atrial fibrillation (AF), with rapid progression of dilatation of all heart chambers and development of chronic heart failure (CHF) with reduced left ventricular ejection fraction (LVEF) on the background of thyrotoxicosis syndrome.

**Purpose:** Graves' disease (GD) and thyrotoxicosis syndrome is a common thyroid pathology, but its cardiovascular complications can often be mistaken as unrelated to thyrotoxicosis due to the non-specificity of symptoms, low incidence and low awareness of clinicians, making diagnosis and therapy difficult.

**Methods:** A 54-year-old male patient with 3 months of progressive weakness, dyspnoea, palpitations, weight loss. On admission on 10/2022, dilatation of all heart cavities, persistent form of AF, CHF with reduced LVEF (31%) were detected. During examination ischaemic, infectious genesis of heart lesion was excluded, thyrotoxicosis was revealed. Cardiotropic and thyrotropic therapy was prescribed.

**Findings:** The re-examination on 01/2023 revealed no dynamics, preservation of thyrotoxicosis. Due to presence of severe complications, total resection of the thyroid gland was performed, and substitution therapy was selected. In 6 months, regression of clinical symptoms was achieved, sinus rhythm was spontaneously restored, heart cavity reduction, LVEF increased to intermediate (46%).

**Conclusions:** Due to the variety of cardiac lesions and the absence of specific symptoms, there are difficulties in identifying the cause of cardiac damage. The development of AF against the background of thyrotoxicosis often causes rapid persistence of AF and the development of CHF III-IV class with LVEF below 50%, with male gender associated with a more severe course.

**Keywords:** Graves' disease, atrial fibrillation, dilated cardiomyopathy

[Abstract:1637]

## RENAL ARTERY STENOSIS DUE TO COCAINE ABUSE - A CASE REPORT

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**Background:** Narrowing of the one or both renal arteries is defined as renal artery stenosis. Cocaine is an illicit drug which causes many kidney pathologies including rhabdomyolysis, thrombotic microangiopathy, renal vasculitis and renal infarction.

**Case:** We present a 34-year-old male patient presenting with unilateral renal artery stenosis and total occlusion due to cocaine abuse who first appeared at general surgery outpatient service with flank pain and hypertension. He later admitted using cocaine 15 hours before admission to hospital. Contrast-enhanced abdominal CT findings were coherent with left renal artery infarct and nutcracker syndrome. Blood tests showed creatinine rise to 1.22mg/dl (Egfr:71) on admission and ranged between 0.8-1.43. Autoimmune markers including p-ANCA, c-ANCA, ANA were analysed for the differential diagnosis with vasculitis. ANA, p-ANCA and c-ANCA were negative. Renal artery angiography showed stenosis and total obstruction of the left renal artery lower branch.

**Conclusions:** There are only two case reports regarding cocaine abuse induced renal artery dissection, twelve renal artery infarction and one regarding renal artery stenosis although it is well known that it may cause many kidney and cardiovascular pathologies including atherosclerosis and hypertension. We considered it is appropriate to report the case as it is a rare complication of the cocaine abuse and think that it is important to keep cocaine and drug abuse in mind in differential diagnosis when evaluating abdominal pain in young patients and vasculitis like appearance of renal artery on renal doppler ultrasonography or abdominal CT imaging.

**Keywords:** cocaine, renal artery, stenosis

[Abstract:1640]

## HIV, MEDITERRANEAN DIET, AND ATHEROSCLEROSIS. THE FORGOTTEN ROLE OF POLYMORPHONUCLEAR NEUTROPHILS

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**Background:** HIV-associated persistent inflammation is a proatherogenic factor. Polymorphonuclear neutrophils (PMN) have not been studied in this context. By forming neutrophil extracellular traps (NETs), made up of DNA, histones and antimicrobial proteins, PMN trap pathogens and other particles, such as platelets, accelerating coagulation.

**Objectives:** To assess NETs and their relationship with cardiovascular risk in patients living with HIV (PLWH), and the modulating effect of the Mediterranean diet (Md).

**Methods:** Carotid intima-media thickness (CIMT) as surrogate marker of atherosclerosis and metabolic parameters, smoking habits, arterial pressure, CD4/mm<sup>3</sup>, serum levels of 16S rDNA, interleukin 6 (IL6) and E-selectin, 16S rDNA, adherence to Md and quantification of NETs were assessed in 40 PLWH with undetectable HIV load and 40 healthy controls. Variables were compared using the chi-square test or the Mann-Whitney U test. Correlation between variables was analysed by Spearman test.

**Results:** CIMT was higher and positively correlated with cardiovascular disease risk indices in PLWH. Good adherence to Md leads to a significantly lower CIMT. Increased 16S rDNA (bacterial translocation marker) and macrophage (IL6) and endothelial (E-selectin) activation levels were detected in PLWH. PMNs expressing NETs were increased. NETs proportion positively correlated with 16S rDNA levels and CIMT. Good adherence to Md was negatively correlated with NETs.

**Conclusions:** A negative association between atherosclerosis and good adherence to Md in PLWH is demonstrated, possibly through a decrease in intestinal bacterial translocation and inflammatory activation, mediated, in part, by NETs. NETs formation should be included among the proatherogenic factors in PLWH.

**Keywords:** HIV, NETs, atherosclerosis, Mediterranean diet

[Abstract:1650]

## NEED FOR A GLOBAL APPROACH TO PREVENT ARTERIOSCLEROSIS, A DISEASE WITH MULTIFACTORIAL CAUSES

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88-year-old male, former tobacco user, HTN, DM2, dyslipidaemia, congestive heart failure with EFr after Killip III AMI. COPD GOLD III exacerbator, with home oxygen. Consultation due to progressive increase in dyspnoea, reduction in diuresis, as well as mucus. On examination, he was tachypnoeic, SatO<sub>2</sub> 80% and needed support with ventimask 10l. Examination: bilateral expiratory wheezing is noted. Marked abdominal indrawing. Oedema in lower limbs. Analytical: Hb 9.7 g/L (N-N), Urea 154, Cr 3.9 mg/dL and GFR 32 ml/min. Ions: Na 138; K 3.9; EAB pH 7.3; bicarbonate 30.6mmol/L; pPCO<sub>2</sub> 74.7mmHg; CRP 20mg/l; NT-proBNP 48880. Urine: urea 1618 mg/dl; Cr 64.1 mg/dl; Na 27 mmol/L; K 23.2 mmol/L. Chest X-ray with increased ICT and bilateral pleural effusion. Enter Internal Medicine:

1) CHF: after 400 mg of furosemide IV/24h without success, a bolus of furosemide + SSH is used as well as double neurohormonal blockade with hydrochlorothiazide and acetazolamide. After stability, disease-modifying drugs are started: cardioselective BB, sacubitril/valsartan 24/26 mg and empagliflozin 10 mg. ARM does not start at the moment.

2) CKD: baseline creatinine around 1.95-2 mg/dL after ARNI, and ISGLT-2 in stable but congestive phase (secondary benefit aGFR). Manidipine is added to improve renal hemodynamics. Hb goals > 8 g/dL.

Metformin is changed to alogliptin + empagliflozin given the patient's profile, as well as atorvastatin 20mg/ezetimibe 10mg.

3) COPD: respiratory support and IV corticosteroids are started. At discharge, triple therapy on device (simplification), with rescues with atrovent, NIV in home P/S BiPAP mode and portable oxygen therapy, to improve autonomy.

**Keywords:** multifactorial, heart failure, chronic kidney disease

[Abstract:1656]

## ANALYSIS OF THE PARAMETERS OF THE DIAGNOSTIC INFORMATION CONTENT OF THE CARDIOVASCULAR RISK ASSESSMENT CALCULATOR

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The study included 195 patients with peripheral atherosclerosis. Patients had their complaints collected, and their medical history and objective status were analysed. Standard laboratory tests were carried out to evaluate lipid profile indicators, complex of instrumental studies and examination of the cardiovascular system. In the course of the work, a risk assessment calculator was developed; the most pronounced prognostic significance for assessing the risk determined in the work had such factors as the presence of hemodynamically significant peripheral atherosclerosis, the value of the atherogenic index, glycated haemoglobin, gender of patients and age, biological vascular age, and augmentation index. These factors were included in the model. When conducting ROC analysis, the value of the prognosis criterion was established, on the basis of which it was concluded that there is a high risk of developing adverse cardiovascular events and long-term outcomes in patients with peripheral atherosclerosis. The parameters of the diagnostic information content of the calculator were assessed and the analysed risk was compared with the indicators of the EUROASPIRE Risk Calculator scale. Assessment of CVD risk 1 and CVD risk 2, according to the EUROASPIRE calculator, demonstrated that all 195 patients had a high risk. But cardiovascular events and adverse outcomes developed in only 23.1%. Thus, the median CVD risk 1 was 15%, the interquartile range was 13–19%, and the range was 8–29%. The median CVD risk 2 corresponded to 32%, the interquartile range was 28–35%, and the range was 18–55%. Consequently, the specificity of the EUROASPIRE calculator turned out to be low.

**Keywords:** risk assessment calculator, unfavourable long-term prognosis, atherosclerosis

[Abstract:1679]

## RELATIONSHIP BETWEEN PCSK9 LEVELS AND THE DIFFERENT GENETIC MUTATIONS PRESENT IN INDIVIDUALS WITH HETEROZYGOUS FAMILIAL HYPERCHOLESTEROLEMIA

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**Background:** Heterozygous familial hypercholesterolemia (HF) is a prevalent genetic disorder globally, due to mutations in *LDLR*, *ApoB*, *ApoE*, and *PCSK9* genes. Its clinical importance stems from its association with early-onset coronary disease, underscoring the need for biomarkers to personalize cardiovascular (CV) risk assessment. This study investigates the relationship between PCSK9 levels and genetic mutations in HF patients, to develop tailored strategies for reducing their CV risk, according to principles of precision medicine.

**Methods:** This is a cross-sectional descriptive study on a prospective cohort of 403 HF patients (SAFEHEART cohort). It included patients >18 years with HF and their relatives, encompassing anthropometric, biochemical, and clinical data, along with genetic diagnosis. PCSK9 levels were measured using ELISA. The relationship between PCSK9 levels and various mutations in HF patients, as well as the correlation with biochemical and lipid parameters, was analysed.

**Results:** Individuals with *LDLR* gene mutation had higher PCSK9 levels than those without the mutation. Patients with *ApoB* gene mutation had lower PCSK9 levels compared to non-mutated individuals. Additionally, PCSK9 levels positively correlated with LDL, total cholesterol, glucose, and serum ApoB levels.

**Conclusions:** Understanding how PCSK9 levels are influenced by genetic mutations in HF can facilitate personalized CV risk prediction and optimize treatment strategies. Our findings highlight the potential of PCSK9 as a biomarker in managing HF patients, particularly in guiding therapeutic decisions to mitigate CV risk.

**Keywords:** PCSK9, familial hypercholesterolemia, genetics

[Abstract:1681]

## CARDIOMETABOLIC RISK FACTORS AMONG INDIVIDUALS AT RISK OF FOOD INSECURITY ACCORDING TO ECONOMIC FACTORS AND SEX: FROM THE E-DUCASS STUDY

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**Aim:** Socioeconomic factors are one of the main determinants of public health, increasing the prevalence of chronic non-communicable diseases. This study evaluates the association between sex, family income, and cardiometabolic risk factors in the E-ducass study.

**Methods:** We performed a cross-sectional observational study of the e-ducass study population (NCT05379842) including sociodemographic, anthropometric, biochemical, and clinical data from 460 vulnerable individuals at risk of food insecurity. In addition, income levels were categorized as <€500, €500-€1000, and >€1000 per family unit.

**Results:** Among participants (average age 32.1 years; 57.9% female), 39.9% were obese, and 20.6% overweight. Women exhibited higher BMI (28.6 vs. 27.1 kg/m<sup>2</sup>, p<0.01), lower glucose (96.1 vs. 102.7 mg/dl, p<0.01), triglycerides (146.7 vs. 176.2 mg/dl, p<0.01), and systolic blood pressure (114 vs. 122 mmHg, p<0.01) compared to men. Women also had higher rates of obesity (44.4% vs. 33.7%, p=0.02) and abdominal obesity (55.4% vs. 39.4%, p<0.01). No sex-based differences were noted in hypertension, metabolic syndrome, or other comorbidities (diabetes, heart disease, cancer, COPD, or liver disease). Income level did not significantly affect the prevalence of obesity, hypertension, metabolic syndrome, or comorbidities. 52.8% reported income <€500, correlating with increased food insecurity (94.1% <€500 vs. 75.8% >€1000, p=0.02).

**Conclusions:** There was a high prevalence of obesity and food insecurity, particularly among women and lower-income households. This could increase long-term cardiovascular risk in a vulnerable population at risk of food insecurity.

**Keywords:** cardiovascular disease, food insecurity, digital intervention

[Abstract:1685]

## STUDY OF HEART RATE VARIABILITY IN BEHÇET'S DISEASE

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**Introduction:** Behçet's disease (BD) is a multisystemic vasculitis. There is little knowledge about the mechanism of ventricular arrhythmias in BD. The autonomic nervous system (ANS) has an important role in the triggering of ventricular arrhythmias. The aim to this study was to investigate ANS by measuring heart rate variability (HRV) in BD patients.

**Methods:** We conducted a prospective cross-sectional comparative pilot study. We selected two groups of patients. The first one was composed by BD patients without cardio-vascular co-morbidities and the second by healthy individuals control group. The two groups were matched with respect to age, sex, body mass index, blood pressure and conventional tissue Doppler parameters of transthoracic echocardiography measurements. The parameters of HRV were gathered from a 24-h electrocardiogram recording.

**Results:** We included 36 patients in each group. Patients with BD had significantly lower values of the standard deviation of all RR intervals (SDNN) compared to controls. The percentage of all adjacent RR intervals differing by more than 50 milliseconds (PNN-50), the root mean square difference between consecutive RR intervals, and the high frequency power (HF) components median values were significantly reduced in patients than in controls implying parasympathetic impairment. The low frequency power (LF) was comparable between the two groups, whereas LF/HF ratio was significantly higher in BD group.

**Conclusions:** The role of the ANS in the pathogenesis of ventricular arrhythmias is well established. Patients with BD have reduced parasympathetic activity compared with controls. HRV can be an interesting approach for the rhythmic follow-up of BD patients.

**Keywords:** Behçet's disease, autonomous nervous system, heart rate variability, arrhythmias

[Abstract:1689]

## A DESCRIPTIVE STUDY OF CRYPTOGENIC STROKE

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**Objective:** Study the frequency of atrial fibrillation in patients diagnosed with embolic stroke of undetermined origin (ESUS).

ESUS is a subtype of cryptogenic stroke with the following characteristics: non-lacunar ischaemic lesion responsible for symptoms detected by imaging, absence of extracranial or intracranial atherosclerosis causing luminal stenosis  $\geq 50\%$ , absence of a source of high-risk cardioembolic embolism after adequate study (electrocardiogram, 24-hour Holter and echocardiogram) and absence of another specific cause of cerebral stroke.

**Methods:** A prospective longitudinal descriptive study of patients diagnosed with ESUS between June 2021 and July 2022 at the Hospital Comarcal Básico Santa Ana in Motril.

Epidemiological data, cardiovascular risk factors and studies performed during hospitalisation were recorded in the database of ESUS. We selected patients who met high-risk criteria for atrial fibrillation, obtaining a total of 8 patients. These patients underwent long-term monitorization with an implantable heart monitor to detect atrial fibrillation.

**Results:** For the diagnosis of cryptogenic stroke with high-risk of atrial fibrillation, we used the criteria established in "Review and update of the concept of embolic stroke of undetermined source": age  $>60$  years (87.5% of our patients), brain imaging with multilobar infarction or previous cortical or cerebral infarction (100%), high-risk echocardiogram: ejection fraction  $<40\%$  or atrial dilatation  $>45$  mm (75%), high-risk 24-hour Holter: supraventricular extrasystoles  $>360/24$  hours or atrial tachycardia  $>20$  successive beats/24 hours (12.5%) and NT-proBNP  $>360$  ng/l (75%). Of the 8 patients with implantable heart monitor, atrial fibrillation was detected in 4 of them (50%) in a mean period of 38 days (4-117).

**Keywords:** embolic stroke of undetermined origin, atrial fibrillation, implantable heart monitor

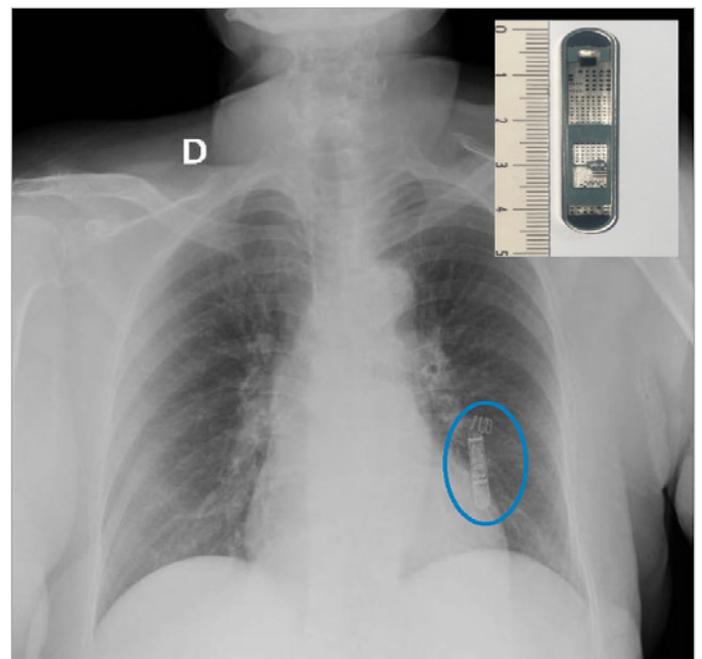


Figure 1. Implantable heart monitor.

[Abstract:1703]

## THE SILENT CLINIC OF PERIPHERAL ARTERIAL DISEASE

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A 60-year-old man with a complex vascular history, including hypertension, insulin-dependent type 2 diabetes of over a decade with poorly managed glycaemic levels, severe non-proliferative diabetic retinopathy, hypercholesterolemia, atherothrombotic ischemic stroke in the left middle cerebral artery, small vessel ischemic disease leading to cognitive impairment, and treated obstructive sleep apnoea using CPAP. He presented to the emergency department with intermittent claudication in the lower limbs for several months, a painful lesion on the head of the first metatarsal of the right foot for one month, fever and erectile dysfunction. The physical examination revealed diminished femoral and pedal pulses, ankle-brachial indices of 0.30 in the right leg and 0.25 in the left leg, and a pinpoint lesion with local cellulitis on the first metatarsal of the right foot. Arterial Doppler ultrasound showed permeable arteries in the right leg, with marked atherosclerotic changes observed in an angio CT. An angiogram confirmed aortic occlusion and recanalization in distal external iliac and common femoral arteries, supporting the diagnosis of Leriche syndrome. Ultimately, the patient underwent axillo-bifemoral bypass and transmetatarsal amputation of the first toe due to the infection focus. Leriche syndrome manifests as claudication, erectile dysfunction, and diminished pulses due to aortoiliac occlusion. Risk factors include hyperlipidaemia, hypertension, diabetes mellitus, and smoking. Non-invasive methods such as ankle-brachial index, continuous and pulsed Doppler ultrasound, and angio CT aid in diagnosis. Angiography is the standard diagnostic method, assisting in differential diagnosis and surgical planning. Treatment includes lifestyle measures, pharmacotherapy (cilostazol, aspirin), and endovascular surgery as the primary option.

**Keywords:** intermittent claudication, erectile dysfunction, ankle-brachial index

[Abstract:1720]

## VENTRICULAR TACHYCARDIA ELECTRICAL STORM: CORTICOIDS AS A SOLUTION

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Ventricular arrhythmias are the second most common clinical manifestation of cardiac sarcoidosis (CS), present in approximately 30% of cases, but only 5% of patients showing symptoms. Diagnosis is a challenge, and it is only established in the presence of noncaseating granuloma of myocardial. We present a case of a 74-year-old man with heart failure reduced ejection fraction by idiopathic dilated cardiomyopathy and permanent atrial fibrillation. Admitted to the emergency for sudden dyspnoea and dizziness. ECG revealed sustained monomorphic ventricular tachycardia with hemodynamic instability requiring urgent synchronized electrical cardioversion. Admitted in the Cardiology Department for further investigation. In the early days of hospitalization, he had an unfavourable evolution with HD instability with ventricular tachycardia storm, requiring mild sedation and combination of betablockers and antiarrhythmic drugs. Nevertheless, an electrophysiological study and endocardial radiofrequency ablation was needed.

However, in the first 24-48 hours after, there was an early recurrence of ventricular arrhythmias. By febrile syndrome, a thoraco-abdominal-pelvic CT scan was performed, revealing multiple large thoracic lymphadenopathies, raising the hypothesis of sarcoidosis. Given the patient's clinical and electrical instability an extracardiac instead of cardiac biopsy was performed but not conclusive. As a high suspicion of cardiac sarcoidosis empirical corticosteroid treatment was initiated and significant clinical and analytical response was noted, with the complete cessation of ventricular arrhythmias, restoration of sinus rhythm and normalization of inflammatory markers.

**Keywords:** arrhythmias, sarcoidosis, corticoids

[Abstract:1726]

## HOW IS THE CARDIOVASCULAR PROFILE IN PATIENTS REFERRED TO INTERNAL MEDICINE?

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**Objectives:** To analyse the cardiovascular profile of patients referred to Internal Medicine Unit.

**Materials and Methods:** Descriptive and retrospective study of adult patients (>18 years) referred to a Internal Medicine Unit

during a twelve-month period. Clinical variables of the selected cases were analysed using the SPSS statistical program.

**Results:** Of the total cases analysed, 74% come from primary care and the remaining 26% from other hospital care units. In terms of sex, 67% were women compared to 33% men; The proportion of women (77%) being more significant in the group referred from primary care (77%). The mean age was 55 years, with no major differences between groups (PAP and PAE). Regarding cardiovascular risk factors, in order of frequency, i) dyslipidaemia (66%), ii) arterial hypertension (58%), iii) active smoking (33%), iv) type 2 diabetes mellitus (25%); v) obesity (3%). Regarding the number of cardiovascular risk factors, 60% of the referrals had 2 or more cardiovascular risk factors and only 10% had no risk factors. The coexistence of arterial hypertension and dyslipidaemia was the most frequent association of risk factors.

**Conclusions:** The control of cardiovascular risk factors (hypertension, diabetes mellitus, dyslipidaemia, smoking, sedentary lifestyle, obesity, etc.) is essential in the prevention of cardiovascular pathology. In our population, the most frequent cardiovascular risk factors were dyslipidaemia (66%) and arterial hypertension (58%), with the coexistence of both being also frequent in patients. We consider it especially relevant to develop and implement hygiene-dietary education programs as well as promote physical activity in the general population.

**Keywords:** cardiovascular, risk factors, hypertension

[Abstract:1743]

## ACUTE MYOCARDIAL ALLERGY

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60-year-old male with multiple cardiovascular risk factors and recent myocardial infarction with stent placement in proximal circumflex artery. Presents with urinary symptoms and fever, examination is unremarkable, and tests confirm a urinary tract infection with associated mild renal failure (AKIN I). He is started on amoxicillin-clavulanate and a urinary tract ultrasonography rules out underlying alterations. On the third day of treatment he presents syncope, chest pain and dyspnoea, examination finds bronchospasm and exanthema, EKG shows inferior ST elevation (Figure 1).

Bedside cardiac ultrasound suggestive of inferior ischemia. He receives glucocorticoids, bronchodilators, antihistaminic and nitrates. Urgent coronarography rules out new alterations (Figure 2). Suspecting coronary vasospasm betablockers are suspended.

High serum tryptase (35.2 µg/L, range 1-11.4 µg/L) confirms the diagnosis.

Final diagnosis: type II Kounis syndrome secondary to betalactam antibiotics. Study is completed with total and betalactam specific IgE, basophile activation test and basal tryptase levels, all normal. This is a serious allergic reaction, a non-cardiac acute-coronary syndrome (ACS), which needs to be swiftly identified and managed. Kounis syndrome is a mast-cell induced ACS, mediators like histamine induce coronary vasospasm, and enzymes like tryptase can have an effect on coagulation (1). Clinical suspicion must be high, and we should order acute and basal serum tryptase levels. IgE and basophile activation tests do not confirm or exclude diagnosis, only the underlying mechanism of the anaphylactic reaction. It may be the first presentation of systemic macrocytosis or mast-cell activation syndrome, so it needs further evaluation and testing (2).

### References:

- DOI:10.1016/j.clinthera.2013.02.022
- DOI:10.1016/j.emc.2021.08.010

**Keywords:** Kounis syndrome, tryptase, betalactam

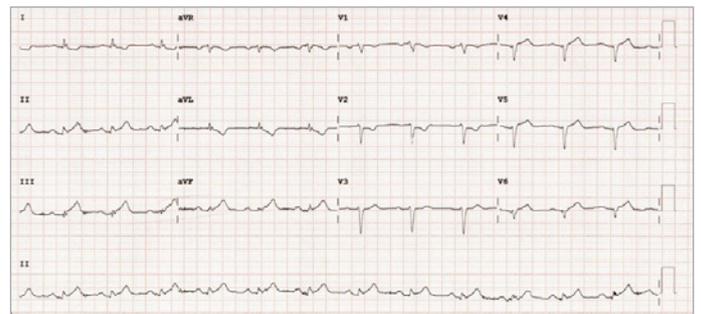


Figure 1. Electrocardiogram showing mild inferior ST elevation.

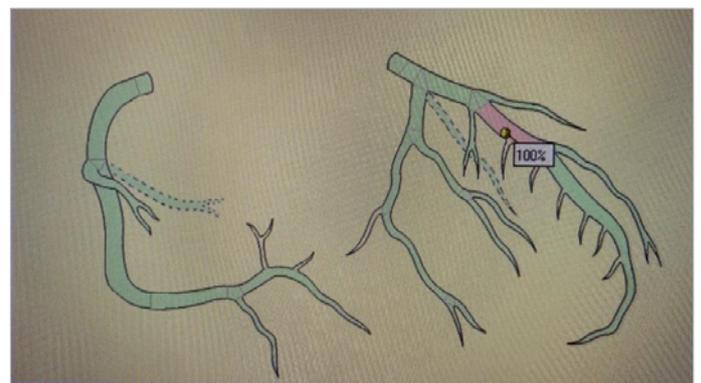


Figure 2. Coronarography results, with known chronic stenosis of anterior descendant artery and no new lesions or stenosis of previous stent in proximal circumflex artery.

[Abstract:1751]

## ASSESSING THE PROGNOSTIC SIGNIFICANCE OF BIOMARKERS FOR PREDICTING ADVERSE 30-DAYS AND 6-MONTH OUTCOMES IN PATIENTS WITH PULMONARY EMBOLISM

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**Background:** Effective risk stratification in pulmonary embolism (PE) patients is crucial. Pro BNP and serum troponin indicate myocardial damage, while serum lactate reflects tissue hypoxia. Haemoglobin, GFR, and CRP are vital parameters for short-term mortality and extend prognostic assessments to 6 months, addressing the ongoing need for precise risk evaluation in clinical practice.

**Purpose:** Evaluate the predictive value of biomarkers (Troponin I, NT-proBNP, lactate, GFR, haemoglobin, and CRP) for 30-day and 6-month mortality in 259 consecutive patients with acute PE admitted to a city clinical hospital.

**Methods:** Conducted a single-centre prospective analysis with an average patient age of 67 years (41% men). 30-day mortality was 13% (n=34), and 6-month mortality was 17% (n=44).

**Results:** Patients with 30-day mortality showed significant associations with higher NT-proBNP ( $p=0.007$ ), lower haemoglobin ( $p=0.003$ ), and reduced GFR ( $p=0.002$ ). At 6 months, non-survivors exhibited elevated NT-proBNP and CRP levels, and lower haemoglobin and GFR ( $p<0.001$ , 0.046, 0.003, and 0.001). ROC analysis identified key predictors for both 30-day and 6-month mortality. Haemoglobin  $<125$  g/l and GFR  $<49.2$  ml/min significantly predicted 30-day mortality (adjusted HR 2.99, 2.88,  $p<0.05$ ). For 6-month mortality, Hb  $<136$  g/l and GFR  $<50$  ml/min were significant predictors (adjusted HR 2.44, 2.438,  $p<0.05$ ). While CRP initially predicted 6-month mortality (HR 2.69,  $p=0.04$ ), it lost significance after adjustment.

**Conclusions:** Our study identified significant predictors of 30-day and 6-month mortality in pulmonary embolism patients, including GFR and haemoglobin levels, NT-proBNP and CRP levels showed potential as a predictor of 6-month mortality.

**Keywords:** pulmonary embolism, prognostic, biomarkers

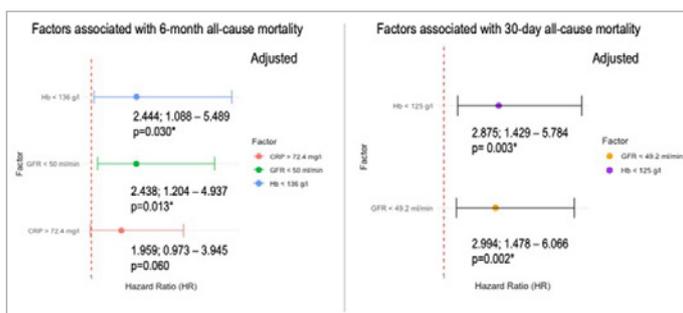


Figure 1. Multivariable analysis.

	30-day mortality status			6-month mortality status		
	Survivor (n=225)	Non-Survivor (n=34)	p	Survivor (n=215)	Non-Survivor (n=44)	p
Hb, g/l, $Q_1 - Q_3$	136 (121 - 148)	120 (110 - 138)	0,003*	136 (121 - 147)	122 (110 - 136)	0,003*
GFR, ml/min, $M \pm SD$	61 $\pm$ 19	49 $\pm$ 24	0,002*	61 $\pm$ 19	50 $\pm$ 22	0,001*
Troponin I, ng / ml, $M \pm SD$	0,40 $\pm$ 0,95	0,25 $\pm$ 0,36	0,597	0,40 $\pm$ 0,95	0,29 $\pm$ 0,53	0,475
NT-proBNP <sup>†</sup> , pg/ml, $M \pm SD$	952 (125 - 3438)	8716 (7124 - 13833)	0,007*	951 (125 - 3438)	10931 (8018 - 20969)	<0,001*
CRP, mg/l, $M \pm SD$	30 (15 - 59)	49 (15 - 89)	0,175	28 (14 - 57)	47 (18 - 91)	0,046*
Lactate, mmol/l, $M \pm SD$	3 (2-5)	5 (2-7)	0,507	3 (2-5)	4 (2-6)	0,984

\* n = 78, † - association of the outcome value with the predictor value is statistically significant ( $p < 0.05$ )

Figure 2. Patients' characteristics.

[Abstract:1762]

## A PROSPECTIVE ANALYSIS ACCORDING TO CHRONOTYPE OF CARDIOMETABOLIC PROFILE AND LIFESTYLE HABITS AMONG OBESE PATIENTS UNDERGOING BARIATRIC SURGERY

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**Background:** Recent studies point to altered circadian rhythms as a factor responsible for obesity.

**Objectives:** The aim of our study was to assess prior to the surgery lifestyle habits among obese patients undergoing bariatric surgery as well as their relationship with chronotype and the influence of this on weight loss after the surgery.

**Materials and Methods:** We performed a prospective study in 101 patients undergoing bariatric surgery at the Hospital Universitario Sofia (Cordoba, Spain). Anthropometric measures and biochemical parameters were determined prior to surgery. Lifestyle habits and chronotype were analysed. Finally, the evolution of weight after surgery was recorded.

**Results:** Evening patients had higher pre-surgery weight ( $p=0.04$ ) and body mass index (BMI) ( $p=0.03$ ) than the morning patients. Evening patients had worse lipid profile and higher insulin resistance ( $p=0.05$ ). In contrast, morning patients showed higher vigorous physical activity ( $p=0.02$ ) and higher adherence to the Mediterranean diet ( $p<0.01$ ) compared to evening patients. Finally, a lower percentage of weight loss and BMI was observed in patients with an evening chronotype compared to those with a morning chronotype ( $p=0.03$ ,  $p=0.04$  respectively) after the first two post-intervention check-ups (8-10 months after the surgery approximately).

**Conclusions:** Obese patients undergoing bariatric surgery with evening chronotype have worse cardiometabolic profile and lifestyle habits. In addition, the weight loss among obese evening patients after the bariatric surgery was lower compared to obese

morning patients. To assess the chronotype among obese patients undergoing bariatric surgery could allow us to provide tailored recommendations for a better evolution after the surgery.

**Keywords:** chronobiology, obesity, Mediterranean lifestyle, cardiometabolic risk

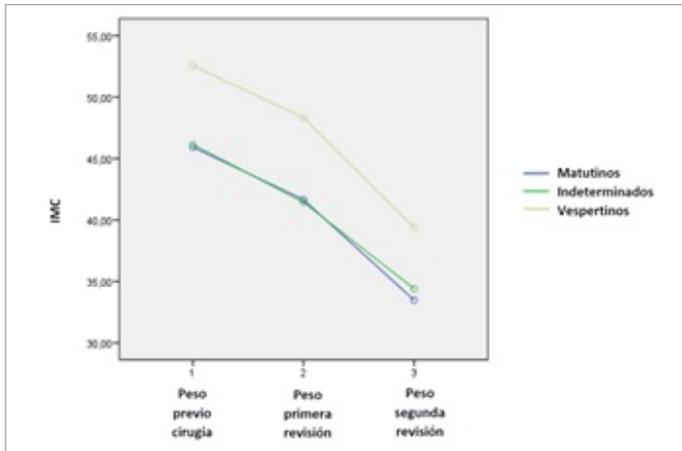


Figure 1. Evolution of mean body mass index at post-surgery revisions according to chronotype.

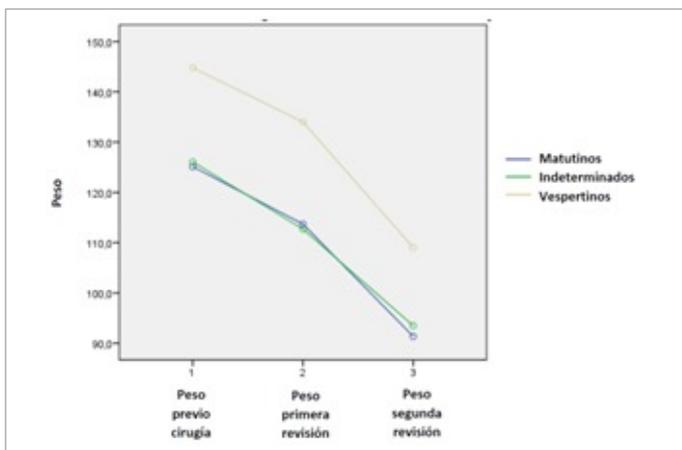


Figure 2. Evolution of mean weight at post-surgery revisions according to chronotype.

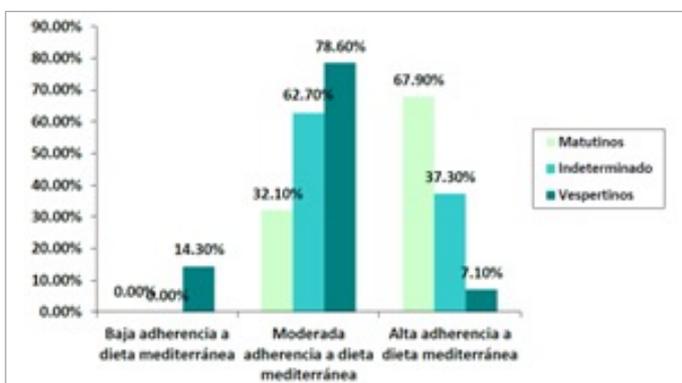


Figure 3. Percentage of patients according to the degree of adherence to the Mediterranean diet calculated with the MEDAS questionnaire according to chronotype.

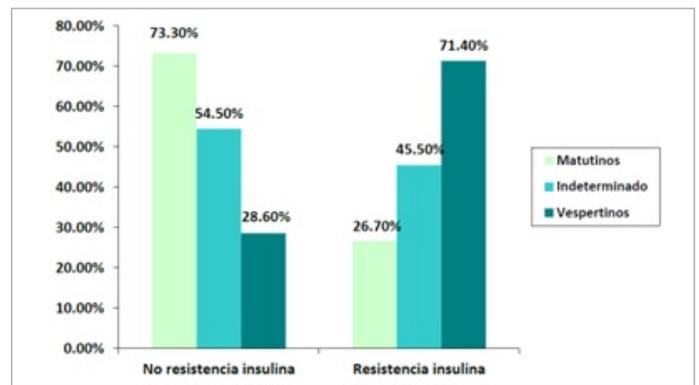


Figure 4. Percentage of patients with insulin resistance according to the HOMA-IR index as a function of chronotype.

	Total	Mornings	Indeterminate	Evenings	p value
Glucose	84.2 ± 18.7	85.5±15.4	83.1± 15.4	86.6±21.8	0.59
Insulin	17.2±23.4	12.8±9.3	20.6±31.7	16.5±11	0.79
HOMA-IR	3.7±7.1	2.6±2.2	4.6±9.9	3.3±2.1	0.69
Uric acid	6.9±2	6.4±1.6	7.1±2.2	7.2±1.8	0.33
Total cholesterol	156.1±35.3	155.5±35	157.5±36.2	151.4±34.6	0.85
HDL-cholesterol	38.2±9.9	40.9±11.6 a	38.4±8.7 a	31.6±7.7 b	0.02
LDL-cholesterol	94.5±30.6	92.8±33.4	95.6±30.4	93.9±27.1	0.92
Triglycerides	118.2±51.2	109±43.2	120.7±57.8	127±32.5	0.50
ApoA	102.4±18.2	106.1±19.5 a	103±17.7 a	92.5±14.8 b	0.05
ApoB	75.5±22.7	73±20.1	75.3±20.8	81.6±33.7	0.53

Table 1. Analysis of cardiometabolic analytical parameters prior to surgery according to chronotype represented as mean ± standard deviation.

	Total	Mornings	Indeterminates	Evenings	p value
Hours of sleep per week	8.3 ± 1.4	7.9 ± 1.2 a	8.5 ± 1.4 b	7.8 ± 1.4a	0.05
Weekly lunch time	14:44 ± 38'	14:40 ± 45'	14:47 ± 33'	14:43 ± 44'	0.73
Weekly dinner time	21:37 ± 45'	21:26 ± 52' a	21:38 ± 43' a	21:52 ± 40' b	0.26
Weekly bedtime	23:50 ± 79'	23:32 ± 84' a	23:41 ± 70' a	1:04 ± 66' b	0.01
Weekly bedtime	7:56 ± 86'	7:19 ± 74' a	8:05 ± 85' b	8:34 ± 91' b	0.01

Table 2. Average hours related to sleep and food according to chronotype.

	Total	Mornings	Indeterminates	Evenings	p value
Weekly vigorous activity	77.67 ± 15.67	127.5 ± 39.45 a	69.91 ± 18.40 b	10.71 ± 7.45b	0.02
Weekly moderate activity	108.76 ± 23.54	101.79 ± 40.54	97.54 ± 20.97	170 ± 123.72	0.58
Weekly light activity	346.70 ± 48.88	447.32 ± 139.85	308.36 ± 46.03	304.29 ± 115.84	0.46
Minutes per week seated	28884.7 ± 168.37	2585 ± 205.19	2867.59 ± 244.99	3555 ± 477.94	0.21
Total physical activity	693.88 ± 84.60	933.21 ± 208.35	933.21 ± 208.35	580.71 ± 224.12	0.21

Table 3. Mean ± standard error of weekly physical activity and sitting time expressed in minutes as a function of chronotype.

[Abstract:1768]

## HEART FAILURE WITH REDUCED EJECTION FRACTION IN A YOUNG WOMAN: LEFT VENTRICULAR NON-COMPACTION CARDIOMYOPATHY

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Noncompaction cardiomyopathy is a rare cardiomyopathy with abnormal trabeculations in the left ventricle. Complications may include heart failure, arrhythmias, sudden cardiac death, thromboembolic events.

A 38-year-old female patient came with complaints of weakness, difficulty in daily activities, shortness of breath for 4-months. Her parents are cousins, and her brother recently diagnosed with HF. Medical records showed that her troponin level was twice the upper limit since 2015, PRO-BNP: 10164 pg/ml. Echocardiography revealed increased LV wall thickness, EF:27%, noncompact areas on lateral-posterior walls of the LV, and a noncompact/compact myocardium ratio of 1.5 in diastole. Coronary CT-angiography showed normal vasculature, increased trabeculation in the left ventricle (ventricular noncompaction?). Cardiac MRI demonstrated global hypokinesia in left atrium, EF:19%, contrast retention in favour of subendocardial fibrosis in LV, and trabeculated/nontrabeculated segments ratio >3, in favour of marked noncompaction. A cardiomyopathy genetic panel was sent. Heterozygous c.836C>T(p.(Ser279Leu)) missense variant detected in BAG3 gene exon 3. BAG3 is known to protect against dilated cardiomyopathy by protecting cardiomyocytes. Although heterozygous mutations are associated with dilated cardiomyopathy-myofibrillar myopathy, this is a variant of unknown clinical significance (1,2).

Noncompaction diagnosis made by evaluating echocardiography with Jenni criteria or cardiac MRI with CMR criteria (4). In addition, at least one of these must be present: another family member with the same diagnosis, regional wall motion defect, noncompaction-related complication, or mutation previously proven to be associated with noncompaction.

### References

- 1 Liu et al. (2021) Heart Failure Reviews
- 2 Hershberger et al. Dilated Cardiomyopathy Overview
- 3 Jenni et al. (2001) Heart
- 4 Petersen et al. (2005) J Am Coll Cardiol

**Keywords:** noncompaction cardiomyopathy, heart failure with reduced ejection fraction, BAG3 gene

[Abstract:1785]

## VOLUME OVERLOAD ASSESSED BY BIOELECTRICAL IMPEDANCE ANALYSIS PREDICTS WORSENING HEART FAILURE EVENTS IN CHRONIC STABLE HEART FAILURE WITH REDUCED EJECTION FRACTION PATIENTS

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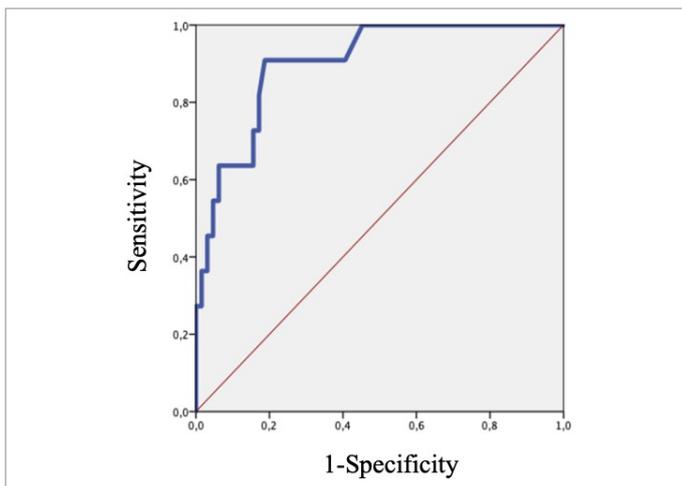
**Introduction and Objectives:** Heart failure (HF) with reduced left ventricular (LV) ejection fraction (EF) is a frequent entity with poor prognosis hallmarked by decompensations. Bioelectrical impedance analysis (BIA) might be useful to identify apparently stable patients with subclinical congestion before decompensation. The objective was to determine the usefulness of BIA predicting worsening HF (WHF) events, defined as visits to de emergency department or hospitalization for HF.

**Methods:** Consecutive outpatients with LVEF ≤40% without WHF events in the previous 6 months were prospectively included between September 2022 and April 2023. BIA, echocardiogram, blood tests and a physical examination were performed. Demographic, anthropometric, clinical, analytical and follow-up variables were collected.

**Results:** 76 patients were included. Table 1 summarizes baseline characteristics. Median volume overload (VO) (difference between measured weight and dry weight estimated by BIA) was 0.4 litres (L) (interquartile range 0-1.7L). Median follow-up was 80.5 days. 14.5% patients visited the emergency department (n = 4) or were hospitalized for HF (n = 7). Univariate binary logistic regression showed association between WHF and NT-proBNP, E/e', LVEF and VO. Multivariate analysis showed that VO was the only independent predictor of WHF (OR 4.68 95%CI 1.45-15.09). Assessment of predictive performance of VO for WHF with ROC analysis showed an area under the curve of 0.90 (95%CI 0.82-0.99) with an optimal 1.1L threshold (82% sensitivity and 91% specificity).

**Conclusions:** VO estimated by BIA was independently associated with WHF in stable outpatients with HF and reduced LVEF. The optimal cut-off was 1.1 L.

**Keywords:** chronic heart failure, reduced left ventricular ejection fraction, bioelectrical impedance analysis, volume overload, subclinical congestion, non-invasive



**Figure 1.** ROC curve analysis: volumen overload and worsening heart failure events.

Area under the curve 0.90 (95%CI 0.82-0.99).

Age, years	68.8 (60.2-76.5)
Male sex, n (%)	65 (85.5%)
Hypertension, n (%)	43 (56.6%)
Diabetes, n (%)	18 (23.7%)
Chronic kidney disease, n (%)	32 (42.1%)
$\beta$ -blockers, n (%)	70 (92.1%)
ACEi/ARB/ARNI, n (%)	64 (84.2%)
MRA, n (%)	50 (65.8%)
SGLT2i, n (%)	40 (52.6%)
Ischaemic cardiomyopathy, n (%)	47 (61.8%)
LV ejection fraction, %	32 (26.5-40)
NT-proBNP, pg/ml	736.5 (253-2035)
Congestion signs at physical examination, n (%)	13 (16.9%)
Volume overload, L	0.4 (0.0-1.7)
E/e' ratio	10.2 (7.3-14.4)

**Table 1.** Baseline characteristics.

Median (interquartile range); ACEi: angiotensin converter enzyme inhibitors; ARB angiotensin receptor blockers; ARNI: angiotensin receptor blocker/neprilysin inhibitors; MRA: mineralocorticoid receptor antagonists; SGLT2i: sodium-glucose cotransporter type 2 inhibitors. NT-proBNP: N-terminal pro B-type natriuretic peptide.

[Abstract:1802]

## RATIO OF WAIST CIRCUMFERENCE TO HEIGHT AMONG SMOKERS WITH MULTIMORBIDITIES IN THE PROCESS OF SMOKING CESSATION

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**Objectives:** To evaluate the associations between ratio of waist circumference to height (WCH) and smokers in the process of smoking cessation.

**Methods:** Cross-sectional cohort study of smokers from the "Tobacco Free Project", between 09/2021 and 12/2023. Abnormal values were considered WCH  $\geq 0.05$ ; abdominal obesity, waist circumference  $>80$  cm (women) and  $>94$  cm (men); systolic blood pressure (SBP)  $>130$  mmHg. Obstructive sleep apnea syndrome (OSAS), stop bang survey  $>5$  points; depression, PHQ-9  $\geq 9$  points; cognitive impairment, Montreal cognitive assessment (Moca)  $<26$  points; cholesterol  $>200$  mg/dL; triglycerides  $>150$  mg/dL; declared atherosclerotic disease (DAD), atherosclerotic lesion, regardless of the affected site.

**Results:** 158 smokers were evaluated (22 consecutive treatment groups), of which 81.8% were women; age,  $57.76 \pm 9.98$  years; 53.5%, white; 38.3%, married. Regarding smoking history: length of addiction,  $40.12 \pm 12.00$  years; 60.7%, smoking  $\geq 20$  cigarettes/day; 73.2%, high nicotine dependence. When comparing smokers with abnormal WCH (74.2%) with those without this characteristic, it was observed that they were significantly more obese ( $p < 0.005$ ); with a higher prevalence of dyslipidaemia ( $p < 0.002$ ), with a predominance of higher levels of cholesterol ( $p < 0.050$ ) and triglycerides ( $p < 0.003$ ); diabetes mellitus ( $p < 0.020$ ); OSAS ( $p < 0.046$ ) and higher SBP levels ( $p < 0.037$ ). There was a tendency towards significance for greater cognitive deficit ( $p < 0.067$ ), as well as for triggers of nicotine dependence ( $p < 0.067$ ) and behaviours ( $p < 0.061$ ).

**Conclusions:** Abnormal WCH was common in the studied population and was associated with metabolic indicators, where smoking per se may have been a factor that potentiates these findings.

**Keywords:** abdominal obesity, waist circumference to height ratio, smoking, smoking cessation

[Abstract:1805]

## THE NUMBER OF RISK FACTORS NOT AT TARGET IS ASSOCIATED WITH CARDIOVASCULAR RISK IN A TYPE 2 DIABETIC POPULATION WITH ALBUMINURIA IN PRIMARY CARDIOVASCULAR PREVENTION. POST-HOC ANALYSIS OF THE NID-2 TRIAL

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**Background:** Nephropathy in Diabetes type 2 (NID-2) study is an open-label cluster randomized clinical trial that demonstrated that multifactorial intensive treatment reduces major adverse cardiac events (MACEs) and overall mortality versus standard of care in type 2 diabetic subjects with albuminuria and no history of cardiovascular disease. Aim of the present post-hoc analysis of NID-2 study is to evaluate whether the number of risk factors on target associates with patient outcomes.

**Methods:** Intervention phase lasted four years and subsequent follow up for survival lasted 10 years. To the aim of this post-hoc analysis, the whole population has been divided into 3 risk groups: 0-1 risk factor (absent/low); 2-3 risk factors (intermediate); 4 risk factors (high). Primary endpoint was a composite of fatal and non-fatal MACEs, the secondary endpoint was all-cause death at the end of the follow-up phase.

**Results:** Absent/low risk group included 166 patients (52.4%), intermediate risk group 128 (40.4%) and high-risk group 23 (7.3%). Cox model showed a significant higher risk of MACE and death in the high-risk group after adjustment for confounding variables, including treatment arm (HR 1.91, 95% CI 1.04-3.52,  $P = 0.038$  and 1.96, 95%CI 1.02-3.8,  $P = 0.045$ , respectively, vs absent/low risk group).

**Conclusions:** This post-hoc analysis of the NID-2 trial indicates that the increase in the number of risk factors at target correlates with better cardiovascular-free survival in patients with type 2 diabetes at high CV risk.

**Keywords:** cardiovascular risk, diabetes, albuminuria, RCT

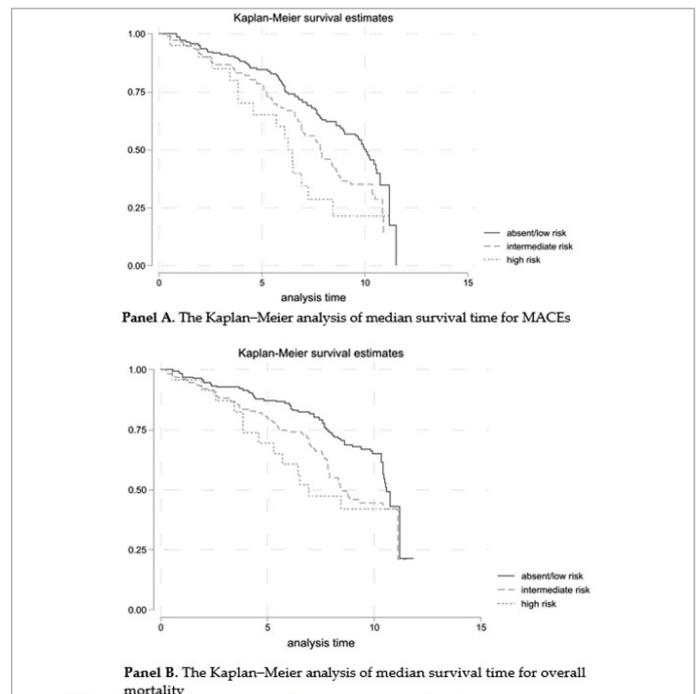


Figure 1. Kaplan-Meier analysis of median survival time for MACEs (Panel A) and overall mortality (Panel B).

Number of risk factors	Risk groups				
	Absent/low 0	1	Intermediate 2	3	High 4
Patients (number)	62	104	82	46	23
Type of risk factor					
SBP $\geq$ 130 mmHg (n, %)	0 (0.0%)	12 (11.5%)	30 (36.6%)	39 (84.8%)	23 (100.0%)
DBP $\geq$ 80 mmHg (n, %)	0 (0.0%)	6 (5.8%)	14 (17.1%)	25 (54.3%)	23 (100.0%)
HbA1c $\geq$ 7% (n, %)	0 (0.0%)	22 (21.2%)	54 (65.9%)	34 (73.9%)	23 (100.0%)
LDL $\geq$ 100 mg/dL (n, %)	0 (0.0%)	64 (61.5%)	66 (80.5%)	40 (87.0%)	23 (100.0%)

SBP systolic blood pressure, DBP diastolic blood pressure

Table 1. Distribution of risk factors in the three risk groups.

	Overall	Groups			P
		Absent/low risk	Intermediate risk	High risk	
N	368	166	128	23	
Age (years)	70.4 $\pm$ 9.2	69.7 $\pm$ 9.8	71.7 $\pm$ 8.2	70.0 $\pm$ 11.7	0.43
Males (n, %)	173 (47%)	80 (42.8%)	54 (42.2%)	12 (52.2%)	0.49
SBP (mmHg)	130.9 $\pm$ 12.8	125.4 $\pm$ 7.3	135.3 $\pm$ 13.7	148.3 $\pm$ 11.5	<0.001
DBP (mmHg)	78.4 $\pm$ 7.3	76.5 $\pm$ 5.2	79.2 $\pm$ 7.8	91.1 $\pm$ 5.0	<0.001
Serum creatinine (mg/dL)	1.2 $\pm$ 0.6	1.2 $\pm$ 0.6	1.3 $\pm$ 0.7	1.3 $\pm$ 0.4	0.13
eGFR (mL/min/1.73m <sup>2</sup> )	60.5 $\pm$ 22.7	63.3 $\pm$ 22.4	56.7 $\pm$ 22.9	36.4 $\pm$ 19.3	0.033
Albuminuria (mg/day)	80 (26-180)	100 (30-190)	40 (18-150)	94 (60-230)	0.033
Hemoglobin (g/dL)	12.9 $\pm$ 1.6	12.9 $\pm$ 1.5	12.6 $\pm$ 1.8	13.2 $\pm$ 1.5	0.13
Glycaemia (mg/dL)	150.2 $\pm$ 42.0	139.4 $\pm$ 27.6	157.9 $\pm$ 42.9	169.4 $\pm$ 59.4	<0.001
HbA1c (%)	7.2 $\pm$ 0.9	6.8 $\pm$ 0.6	7.4 $\pm$ 0.9	8.1 $\pm$ 0.8	<0.001
Total cholesterol (mg/dL)	181.1 $\pm$ 32.1	166.6 $\pm$ 24.5	193.8 $\pm$ 30.6	222.0 $\pm$ 24.7	<0.001
HDL-cholesterol (mg/dL)	44.4 $\pm$ 12.8	43.9 $\pm$ 9.8	44.9 $\pm$ 15.9	41.7 $\pm$ 7.2	0.50
LDL-cholesterol (mg/dL)	110.4 $\pm$ 30.1	98.3 $\pm$ 25.9	119.7 $\pm$ 27.6	147.6 $\pm$ 21.5	<0.001
Triglycerides (mg/dL)	143.4 $\pm$ 58.1	135.2 $\pm$ 50.0	146.3 $\pm$ 59.7	163.3 $\pm$ 42.5	0.030
Therapeutic goals					
SBP < 130 mmHg (n, %)	234 (67.2%)	154 (92.8%)	59 (46.1%)	0 (0.0%)	-
DBP < 80 mmHg (n, %)	276 (79.3%)	160 (96.4%)	89 (69.5%)	0 (0.0%)	-
HbA1c < 7% (n, %)	203 (56.9%)	144 (86.7%)	40 (31.3%)	0 (0.0%)	-
LDL < 100 mg/dL (n, %)	131 (39.6%)	102 (61.4%)	22 (17.2%)	0 (0.0%)	-
Treatment arm*					<0.001
MT	199 (54.1%)	116 (58.3%)	51 (25.6%)	2 (1.0%)	
SoC	169 (45.9%)	50 (29.6%)	77 (45.6%)	21 (12.4%)	

Data are mean  $\pm$  SD or median and [IQR]. Comparisons are evaluated using ANOVA procedure or Kruskal-Wallis test, respectively for continuous variables with normal or skewed distribution, or Pearson's chi-squared for categorical data.  
SBP systolic blood pressure, DBP diastolic blood pressure, eGFR glomerular filtration rate estimated by CKD-EPI formula, MT multifactorial intensive treatment, SoC standard of care.  
\*distribution of different risk groups among the study arms is presented as row relative frequency

Table 2. Overall patient's characteristics at the end of interventional phase.

Risk factor group	MACEs						All-cause mortality					
	Model 1			Model 2			Model 1			Model 2		
	HR	95%CI	p	HR	95%CI	p	HR	95%CI	p	HR	95%CI	p
Absent/Low	Reference	–	–	Reference	–	–	Reference	–	–	Reference	–	–
Intermediate	1.53	1.10–2.13	0.011	1.32	0.92–1.9	0.13	1.58	1.11–2.25	0.011	1.47	0.99–2.16	0.054
High	2.4	1.37–4.21	0.002	1.91	1.04–3.52	0.038	1.87	1.03–3.4	0.04	1.96	1.02–3.8	0.045

Model 1 unadjusted  
Model 2 adjusted for age and treatment arm  
HR hazard ratio, CI confidence intervals

**Table 3.** Risks for MACEs and all-cause mortality in the three risk groups at univariate Cox model and after adjustment for confounding variables.

MACE	MACE				All-cause mortality			
	HR (95%CI)	Survival probability in high risk group	NNT (95%CI)	Patients still at risk (N)	HR (95%CI)	Survival probability in high risk group	NNT (95%CI)	Patients still at risk (N)
vs Absent/Low	0.5 (0.28–0.96)	0.29	4.3 (3.0–69.6)	151	0.5 (0.26–0.98)	0.47	4.7 (2.3–137.9)	197
vs intermediate	0.7 (0.39–1.22)	0.29	7.4 (3.7–13.9)	151	0.75 (0.40–0.98)	0.47	10.3 (3.1–137.9)	197

**Table 4.** Number Needed to Treat (NNT) calculated using the hazard ratios (HR) and the survival probability in the high risk group at the time-point of 7.5 yr.

[Abstract:1831]

## START OF TREATMENT WITH SODIUM-GLUCOSE CO-TRANSPORTER-2 (SGLT-2) INHIBITORS AND PROGRESSION OF CHRONIC KIDNEY DISEASE IN PATIENTS HOSPITALIZED FOR HEART FAILURE (HF): OUR COHORT

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**Background and Aims:** To evaluate progression of chronic kidney disease in patients who started on treatment with empaglifozin, SGLT-2 inhibitor, during admission for HF decompensation, and their clinical-epidemiological characteristics.

**Materials and Methods:** Longitudinal descriptive observational study in patients admitted for decompensated HF to our hospital during 2022 who were started on treatment with empaglifozin during admission. Clinical-epidemiological data were obtained from the medical history. Data analysis was performed with the SPSSv25 program.

**Results:** 151 patients were included (62.3% male). The mean age was 73 years. The Charlson index was high (6.54). 49.7% of admissions were in Internal Medicine, 47.7% in cardiology and 2% in nephrology. 68.2% of patients had a history of HF, and 84.1% were diabetic. 43% had been admitted at least once in the previous year, and 44.37% were taking diuretics. The mean glomerular filtration rate (GFR) was 59.6ml/min/1.73m<sup>2</sup>.

Starting dose of empaglifozin was 10 mg in 74.8%. Treatment was suspended in 7.9% at 6 months. The distribution of the percentage of GFR variation in the following 6 months was normal, with a mean of 4.37(±22.9) ml/min/1.73m<sup>2</sup>. The average value of GFR 57.51 ml/min/1.73m<sup>2</sup>. 34.4% had readmission and the mortality rate from any cause was 11.9%.

**Conclusions:** According to our results, consistent with other studies in the literature, the start of early treatment with empaglifozin during admission for decompensated HF doesn't produce a significant deterioration of the kidney disease in the following months, observing a decrease in the rate of readmission for any cause, despite the great comorbidity of our patients.

**Keywords:** heart failure, SGLT-2 inhibitors, kidney disease

[Abstract:1835]

## BRADYCARDIA INDUCED BY CORTICOSTEROID BOLUSES: NOT A SELDOM INCIDENT

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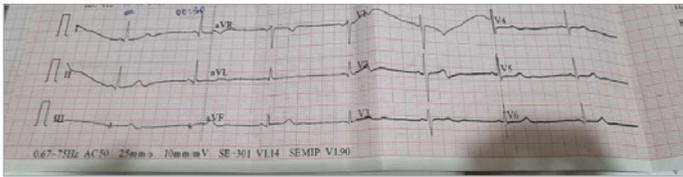
**Introduction:** Corticosteroids constitute a therapeutic weapon in many systemic diseases. Although these medications are often lifesaving, the use of intravenous bolus is not without risk. The incidence of paradoxal hemodynamic and cardiac complications is estimated at 6–12%. We report the case of a patient who presented bradycardia following a high-dose cortico-therapy.

**Case:** 36 years-old woman followed for systemic lupus erythematosus associated with antiphospholipid syndrome, admitted for management of a 4<sup>th</sup> lupus nephritis flare, treated with bolus of methylprednisolone 1g/d for 3 days. The physical examination found: a month history of asthenia. Cardiovascular auscultation found a normal heart rate (HR) at 77 beats/min, BP was estimated at 110/70 mmHg with an EKG without abnormalities. Following the 3<sup>rd</sup> bolus, the patient presented bradycardia at 46 beats/min which persisted for 24 hours despite the administration of atropine, without a drop in blood pressure. A continuous EKG showed sinus bradycardia with a discreet irregularity varying between 44–49 beats/min associated with a short PR (0.11) without signs of lower ischemia or repolarization disorders.

The biological parameters were correct: ionogram, D-dimer and cardiac enzymes. The patient was placed at rest with continuous clinical and electrical monitoring. HR normalized spontaneously on the 5<sup>th</sup> day.

**Conclusions:** Cardiac complications, notably bradycardia, are rarely observed during corticosteroid boluses but could be deadly. Therefore, it's necessary to be vigilant during this treatment, particularly in fragile patients.

**Keywords:** bradycardia, corticosteroid, boluses



**Figure 1.** EKG. Sinus bradycardia 45 beats/min with a discreet irregularity associated with a short PR (0.11) without signs of lower ischemia or repolarization disorders.

[Abstract:1870]

## A CASE OF INFECTIVE ENDOCARDITIS PRESENTING WITH CONFUSION

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Infective endocarditis (IE) is an infection of the endocardial surface of the heart and is a rare but mortal disease.

A 21-year-old male patient with no history of chronic disease presented to the emergency department with a complaint of fever for 15 days. On physical examination, his general condition was poor, he was prone to sleep. Brain MRI was performed due to confusion and interpreted as tuberculosis encephalitis and tuberculoma in the differential diagnosis. The patient hospitalised to the intensive care unit (ICU) with a preliminary diagnosis of tuberculous meningitis, was intubated with hemodynamic instability and low score of Glasgow coma scale (GCS). In the follow-up, hypertension, acute renal failure, and elevated liver function tests were observed. The patient was consulted with infectious diseases, and antituberculosis treatment was initiated. Cerebrospinal fluid (CSF) sample was collected from the patient. In the condition of sepsis, the clinical status of the patient with resistant fever was not compatible with tuberculous meningitis and *Staphylococcus aureus* growth in the blood culture, so he was started to be investigated for IE. Transthoracic echocardiography revealed a bicuspid aorta. The patient had Janeway lesions on the sole of the foot. Brain MRI re-evaluated by neuroradiology and was interpreted as diffuse ischemic areas, secondary pyogenic and haemorrhagic abscesses. The patient, whose antibiotherapy was re-arranged, was taken to emergency operation by the cardiovascular surgeon and aortic valve replacement was performed. In the follow-up of the patient who was treated with antioedema therapy, his neurological deficits regressed considerably and the patient was transferred to the neurology service.

**Keywords:** fever, confusion, infective endocarditis

[Abstract:1887]

## SOMATOSTATIN RECEPTOR TYPE 2 AS POTENTIAL MARKER OF LOCAL MYOCARDIAL POST-INFARCTION INFLAMMATION: MORPHOLOGICAL DATA ON DISTRIBUTION AND DYNAMICS

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**Summary:** Somatostatin receptor type 2 (SSTR2), which can be detected using <sup>99m</sup>Tc-EDDA/HYNIC-TOC SPECT/CT imaging, is a potential marker for non-invasive monitoring of local post-MI inflammation. SSTR2 is found at inflammation sites without accumulating in intact myocardium. To reveal processes underlying scintigraphic imaging, we need to identify cells expressing SSTR2 and their localization in the infarcted myocardium.

**Purpose:** To explore distribution and dynamics of SSTR2+ cells in the myocardium of patients with myocardial infarction (MI).

**Methods:** Post-mortem myocardial tissue samples were collected in different MI phases: inflammatory, 1–4 days (n=3); early proliferative, 5–14 days (n=3); late proliferative, 3–8 weeks (n=2). Immunohistochemical staining was performed using anti-SSTR2 antibody (UMB-1; Abcam).

We have defined the following MI-zones: infarct core (IC) – necrotic myocardium; border zone – intact myocardium next to the IC; remote zone – intact myocardium, most distant from the IC; peri-scar zone – the border area between intact cardiomyocytes and the scar/mature granulation tissue.

We counted the number of SSTR2+vessels (pericytes), SSTR2+neutrophils, and SSTR2+macrophages/monocytes in 10 fields of view (size 600 x 400 μm), magnification x 400.

**Results:** The results are presented in appendices.

**Conclusions:** SSTR2-positive staining was detected in neutrophils, monocytes, macrophages, pericytes, single endothelial and epicardial mesothelial cells.

In all MI phases, the IC demonstrated the largest number of SSTR2+cells with neutrophils predominating in the inflammatory phase, neutrophils and macrophages/monocytes – in the early proliferative phase, macrophages and pericytes – in the late proliferative phase. The physiological meaning of a positive SSTR2-targeted scintigraphic signal may vary depending on the MI phase.

**Keywords:** SSTR2, MI, inflammation, macrophages, pericytes, SPECT

	SSTR2+ Ma/Mo	SSTR2+ Nph	SSTR2+ Ves
<b>Inflammatory phase</b>			
Infarct core	6.4	161.8	0
Border zone	0.9	10.7	0
Remote zone	0	0.6	0
<b>Early proliferative phase</b>			
Infarct core	5.6	65.1	0.1
Border zone	0.8	1.2	0.2
Remote zone	0.3	0.5	0.1
<b>Late proliferative phase</b>			
Peri-scar zone	1.8	0.7	3.3

Table 1. Results.

Ma/Mo - macrophages/monocytes; Nph - neutrophils; Ves - vessels. Numbers for Ma/Mo and Nph are given as cells/field of view; numbers for VES are given as vessel/field of view.

[Abstract:1888]

## PREOPERATIVE CLINICAL AND LABORATORY INDICATORS IN KIDNEY TRANSPLANT RECIPIENTS WITH ADVERSE CARDIOVASCULAR EVENTS

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**Background:** Kidney transplantation is the most cardioprotective method of renal replacement therapy, nevertheless cardiovascular diseases are one of the main causes of hospitalization and mortality in recipients.

The purpose is to study the preoperative features of clinical and laboratory parameters of kidney transplant recipients who had adverse cardiovascular events in the postoperative period.

**Methods:** We examined 43 kidney transplant recipients during the study. The main group consisted of 16 (37.2%) patients who had adverse cardiovascular events within five years after transplantation. The comparison group included recipients without cardiovascular complications. The study groups were comparable in terms of gender, age, and traditional cardiovascular risk factors.

**Findings:** The incidence of overweight and obesity in the study groups was comparable. Body mass index in the preoperative period was higher in recipients with adverse cardiovascular events than in recipients without them –  $26.4 \pm 3.7$  kg/m<sup>2</sup> versus  $23.6 \pm 4.1$  kg/m<sup>2</sup>,  $p < 0.05$ . Blood levels of total cholesterol, triglycerides and low-density lipoproteins did not differ significantly between the study groups. High-density lipoproteins blood level in recipients with cardiovascular events was lower –  $1.31 \pm 0.36$  mmol/L versus  $1.67 \pm 0.62$  mmol/L,  $p < 0.05$ . With comparable indicators of red blood cells and haemoglobin concentration an increased erythropoietin blood level was more often diagnosed in recipients with subsequent adverse cardiovascular events – 50.0% (n=8) versus 18.5% (n=5),  $p < 0.05$ .

**Conclusions:** The preoperative period of recipients with

adverse cardiovascular events after kidney transplantation was characterized by a higher body mass index, lower blood levels of high-density lipoproteins and a higher incidence of hypererythropoietinemia than in recipients without cardiovascular complications.

**Keywords:** cardiovascular events, kidney transplant recipients, CKD

[Abstract:1947]

## A HYPOCOAGULATION DILEMMA

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A 47-year-old woman, smoker, with abnormal uterine haemorrhage secondary to myomatosis, with non-compliance gynaecology follow-up and need for goserelin treatment, went to the emergency room with one-day evolution oedema of the left lower limb (LL), after a fall in the previous month followed by greater immobilization. On observation, hemodynamically stable, pale, polypneic, with a palpable hypogastric mass up to the umbilical scar and oedema of the left LL.

Complementary study showed arterial blood gas analysis (FiO<sub>2</sub> 21%) without respiratory insufficiency; haemoglobin 4.5g/dL, mean corpuscular volume 60 fL, D-dimers 10.11 mg/L; SARS-CoV-2 RT-PCR positive; thoracoabdominopelvic angio-CT revealed: bilateral pulmonary thromboembolism; thrombosis of the left femoral, external, internal and common iliac veins; massive uterine lesions in the myometrium with uterus measuring 24 x 20 x 11 cm.

Admitted to the ward with pulmonary thromboembolism, left deep vein thrombosis, mild COVID-19 disease and iron deficiency anaemia with severe worsening due to active abnormal uterine haemorrhage. It was started hypocoagulation at a therapeutic dose and red blood cell transfusions with good response (Hb 6.5g/dL).

The echocardiogram and venous echo Doppler of the LL were normal, thrombophilia study was negative.

Gynaecology decided that no additional intervention was necessary given the hemodynamic stability and previously controlled blood loss, recommending the resumption of goserelin. This case highlights the difficulty to initiate hypocoagulation while active bleeding occurs – on one side the presence of active haemorrhage with haemoglobin reperfusion needing red blood cell transfusions, and on the other side two thrombotic events, being smoking, COVID-19 and immobilization the predisposing factors to thrombosis.

**Keywords:** pulmonary thromboembolism, abnormal uterine bleeding, hypocoagulation

[Abstract:1966]

## CLINICAL AND INSTRUMENTAL CHARACTERISTICS OF PATIENTS WITH A COMBINATION OF OBSTRUCTIVE SLEEP APNEA AND PAROXYSMAL ATRIAL FIBRILLATION IN DIFFERENT TACTICS OF TREATMENT OF ARRHYTHMIA

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**Materials and Methods:** 362 patients with paroxysmal atrial fibrillation (AF) were examined. Group 1 (n=115) – patients with AF on antiarrhythmic therapy, group 2 (n=247) – patients with AF after catheter ablation.

**Results:** patients from group 2 were younger than patients from group 1 (60 [53-65] and 67 [58.5-70] years,  $p<0.001$ ). In the structure of the group 1 patients with moderate and severe obstructive sleep apnoea (OSA) prevailed (31.8% and 38.2%), in the group 2 patients without sleep apnoea were more common (42.5%).

In the group 1 patients with arterial hypertension ( $p=0.002$ ), coronary heart disease, diabetes mellitus and obesity ( $p<0.001$ ) were more common, patients received 2 drugs more ( $p<0.001$ ). We found correlation ( $r_s=0.35$ ;  $p<0.001$ ) between OSA severity and body mass index (BMI). With an increase in BMI by 1 kg/m<sup>2</sup> an increase in the apnoea-hypopnea index by 0.64 should be expected.

The area under the ROC-curve corresponding to the relationship between the prognosis of severe OSA and BMI was  $0.652\pm 0.036$ , 95%CI: 0.582-0.723,  $p<0.001$ . Patients with paroxysmal AF and BMI  $\geq 31$  kg/m<sup>2</sup> had a high risk of developing severe OSA. A correlation was found between the severity of apnoea and the size of the left atrium (LA) ( $r=0.28$ ;  $p<0.001$ ).

**Conclusions:** A high comorbidity and a greater drug load were found in the group 1. In patients with paroxysmal AF and obesity 1 grade was predicted a high risk of developing clinically significant OSA. There was an association between an increase the size of the LA and the severity of OSA.

**Keywords:** atrial fibrillation, obstructive sleep apnoea, obesity

[Abstract:1968]

## ECOCARDIOGRAPHIC PREDICTORS OF ATRIAL FIBRILLATION DEVELOPMENT IN PATIENTS WITH CRYPTOGENIC STROKE AND PROLONGED MONITORING USING INSERTABLE HOLTER

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**Objectives:** Cryptogenic strokes or those of unknown cause represent 25% of ischemic strokes and pose a challenge in identifying the aetiology of the vascular event. A percentage of these strokes are due to hidden paroxysmal atrial fibrillation. Detecting it implies a therapeutic change, necessitating anticoagulation in these patients. There are several echocardiographic markers that may raise suspicion of hidden atrial fibrillation.

**Materials and Methods:** We retrospectively studied patients with cryptogenic stroke who underwent implantation of a subcutaneous Holter monitor from October 2017 to March 2023 at our center.

**Results:** 101 devices were implanted (mean age  $73.5 \pm 11.9$  years, 40.4% female; 22.2% TIA) with a mean follow-up of  $656.2 \pm 331.0$  days. 66 patients showed left atrial dilation measured by indexed atrial volume (36 mild, 21 moderate, and 7 severe). Atrial strain was measured in 13 patients (5 of them had altered atrial function). All patients had an EF  $>40\%$ , and no spontaneous contrast phenomenon was observed in any case. 55 patients (54.4%) developed atrial fibrillation during follow-up. 52.7% of patients with mild atrial dilation, 86.3% with moderate dilation, and 100% with severe dilation developed fibrillation. Moderate-severe left atrial dilation was significantly associated with the development of atrial fibrillation ( $p<0.001$ ).

**Conclusions:** The presence of moderate-severe left atrial dilation in patients with cryptogenic stroke might indicate hidden atrial fibrillation, warranting prolonged monitoring if no other origin is found. Altered strain or moderate-severe ventricular hypertrophy, though not statistically significant in our study, could potentially increase the likelihood of developing atrial fibrillation.

**Keywords:** atrial fibrillation, subcutaneous Holter, cryptogenic stroke, echocardiographic predictors

[Abstract:1989]

**SUSPECTED HEART FAILURE**

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A 51-year-old man was admitted to the emergency room for quickly progressive dyspnoea of 3 days of evolution, until becoming resting, as well as oedema of the lower limbs. He had type 2 diabetes mellitus, arterial hypertension and chronic myeloid leukaemia. He was treated with enalapril 20 mg/24 hours, metformin 850 mg/24 hours and dasatinib 100 mg/24 hours.

On examination, we observed that he had hypoventilation in both pulmonary bases, heart rhythmic at 95 bpm, oxygen saturation 91%, respiratory rate oxygen saturation 91%, respiratory rate 22 rpm. Bilateral malleolar and pretibial oedema. Chest X-ray was performed, showing bilateral pleural effusion (PD), bronchial wall thickening and bilateral interstitial pattern. In the analysis, pro-BNP 500 pg/ml. He started treatment with furosemide 20 mg/8 hours, with little clinical improvement.

Due to clinical findings and complementary tests, we considered the following differential diagnoses: haemothorax due to contusion or platelet dysfunction in a patient with CML, drug-induced pleural effusion, congestive heart failure, parapneumonic effusion or extramedullary disease associated with CML. The absence of data of infection at the time of diagnosis of pleural effusion made us rule out paraneoplastic PD. As she had a non-displaced fracture, there was a low probability that the PD was haemothorax.

Since the patient had bilateral PD, with no response to diuretics, and a discreetly elevated proBNP, it was considered to be an exudate of pharmacological cause.

Dasatinib treatment was discontinued, with good clinical response and successive chest X-rays showed the disappearance of PD.

**Keywords:** pleural effusion, dasanitib, oedema

[Abstract:1993]

**PREVALENCE OF CARDIOVASCULAR RISK FACTORS AND HEART FAILURE IN PATIENTS ADMITTED FOR SURGERY**

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We studied a cohort of patients admitted to urology, otorhinolaryngology, traumatology, and general surgery Unit who consulted with Internal Medicine throughout their hospital stay. The aim of our study was to analyse how many patients had cardiovascular risk factors and how many had suffered a decompensation of their heart failure.

**Methods:** From August 13, 2023, to November 1, 2023, there were 44 patients requiring assessment by Internal Medicine. We

collected in a database how many had cardiovascular risk factors and how many had suffered decompensated heart failure.

**Results:** The median age was 76.5 years. Fifty percent were between 60 and 80 years old and the other half were over 80 years old. Regarding the analysis of cardiovascular risk factors, 88.63% had high blood pressure, 70.45% had dyslipidaemia and 34.09% had type 2 diabetes mellitus. Heart failure was the reason for consultation of Internal Medicine in 20.45% of patients.

**Conclusions:** Heart failure is highly prevalent (10% in the elderly), causes high morbidity and mortality and is the leading cause of hospital admission in the elderly. In patients who have undergone recent surgery the prevalence is even higher, probably due in part to intensive fluid therapy.

**Keywords:** surgery, elderly, heart failure

[Abstract:2019]

**TMA TO TMAO OXIDATION IN CORONARY HEART DISEASE PATIENTS IS SEX-DEPENDENT: FROM THE CORDIOPREV STUDY**

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**Summary and Purpose:** Cardiovascular disease (CVD) is more prevalent in men than women, but the mechanisms responsible for this are not fully understood. We aimed to evaluate differences in trimethylamine (TMA), a microbial metabolite and its oxidized form, trimethylamine N-oxide (TMAO), suggested to promote atherosclerosis, between men and women with coronary heart disease (CHD), using as a reference a non-CVD population.

**Methods:** This study was conducted in the framework of the CORDIOPREV study (NCT00924937), a clinical trial which included 837 men and 165 women with CHD. We used a non-CVD population of 375 individuals (270 men and 105 women). Plasma TMA and TMAO were measured by HPLC-MS/MS. The carotid study was ultrasonically assessed bilaterally by the quantification of intima-media thickness of both common carotid arteries (IMT-CC).

**Findings:** We found higher TMAO levels and TMAO/TMA ratio was higher in CHD men than CHD women (P=0.034 and P=0.026, respectively). No TMA sex-differences were found in CHD patients. The TMA and TMAO levels and TMAO/TMA ratio were lower, and no differences between sexes were found in the non-CVD population. TMAO levels in CHD patients were consistent with higher IMT-CC and more carotid plaques (P=0.032 and P=0.037, respectively) and lower cholesterol efflux in CHD men than CHD women (P < 0.001).

**Conclusions:** Our results suggest that CHD men have augmented TMAO levels compared with CHD women, presumably as

consequence of higher rate of TMA to TMAO oxidation, which can be associated with CVD, as these sex differences are not observed in a non-CVD population.

**Keywords:** gut microbiota, dysbiosis, sexual dimorphism, cardiovascular diseases, CORDIOPREV

[Abstract:2022]

## GAME OF «GO» WITH SYSTEMIC INFLAMMATION: WILL WE BE ABLE TO ENSURE ADEQUATE CONTROL OF CARDIOVASCULAR RISK IN THE CONTEXT OF INFLAMMATORY BOWEL DISEASE?

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**Purpose:** To study the prevalence of subclinical markers of cardiovascular morbidity/mortality and cardiovascular disease in patients with inflammatory bowel disease, to determine the frequency of carriage of the allelic polymorphic variant of the NOD2/CARD15 gene (3020 insC rs5743293), and to assess the presence of associations.

**Methods:** The multicentre study included 105 patients with inflammatory bowel disease, with any disease history and baseline therapy (age 43.5 [IQR, 33.0- 55.0] years). The following were performed: study of medical records, echocardiography, assessment of cardiac ankle vascular index, ECG Holter monitoring, daily blood pressure monitoring, treadmill test, determination of polymorphisms by allele-specific polymerase chain reaction (in 62 patients).

**Findings:** Arterial hypertension was diagnosed in 39% of patients (the prevalence of arterial hypertension among 25-64 year olds in the region is 45.9%), coronary heart disease in 8.6%, and atrial fibrillation in 3 patients. Diastolic dysfunction was detected in every fourth patient (25.7%). Left ventricular myocardial hypertrophy in 11.4%. The calculated vascular age was less than the passport age in 37.1% of patients and exceeded the passport age in 26.6%. An association of arterial hypertension with the 3020insC polymorphism in the CARD15(NOD2) gene rs5743293 was found (Chi-square 4.65;  $p = 0.031$ ).

**Conclusions:** A statistically significant association of arterial hypertension with the 3020insC polymorphism in the CARD15(NOD2) gene rs5743293 was found. The prevalence rates of arterial hypertension in patients with inflammatory bowel disease do not exceed the values obtained in the epidemiological study MERIDIAN-RO in the region.

**Keywords:** systemic inflammation, inflammatory bowel disease, cardiovascular prevention

[Abstract:2030]

## DIFFERENCES OF CARDIOVASCULAR HEALTH ACCORDING TO SEX AMONG VULNERABLE POPULATION AT RISK OF FOOD INSECURITY FROM E-DUCASS STUDY

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**Background:** The increase of cardiovascular diseases is an important global health problem, closely related to lifestyle habits and food insecurity. The objective of this study was to evaluate differences in cardiovascular health according to sex in a vulnerable population at risk of food insecurity.

**Methods:** This is a cross-sectional study in the population at baseline (12-80 years,  $n=460$ ) from the e-ducass study (NCT05379842), a health educational clinical trial. Participants filled out questionnaires and anthropometric measures, blood pressure and blood samples were obtained. The cardiovascular health was determined by Life's Simple 7 and Life's Essential 8.

**Results:** At baseline, we observed that Life's Simple 7 score in men was 3.18 while in women was 3.39 ( $p= 0.09$ ), and the Life's Essential 8 score was 63.59 in men and 65.96 in women ( $p=0.06$ ). When we observed the different parameters, differences were found according to sex only for glucose (1.52 men, 1.64  $p= 0.03$ ) in Life's Simple 7 score. Similarly, differences were showed in the glucose score (80.85 men, 85.25 women  $p= 0.04$ ) and blood pressure (66.30 men, 73.51 women  $p= 0.03$ ) in Life's Essential 8.

**Conclusions:** The e-ducass program aims to offer a simple and economical strategy to improve cardiovascular health in vulnerable populations. At the beginning of the e-ducass study, we observed that cardiovascular health was similar in men and women although differences were obtained in parameters such as glucose and blood pressure, in which women had better scores, which could help to adapted cardiovascular prevention strategies according to sex.

**Keywords:** cardiovascular health, e-ducass, sex differences, food insecurity, Life's Simple 7, Life's Essential 8

[Abstract:2031]

## IMPROVEMENT IN ACTIVITIES OF DAILY LIVING AND HEALTH STATUS ASSOCIATED WITH THE USE OF ONCE-WEEKLY SEMAGLUTIDE IN VERY OLD PATIENTS WITH TYPE 2 DIABETES, OBESITY, AND HEART FAILURE

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**Background:** The role of GLP-1 receptor agonists in patients with heart failure (HF) remains unclear. This work analysed the efficacy of once-weekly semaglutide in elderly patients with type 2 diabetes, obesity, and HF regarding activities of daily living performance and health status.

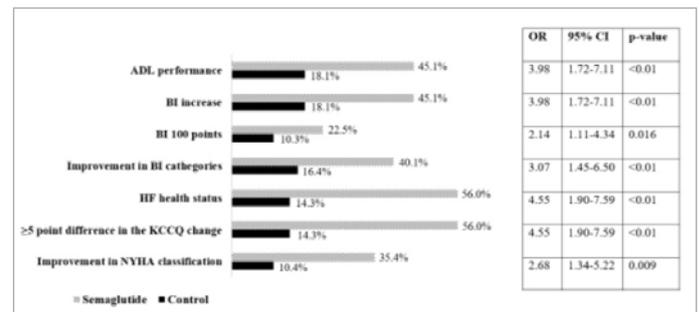
**Methods:** This real-world observational study included patients  $\geq 80$  years with type 2 diabetes and HF treated with semaglutide and patients not treated with GLP-1 receptor agonists. A propensity score analysis matched patients in both groups in a 1:1 manner. The primary outcome was the activities of daily living performance (measured using Barthel Index) and health status (measured with Kansas City cardiomyopathy questionnaire and New York heart association classification) at 24 months. Secondary outcomes included HF and all-cause hospitalizations and cardiovascular and all-cause death. Associations were evaluated using mixed effect logistic regressions.

**Results:** 182 patients were included in each group. The use of once-weekly semaglutide was associated with greater improvement in activities of daily living performance and health status in the sema-old group compared to the control-old group (OR: 3.98; 95% CI: 1.72-7.11;  $p < 0.01$ ; OR: 4.55; 95% CI: 1.90-7.59;  $p < 0.01$ ; respectively). There were declines in HF and all-cause hospitalizations and cardiovascular death. Semaglutide improved glycaemic control and reduced body weight. Negative correlations were observed between the activities of daily living performance and HF health status and body weight ( $r = -6.55$ ,  $p < 0.01$ ;  $r = -5.98$ ,  $p < 0.01$ ; respectively).

**Conclusions:** Once-weekly semaglutide showed an improvement

in activities of daily living performance and heart failure health status in elderly patients with type 2 diabetes and HF.

**Keywords:** age  $\geq 80$ , type 2 diabetes, heart failure, semaglutide, activities of daily living, health status



**Figure 1.** Primary outcomes and components.

Data are shown as percentages. In order to evaluate the association between treatment and study outcomes, mixed effect logistic regressions were used. The regression analysis values were expressed as odds ratio and 95% confidence interval. Values were considered to be statistically significant if  $p < 0.05$ . ADL: activities of daily living; BI: Barthel Index; 95% CI: 95% confidence interval; HF: heart failure; KCCQ: Kansas City Cardiomyopathy Questionnaire; NYHA: New York Heart Association; OR: odds ratio.

Outcomes	Sema-Old Group (n=182)	Control-Old Group (n=182)	Mixed effect logistic regression OR (95% CI)	p-value
ADL performance (n, %)	82 (45.1)	33 (18.1)	3.98 (1.72-7.11)	<0.01
Health status (n, %)	102 (56.0)	26 (14.3)	4.55 (1.90-7.59)	<0.01
Hospitalization due to heart failure (n, %)	27 (14.8)	48 (26.4)	0.82 (0.68-0.99)	0.019
All-cause hospitalizations	38 (20.9)	59 (32.4)	0.85 (0.64-0.99)	0.026
Cardiovascular death (n, %)	19 (10.4)	42 (23.1)	0.88 (0.71-0.99)	0.042
All-cause death (n, %)	33 (18.1)	52 (28.6)	0.92 (0.85-1.25)	0.087

**Table 2.** Primary and secondary outcomes.

Data are shown as absolute values and percentages. In order to evaluate the association between treatment and study outcomes, mixed effect logistic regressions were used. The regression analysis values were expressed as odds ratio and 95% confidence interval. Values were considered to be statistically significant if  $p < 0.05$ . ADL: activities of daily living; 95% CI: 95% confidence interval; KCCQ: Kansas City Cardiomyopathy Questionnaire; NYHA: New York Heart Association; OR: odds ratio.

[Abstract:2036]

## ANTIPHOSPHOLIPID SYNDROME AND PREGNANCY: A DANGEROUS COMBINATION

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A 24-years-old pregnant woman in week 33, with history of triple positive antiphospholipid syndrome diagnosed after an episode of bilateral acute pulmonary thromboembolism. Recent admission to gynaecology for severe pre-eclampsia, discharged with labetalol and heparin. She returned to the emergency department for severe epigastralgia and headache in context of poor blood

pressure control. She had macroscopic haematuria without oliguria or oedema. Physical examination revealed blood pressure 173/90 with no other relevant findings. Laboratory tests showed elevated transaminase GOT 138 U/L and GPT 289 U/L, LDH 449 U/L, preserved renal function and bilirubin in range; haemoglobin decreased to 10.5 g/dL and thrombocytopenia 91,000; worsening proteinuria with protein/creatinine ratio 4513.2 mg/g. Peripheral blood smear ruled out the presence of schistocytes. Given the high suspicion of incomplete Hellp syndrome gestation was terminated. After delivery, the patient presented a torpidevolution, persisting abdominal pain and high blood pressure despite three antihypertensive drugs. An abdominopelvic CT scan revealed the presence of multiple hepatic infarctions. Hellp syndrome is an obstetric complication with high maternal and foetal morbidity, presenting with haemolysis, elevated liver enzymes and low platelet counts. In patients with antiphospholipid syndrome this complication is more frequent, earlier, and generally more severe. Although most cases resolve after expulsion of the placenta, there are some patients in whom the symptoms persist after the end of pregnancy. The management of this situation is very complex and there is no scientific consensus. In the case presented, the patient evolved favourably with IV corticotherapy, heparin and exhaustive control of blood pressure.

**Keywords:** antiphospholipid syndrome, pregnancy, Hellp syndrome

[Abstract:2050]

## NEW APPROACH FOR DIAGNOSTICATION OF METABOLIC SYNDROME

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**Objectives:** of this study is to evaluate opportunities of using of mean arterial pressure (MAP) as a component of the metabolic syndrome (MS) instead systolic and diastolic blood pressures (SBP and DBP) and to evaluate influence of the MS and its components on pulse pressure (PP) and apolipoprotein B/Apolipoprotein A1 (Apo B/Apo A1).

The average value of mean arterial pressure for all persons was 95.17 mmHg and the standard deviation was 10.65 mmHg. Pulse pressure and Apo B/Apo A1 ratio could be used as complex marker for MS.

The ANOVA F-statistic is 17.71 with p-value less than 0.00001. The obtained model showed that for increase of PP with 5 mmHg it was expected about 1.2314 times increase in the odds ratio of MS and for increase of APO B/APO A1 ratio with 0.1 it was expected about 1.6363 times increase in the odds ratio.

Reducing the number of used biochemical marker could improve the cost efficiency in the diagnostication of MS. MAP showed itself as a promising indicator, which after some broader studies could replace SBP and DBP in the MS definition.

When the pulse pressure was wide and wriest was greater than 102/88 cm (men/women) the odds ratio was above 1. These

two factors could be used to diagnose metabolic syndrome. The same conclusion could be made for wide pulse pressure and triglycerides level greater than 1.7 mmol/l. The results showed that PP and wriest or triglycerides level could be used as indicator of metabolic syndrome.

**Keywords:** metabolic syndrome, diagnostication, approach

[Abstract:2059]

## ASSOCIATION BETWEEN SERUM LIPID LEVELS AND ALBUMIN AND PROTEINURIA IN PATIENTS WITH NEPHROTIC SYNDROME

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**Objectives:** Analyse the correlations between serum lipid levels with proteinuria, serum albumin levels, and pathological anatomy in patients with nephrotic syndrome.

**Materials and Methods:** Descriptive-analytical analysis including 111 episodes of Nephrotic Syndrome from 111 patients treated at a tertiary hospital between January 2017 and January 2020.

**Results:** A significant correlation ( $p=0.001$ ) was observed between total cholesterol values and serum albumin; however, no correlation was found between total cholesterol and proteinuria. Total cholesterol also did not correlate with different stages in chronic kidney disease, although several studies indicate that excessive accumulation of cholesterol and cellular lipids could negatively affect cellular function, leading to toxicity and injuries in podocytes. HDL cholesterol showed no correlation with either serum albumin or proteinuria. LDL cholesterol exhibited a correlation with albumin, similar to that observed with total cholesterol. Multivariate analysis revealed that variables associated with total cholesterol and LDL cholesterol were serum albumin and Charlson comorbidity index. The variables proteinuria, gender, history of CKD, presentation with AKI, and previous history of dyslipidaemia did not influence total cholesterol and LDL cholesterol levels. Regarding triglyceride levels, multivariate analysis indicated that both serum albumin and proteinuria were associated with triglycerides, while variables such as gender, history of CKD, presentation with acute kidney injury, previous history of dyslipidaemia, and Charlson comorbidity index did not influence triglyceride levels.

**Conclusions:** Elevated levels of total cholesterol, LDL cholesterol, and triglycerides are related to lower serum albumin levels; however, no relationship was found between total cholesterol, LDL cholesterol, and triglycerides with proteinuria.

**Keywords:** proteinuria, lipid levels, nephrotic syndrome

[Abstract:2085]

## ASSESSMENT OF CARDIOVASCULAR RISK IN PATIENTS ADMITTED TO THE INTERNAL MEDICINE SERVICE - ESSENTIAL ASSESSMENT WITH PROGNOSTIC IMPACT?

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Of the comorbidities presented by patients hospitalized in the Internal Medicine, cardiovascular risk factors stand out, which are highly prevalent in the population and associated with significant morbidity and mortality. Low-density lipoprotein cholesterol (LDL-C) is a well-established risk factor for cardiovascular disease. Retrospective study carried out in 2022, which included patients with a lipid profile requested during hospitalization, randomly selected 20 patients per month. 240 patients were included, with an equal number of patients in each gender and with a median age of 80 years. In these, the most prevalent cardiovascular risk factor was arterial hypertension (79.6%), followed by dyslipidaemia (67.1%), obesity (40.5%), diabetes mellitus (32.9%) and smoking (33.8%). Dyslipidaemia is very prominent, with only 22.6% having adequate metabolic control after application of the SCORE2/SCORE OP scale. The median LDL-C value was 92.5 mg/dL, with 277 patients having high/very high CV risk. The majority of patients were under a pharmacological therapeutic strategy (59.1%), 78.6% were taking statins, of which a third were taking statins low intensity. In 61.9% of patients, pharmacological therapy was initiated or adjusted. No patient with LDL-C experienced cardiovascular events or mortality at 30 days. In the remaining cases, there were 16 cardiovascular events after 30 days, of which there were 2 deaths.

**Conclusions:** Controlling cardiovascular risk factors has a known impact on reducing the occurrence of cardiovascular events and mortality. Hospitalization can be seen as a period for risk assessment with adjustment of therapeutic measures that could have a significant impact on patient survival.

**Keywords:** cardiovascular risk, LDL-C, dyslipidemia

[Abstract:2092]

## LP(A) MEASUREMENT: ARE THE ANALYTICAL CONCERNS TRANSLATED INTO REAL CLINICAL CONCERNS?

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**Purpose:** Lp(a) measurement is recommended with traceability to the WHO/IFCC reference assay and values assigned in molar units. This has brought into question the clinical usefulness of results in mass units. We compared two Lp(a) assays differently calibrated, reporting results in different units, and assessed whether the analytical concerns were translated into clinical concerns.

**Methods:** The Randox Lp(a) assay (standardised against the WHO/IFCC reference material; values in nmol/l) was compared against the Abbott Alinity Lp(a) assay (standardised to in-house reference material; values in mg/dl). Surplus serum samples from our clinic patients were analysed. Their Lp(a)-corrected LDL-C was calculated with Dahlen equation. CVD risk stratification was based on risk grades described in the 2019 HEART UK statement on Lp(a) and the 2019 ESC/EAS guidelines. The strength of the classification agreement was assessed with Cohen's  $\kappa$  index.

**Findings:** Eighty cases with Lp(a) levels covering a wide range were included (3.6-605.2 nmol/l / 3.2-266.3 mg/dl). Based on Lp(a) risk grades, eight patients (10%) were differently classified by the above assays, six with Lp(a) levels >200 nmol/l (>85 mg/dl). Although the overall clinical concordance was very good with  $\kappa=0.815$ , the Alinity assay categorised more cases into the very high-risk group. Based on the Lp(a)-corrected LDL-C results obtained with the different assays, the strength of the classification agreement was again very good ( $\kappa=0.935$ ).

**Conclusions:** The overall clinical concordance of the two assays was strong. The discrepancy in the high end of the risk spectrum does not affect substantially patient management, thus it is unlikely to be clinically significant.

**Keywords:** Lp(a) measurement, analytical concerns, clinical concordance

[Abstract:2098]

## ANALYSIS OF LIPID ALTERATIONS IN PATIENTS WITH NEPHROTIC SYNDROME

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**Objectives:** To describe the percentage of patients with lipid alterations (hypercholesterolemia, hypertriglyceridemia, increased atherogenic index, LDL levels, HDL levels) during an episode of nephrotic syndrome.

**Materials and Methods:** Descriptive-analytical analysis involving 111 episodes of Nephrotic Syndrome from 111 patients treated at a tertiary hospital between January 2017 and January 2020.

**Results:** Plasma concentrations of total cholesterol, LDL, and triglycerides are elevated in virtually all patients. Total cholesterol values ranged from a minimum of 99 mg/dL to a maximum of 644 mg/dL, with a mean of 390 mg/dL. Although some cholesterol values fell within the normal range (<120 mg/dL), 90% had elevated total cholesterol (>200 mg/dL), with 27.03% having cholesterol levels exceeding 400 mg/dL. Regarding LDL cholesterol, over half of the patients (57.66%) had very high cholesterol levels upon admission (>190 mg/dL), and 91.9% had LDL cholesterol levels above the optimal level (<100 mg/dL). HDL cholesterol was decreased in 9.91% of patients, considered at higher risk (<40 mg/dL), and only half of the patients (54.1%) had values above 60 mg/dL (negative risk). As for triglycerides, 72.1% of patients had elevated triglycerides (>150 mg/dL), but only 6.3% had levels above 400 mg/dL.

**Conclusions:** - High prevalence of lipid alterations in patients with nephrotic syndrome, indicating a very high risk of atherosclerosis.  
- Hypercholesterolemia is the most frequent manifestation.  
- More than half of the patients had very high LDL cholesterol upon admission, resulting in an increased atherogenic index.

**Keywords:** nephrotic syndrome, hypercholesterolemia, hypertriglyceridemia

[Abstract:2113]

## PREDICTORS OF LEFT VENTRICULAR CAVITY ENLARGEMENT AND LEFT VENTRICULAR ANEURYSM FORMATION IN PATIENTS WITH ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION

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**Introduction:** The development of post-infarction left ventricular aneurysm (PILVA) leads to increased hospital mortality, frequency of heart failure, and rhythm disorders in patients with myocardial infarction (MI). Left ventricular cavity enlargement (LVCE) towards the apex at the time of discharge from the hospital may be a stage in the formation of PILVA.

**Purpose:** To identify predictors of LVCE and PILVA formation in patients with ST-segment elevation myocardial infarction.

**Methods:** The study included 138 patients hospitalized within the first 24 hours from the onset of clinical symptoms. The examination and treatment were conducted in accordance with clinical recommendations [1], and the levels of sST2, PCSK9, NT-proBNP, and CRP were also determined.

**Results:** Group 1 (n=25) comprised patients with LVCE and PILVA at the time of discharge; Group 2 (n=113) included patients without left ventricular geometry impairment. According to the results of multifactorial regression analysis, with an increase in the sST2 level by 1 ng/l, the odds of LVCE and PILVA formation increased by 1.52 times. In the case of anterior localization of MI, the odds of LVCE and PILVA formation increased by 63.55 times. With an increase in the glomerular filtration rate (GFR) at 2 days after MI by 1 ml/min/1.73m<sup>2</sup>, the odds of LVCE and PILVA formation decreased by 1.07 times.

**Conclusions:** Anterior localization of MI and an increase in sST2 levels increase the odds of LVCE and PILVA formation.

Reference:

1. Russian Society of Cardiology (2020) Clinical practice guidelines for Acute ST-segment elevation myocardial infarction. Russ J Cardiol. 2020;25(11):4103.

**Keywords:** myocardial infarction, left ventricular aneurysm, predictors

[Abstract:2119]

## PREDICTING HOSPITAL MORTALITY IN PATIENTS WITH ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION AGED $\geq 75$ YEARS USING LOGISTIC REGRESSION AND CLASSIFICATION TREE ANALYSIS

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**Purpose:** To investigate risk factors for hospital mortality in patients with ST-segment elevation myocardial infarction (STEMI) on the electrocardiogram (ECG) aged  $\geq 75$ .

**Methods:** The study included 174 patients aged  $\geq 75$  with STEMI on ECG from 2020-2021. The median age was 81 [79-85] years, and 29.9% were male. A predictive model for the probability of in-hospital death was constructed using logistic regression and Chi Squared Automatic Interaction Detection classification tree.

**Results:** Hospital mortality was 24.1%. Based on binary logistic regression, factors increasing hospital mortality included: cardiogenic shock (CS) – odds ratio (OR) 39.04; 8.87–171.74;  $p < 0.001$ ; ventricular tachycardia (VT) – OR 60.52; 5.21–703.45;  $p = 0.001$ ; leukocyte count (L) – for each increase by  $1 \times 10^9/L$  – OR 1.15; 1.05–1.26;  $p = 0.002$ ; factors decreasing mortality were: chronic heart failure (CHF) in history – OR 0.04; 0.009–0.21;  $p < 0.001$ . Classification tree analysis revealed 100% mortality in patients with CS in the absence of diabetes mellitus (DM) and previous myocardial infarction (MI), and in patients with pulmonary edema in the absence of CS, VT, and CHF in history. Mortality was 83.3% in patients without CS and VT but with a history of CHF,  $L > 14.5 \times 10^9/L$ , and body mass index  $\leq 23.7 \text{ kg/m}^2$ . A mortality rate of 75.0% was observed in patients without CS but with VT, as well as in patients with CS without DM and with a history of MI. Patients with CS and DM had a mortality rate of 50.0%.

**Conclusions:** The strongest factors associated with the risk of in-hospital death were CS, VT, and a high leukocyte count.

**Keywords:** cardiogenic shock, ventricular tachycardia, prognosis

[Abstract:2124]

## MYOCARDIAL INFARCTION IN INDIVIDUALS AGED 75 AND OLDER: FACTORS INFLUENCING HOSPITAL MORTALITY

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Currently, there is a lack of reliable evidence regarding the effectiveness and safety of invasive intervention strategies recommended in clinical guidelines for elderly individuals, especially those who have reached an advanced age. Therefore,

to assess the true benefits and risks of contemporary approaches to managing patients with myocardial infarction (MI) aged  $\geq 75$  years, it is necessary to turn to observational studies, particularly registries.

**Purpose:** Identify factors influencing hospital mortality in patients with MI aged  $\geq 75$  years.

**Methods:** A retrospective analysis of medical records data from 437 patients aged  $\geq 75$  years hospitalized with a diagnosis of MI (I21 according to ICD-10) from January 1, 2020, to December 31, 2021, was conducted. The assessment included comorbidities, clinical presentation, results of laboratory examinations, treatment, and their impact on hospitalization outcomes.

**Results:** Hospital mortality was 22.2%. The presence of cardiogenic shock upon admission (odds ratio (OR) 31.28; 95% confidence interval (CI) 5.7 – 171.53;  $p < 0.001$ ), second- to third-degree atrioventricular block (OR 4.67; 95% CI 1.02 – 21.38;  $p = 0.04$ ), and a GRACE score  $\geq 166$  for acute coronary syndrome without ST-segment elevation on the electrocardiogram (OR 7.19; 95% CI 1.01 – 51.43;  $p < 0.001$ ) had an adverse impact on prognosis.

**Conclusions:** Cardiogenic shock, second- to third-degree atrioventricular block, and a GRACE score  $\geq 166$  for patients with acute coronary syndrome without ST-segment elevation on the electrocardiogram are factors associated with increased hospital mortality in patients aged 75 and older.

**Keywords:** cardiogenic shock, atrioventricular block, GRACE score

[Abstract:2128]

## CHANGES IN THE PRESCRIPTION OF THE ANTITHROMBOTIC THERAPY IN PATIENTS WITH ATRIAL FIBRILLATION AND MYOCARDIAL INFARCTION IN 2016-2021

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**Aim:** To study the changes in the prescription of the antithrombotic therapy (ATT) among the patients with myocardial infarction (MI) and atrial fibrillation (AF), hospitalized in a cardiology hospital in 2016-2021.

**Methods:** The study included 599 patients with MI and AF: from 2016 to 2017 – 104 patients, from 2018 to 2019 – 256 patients, from 2020 to 2021 – 239 patients.

**Results:** From 2016 to 2017 the patients with MI and AF in 76.9% of cases were prescribed dual antiplatelet therapy (DAPT), in 16.3% - oral anticoagulant therapy (OAC), while in 6.7% - as part of triple ATT, in 8.7% - dual ATT (OAC + antiplatelet agent), in 1.0% - OAC monotherapy, in 3.8% antiplatelet monotherapy was prescribed, in 2.9% ATT was not prescribed. From 2018 to 2019 in 37.9% - DAPT, in 54.7% - OAC therapy: in 44.9% - part of triple ATT, in 9.8% - dual ATT, in 7.4% monotherapy. From 2020 to 2021 in 15.9% - DAPT, in 74.5% - OAC therapy, of which 59.8% - triple

ATT, 14.2% - double ATT, 7.5% - monotherapy, in 1.7% ATT was not prescribed.

**Conclusions:** The rate of the triple antithrombotic therapy at the discharge from 2020 to 2021 increased 8.9 times compared to the period from 2016 to 2017 and amounted to 59.8% (n=115), p for all periods <0.001. The prescription rate of OAC from 2020 to 2021 increased 4.6 times compared to the period from 2016 to 2017 and amounted to 74.5%, p for all periods < 0.001.

**Keywords:** oral anticoagulant therapy, dual antiplatelet therapy, antithrombotic therapy

[Abstract:2129]

## SENILE ASTHENIA SYNDROME IS A PREDICTOR OF POOR PROGNOSIS IN PATIENTS WITH ACUTE DECOMPENSATED HEART FAILURE

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**Aim:** To study 1-year survival and identify factors of adverse prognosis in patients hospitalized due to ADHF.

**Materials and Methods:** We examined 80 patients hospitalized in the Ryazan Regional Clinical Cardiology Dispensary due to ADHF, average age 68.4±11.1 years, 62.5% were males. Screening for signs of senile asthenia syndrome (SAS) was performed using the "Age is not a hindrance" questionnaire.

**Results:** 28.7% had signs of SAS and were characterized by a higher prevalence of hypertension (100% vs 89.5%, p<0.05), coronary heart disease (73.9% vs 49.1%, p<0.05), iron deficiency (95.7% vs 73.7%, p<0.01) and shorter 6-minute walk test distance (146.3±45.3 m vs 205.3±78.5 m, p=0.003). In-hospital mortality in ADHF is 3.75%, survival 3 months after an episode of ADHF is 80.0%, after 6 months – 70.0%, after 12 months – 58.7%. In a one-factor Cox regression analysis model, a higher risk of death from all causes was associated with factors such as functional class of CHF (relative risk (RR) 1.49, p=0.031), history of stroke (OR 2.54, p=0.029), SAS (OR 2.81, p=0.003), valvular heart defects (OR 4.22, p<0.0001), anasarca (OR 2.49, p=0.043), leukocytosis (RR 1.12, p=0.038), increased urea level (RR 1.06, p=0.036), NT-proBNP (RR 1.50, p=0.001). In the multifactorial model, only the presence of SAS proved to have an impact on the prognosis (OR 4.89, p=0.001).

**Conclusions:** The survival rate of patients hospitalized due to ADHF progressively worsens and by the 12<sup>th</sup> month is 58.7%. In the multifactorial model, only SAS was a predictor of poor 1-year prognosis.

**Keywords:** senile asthenia syndrome, prognosis, acute decompensated heart failure

[Abstract:2130]

## CARDIOVASCULAR RISK IN INTERNAL MEDICINE. ATTAINMENT OF GOALS AND THERAPEUTIC INERTIA

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**Aim:** To evaluate the attainment of goals in cardiovascular risk (CVR) management in population of Internal-Medicine office, checking the therapeutic inertia.

**Methods:** Cross-sectional study in consecutive patients 40-85 years classified as low, moderate, high and very-high CVR according to the ESC/EAS-2019 and ESC-2021 guidelines (therapeutic goals: LDL-c <116/100/70/55 mg/dl, systolic blood pressure<130 mmHg and HbA1c <7.0% in diabetics). In those who did not achieve therapeutic goals, it was evaluated whether modifications of the cardiovascular prevention treatment had been planned. Ethical committee approval 03.23.2164-GHM.

**Results:** One-hundred patients were included (mean-age: 62.6 years; 35% women; 16% ASCVD, 24% type 2 diabetes, 11% smokers). CVR categories (ESC/EAS-2019) were: low (14%), moderate (45%), high (24%) and very-high (17%). Reclassification using SCORE 2-OP (ESC-2021) was: low-moderate (39%), high (35%) and very-high (26%). Globally, 34% (ESC/EAS-2019) and 25% (ESC-2021) achieved the therapeutic goal of LDL-c (Figure 1). Among patients who did not reach the LDL-c goal, therapeutic modifications to optimize control were planned in 44% of very-high risk, 27% of high risk, and 39% of low-moderate risk.

**Conclusions:** The degree of attainment of therapeutic goals was very low, regardless of the CVR degree. It was alarming that more than 50% of patients with very-high risk did not reach the lipid goal; and it is especially worrying that in less than 50% of them therapeutic modifications were planned. Therefore, it is urgent to undertake new actions to achieve the goals and avoid therapeutic inertia. Among these, to include the healthcare implementation of precision medicine with molecular pathophysiological phenotyping would allow complementing diagnosis and monitoring therapeutic response, and identification of molecular targets.

**Keywords:** cardiovascular- risk stratification, therapeutic inertia, goals

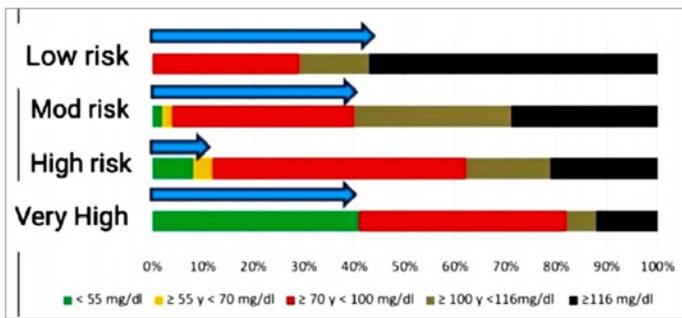


Figure 1. Achievement of LDLc goals according to risk category according to categories and goals of the EAS/ESC 2019 guidelines (the blue arrow indicates the percentage of patients in each category who achieve the goal).

[Abstract:2133]

## UNSTABLE ANGINA PECTORIS-NEW CHALLENGES IN THE REPERFUSION ERA: EPIDEMIOLOGY, GENDER DIFFERENCES, CORONAROANGIOGRAPHY RESULTS, 1-YEAR FOLLOW-UP

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We have analysed 316 cases of unstable angina's (UA) patients hospitalised to the ICU with suspected ACS. 183 of them were males (57.9%), 133 - females (42.1%). UA in all ACS decreased from 36% to 13% last 5 years. Average age was  $63.6 \pm 10.5$  years in males,  $71.5 \pm 9.9$  years in females ( $p \leq 0.05$ ). Medical history was different in terms of diabetes mellitus - 15.3% in males, 39.2% in females, dyslipidaemia 48.1% versus 59.4%, stroke 7.7% versus 14.4% respectively ( $p \leq 0.05$ ). All other points (MI, hypertension, LV dysfunction, atrial fibrillation) had no gender differences. We to emphasize that 36.6% were undergone APTCI in average  $2.1 \pm 0.3$  years ago. 25% were post COVID-19 in last year.

CAG was performed to 76% (of 24% leaved  $\frac{1}{3}$  refused,  $\frac{1}{3}$  had contraindications,  $\frac{1}{3}$  - low GRACE risk). CAG showed 32% non obstructive CAD (generally post COVID-19), 50% multivessel lesions, 11% - old stents restenosis, 4% monovessel lesion, 3% - chronic occlusion.

Inhospital mortality was 0%. 52% were undergone APTCI. Complete revascularization was reached in 30% cases.

1- year follow-up revealed 8% mortality (all except one patient with malignancy were due to cardiovascular reasons), 75% were rehospitalized about ACS (25%), decompensated heart failure (16%), paroxysmal atrial fibrillation (23%), stroke (10%), non-cardiovascular reasons (26%). Targeted LDL-C levels were reached in 10% patients only.

**Conclusions:** 1. UA, that decreased last years among all cases of ACS is effectively treated in-hospital with strong antithrombotic and coronary interventions but leaves high - risk situation in

follow-up period and requires great attention from out- patient cardiologists.

**Keywords:** unstable angina, revascularization, 1-year follow-up, re-hospitalizations, gender differences

[Abstract:2147]

## LIPID METABOLISM DISORDERS IN INDIVIDUALS WITH PREHYPERTENSION IN THE POPULATION OF THE RYAZAN REGION (BASED ON ESSE-RF-2 DATA)

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**Purpose:** To study the prevalence of subclinical markers of cardiovascular morbidity/mortality and cardiovascular disease in patients with inflammatory bowel disease, to determine the frequency of carriage of the allelic polymorphic variant of the NOD2/CARD15 gene (3020 insC rs5743293), and to assess the presence of associations.

**Methods:** The multicentre study included 105 patients with inflammatory bowel disease, with any disease history and baseline therapy (age 43.5 [IQR, 33.0- 55.0] years). The following were performed: study of medical records, echocardiography, assessment of cardiac ankle vascular index, ECG Holter monitoring, daily blood pressure monitoring, treadmill test, determination of polymorphisms by allele-specific polymerase chain reaction (in 62 patients).

**Findings:** Arterial hypertension was diagnosed in 39% of patients (the prevalence of arterial hypertension among 25-64 year olds in the region is 45.9%), coronary heart disease in 8.6%, and atrial fibrillation in 3 patients. Diastolic dysfunction was detected in every fourth patient (25.7%). Left ventricular myocardial hypertrophy in 11.4%. The calculated vascular age was less than the passport age in 37.1% of patients and exceeded the passport age in 26.6%. An association of arterial hypertension with the 3020insC polymorphism in the CARD15(NOD2) gene rs5743293 was found (Chi-square 4.65;  $p = 0.031$ ).

**Conclusions:** A statistically significant association of arterial hypertension with the 3020insC polymorphism in the CARD15(NOD2) gene rs5743293 was found. The prevalence rates of arterial hypertension in patients with inflammatory bowel disease do not exceed the values obtained in the epidemiological study MERIDIAN-RO in the region.

**Keywords:** prehypertension, lipid profile, risk factor

[Abstract:2150]

## ATRIAL FIBRILLATION IN ELDERLY INDIVIDUALS: COMPARATIVE ANALYSIS OF CLINICAL AND LABORATORY PARAMETERS IN DIFFERENT GROUPS

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Atrial fibrillation (AF) is a common cardiac rhythm disorder in the elderly. The risk of AF paroxysms increases with age.

**Objective:** To assess data from elderly patients hospitalized at the Ryazan Cardiological Dispensary with a diagnosis of AF and evaluate differences in indicators based on AF form.

**Methods:** An analysis of examination results was conducted on 552 patients suffering from atrial fibrillation and hospitalized at the Ryazan Cardiological Dispensary. The average age was  $81.62 \pm 4.30$  years. Patients were categorized into groups based on AF form.

**Findings:** In the permanent AF group, the left atrium size was  $4.89 \pm 0.58$  cm, significantly larger than in patients with paroxysmal/persistent AF ( $4.47 \pm 0.52$  cm) and significantly larger than in the group without AF ( $4.34 \pm 0.51$  cm,  $p=0.01$ ). The ejection fraction (EF) in the group without AF was  $51.13 \pm 10.70\%$ , significantly lower than in the permanent AF group ( $52.76 \pm 11.14\%$ ) and the paroxysmal/persistent AF group ( $56.98 \pm 9.76\%$ ,  $p=0.01$ ).

**Conclusions:** This study allows identification of indicators that require attention in elderly patients with AF.

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**Keywords:** atrial fibrillation, elderly, echocardiography

[Abstract:2154]

## ANALYSIS OF LIPID METABOLISM IN THE POPULATION OF RYAZAN REGION WITH ARTERIAL HYPERTENSION

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**Purpose:** This study aims to examine lipid metabolism indicators in the population of the Ryazan region with arterial hypertension (AH).

**Methods:** Within the framework of the study ESSE2-RF-2, 202 individuals with hypertension (group A, aged  $45.5 \pm 8.85$  years, 51.48% females), and 143 individuals with elevated BP but without a diagnosis of hypertension, not taking antihypertensive drugs

(group B, aged  $46.3 \pm 10.5$  years, 51.05% females), were examined for lipid metabolism. The study included the assessment of total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), and triglycerides (TG).

**Findings:** Among the 202 individuals in group A, 80.69% had disturbances in at least one lipid metabolism parameter. In group B, out of 143 individuals, 80.42% had disturbances in at least one parameter. The average level of TC in group A was  $5.30 \pm 0.78$ , significantly lower than in group B ( $5.60 \pm 0.70$  mmol/L,  $p=0.019$ ). LDL-C levels were  $3.05 \pm 0.62$  and  $3.30 \pm 0.71$  mmol/L in group A and group B, respectively ( $p=0.013$ ), while TG levels were  $1.34 \pm 0.38$  and  $1.45 \pm 0.42$  mmol/L ( $p=0.701$ ). The prevalence of elevated TC was 66.83% and 72.03% ( $p=0.242$ ), LDL-C was 52.47% and 65.34% ( $p=0.020$ ), and TG was 36.10% and 36.36% ( $p=0.966$ ) in group A and group B, respectively.

**Conclusions:** In individuals with non-treated elevated blood pressure, significantly higher levels of TC and LDL-C were observed compared to individuals with hypertensive disease. It was established that disturbances in at least one lipid metabolism parameter were present in 80.42% and 80.62% of cases in group A and B, respectively.

**Keywords:** arterial hypertension, lipid metabolism, risk factor

[Abstract:2163]

## STUDY OF CONVENTIONAL ECHOCARDIOGRAPHY PARAMETERS IN PATIENTS WITH BEHÇET'S DISEASE

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**Introduction:** Cardiac involvement in Behçet's disease (MB) is rare, with prevalence varying from 1 to 6% in different series. The objective of our study is to evaluate the parameters of conventional echocardiography in patients with MB.

**Patients and Methods:** This is a prospective study of 36 patients with MB without cardiovascular comorbidities and 36 age- and sex-matched control subjects. Two-dimensional echocardiography was used to measure left ventricular dimensions (end-diastolic and telesystolic diameters), wall thickness (interventricular septum (IVS) and posterior wall), left ventricular ejection fraction (LVEF) (Simpson method) and left atrial volume.

**Results:** The median age of MB patients was 42 years, with a sex ratio of 3.5. The mean duration of disease was  $104.75 \pm 101.83$  months (minimum 8, maximum 336 months). Comparison of the results of conventional echocardiography between the two groups showed that there was no significant difference in LVEF between the 2 groups ( $60.6 \pm 5.1$  versus  $62.4 \pm 4.8$ ).

Left ventricular dimensions were comparable in the 2 groups. Left atrial volume was significantly higher in the MB group:  $27.5 \pm 5.7$  versus  $24.6 \pm 5.6$  ( $p=0.04$ ). IVS thickness, posterior wall thickness

and aortic diameter were normal in both groups but higher in the control group with values close to significance respectively at  $8.8 \pm 1.7$  versus  $9.5 \pm 1.5$  ( $p=0.07$ ),  $8.7 \pm 1.7$  versus  $9.4 \pm 1.6$  ( $p=0.06$ ) and  $20.1 \pm 1.9$  versus  $20.9 \pm 1.8$  ( $p=0.07$ ).

**Conclusions:** Our study did not identify any significant sub-clinical morphological cardiac involvement in patients with MB. The results of our study deserve to be investigated further by other large cohort prospective multicentre studies.

**Keywords:** Behçet disease, echocardiography, cardiac involvement

[Abstract:2165]

## NEW PERSPECTIVES IN THE STUDY OF ANXIETY AND DEPRESSION AMONG PATIENTS WITH ARTERIAL HYPERTENSION IN THE RYAZAN REGION (BASED ON ESSE-RF-2 DATA)

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**Purpose:** Evaluate the association between anxiety, depression levels, and various socio-demographic characteristics in patients with hypertension in the Ryazan region.

**Methods:** Survey results of 402 individuals under observation in ESSE 2 study, diagnosed with arterial hypertension (average age 50.1, 59% females), were analysed. Perceived stress scale measured stress sensitivity, and hospital anxiety and depression scale assessed anxiety and depression levels.

**Findings:** Anxiety levels in hypertensive patients were significantly higher in females (Me: 6.50) compared to males (Me: 4.50,  $p<0.001$ ). Patients with no or lower education had higher anxiety levels (Me: 8.00) compared to those with average education (Me: 5.00,  $p=0.031$ ). Employed individuals had lower anxiety levels (Me: 4.50) than unemployed ones (Me: 6.00,  $p=0.010$ ).

Significant differences were found in anxiety levels based on financial status ( $p=0.041$ ), with wealthier patients having lower anxiety (Me: 5.00) than those with average (Me: 6.00) or lower income (Me: 6.50). Stress and anxiety showed a noticeable positive correlation, described by the regression equation:  $Y_{\text{Stress}}=0.931 \times X_{\text{Anxiety}}+8.791$ .

Depression levels were significantly higher in females (Me: 5.00) compared to males (Me: 4.00,  $p=0.044$ ). Significant differences were observed based on financial status ( $p=0.002$ ), with wealthier and average income patients (Me: 4.00) having lower depression than those with lower income (Me: 7.00).

A moderate positive correlation was found between stress and depression, described by the regression equation:  $Y_{\text{Stress}}=0.87 \times X_{\text{Depression}}+9.874$ .

**Conclusions:** Female gender, lower education, unemployment, low income, and elevated stress levels contribute to increased anxiety in hypertensive patients. Female gender, low income,

and elevated stress levels contribute to increased depression in hypertensive patients.

**Keywords:** arterial hypertension, anxiety, depression, risk factors

[Abstract:2169]

## ANALYSIS OF CARBOHYDRATE METABOLISM IN THE POPULATION OF RYAZAN REGION WITH ARTERIAL HYPERTENSION

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**Purpose:** To study indicators of carbohydrate metabolism in the population of Ryazan region suffering from arterial hypertension.

**Methods:** In a sample of 468 individuals with arterial hypertension (average age  $48.1 \pm 1.2$  years, 62.8% females), an investigation into the state of carbohydrate metabolism was conducted. Glucose, insulin, glycated haemoglobin (HbA1c) levels were determined in fasting conditions, and the triglyceride/glucose index (TyG) was calculated for all patients.

**Findings:** Among the 468 patients, 8.8% ( $n=41$ ) had confirmed diabetes mellitus (DM).

In patients diagnosed with DM, the average levels of fasting glucose, HbA1c, and blood insulin were  $9.17 \pm 1.51$  mmol/L,  $7.52\% \pm 0.74$ , and  $40.64 \mu\text{U/ml} \pm 6.6$ , respectively. The target level of HbA1c was achieved in only 53.7% ( $n=22$ ) of patients with DM. The TyG index was elevated, reaching  $9.45 \pm 0.28$ .

In 427 patients without DM, the average levels of fasting glucose, HbA1c, and blood insulin were  $5.70 \pm 0.23$  mmol/L,  $5.45 \pm 0.08\%$ , and  $13.89 \pm 1.39 \mu\text{U/ml}$ , respectively. More than a third of individuals (37.7%) had various carbohydrate metabolism disorders (29.7% ( $n=127$ )-impaired fasting glycemia (glucose 5.6-6.9 mmol/L), and 8.0% ( $n=34$ )-glucose  $\geq 7.0$  mmol/L). The TyG index averaged  $8.77 \pm 0.08$ , with 67.9% having values below 9, and 32.1% having higher values (27.2% between 9 and 10, 4.9% above 10).

**Conclusions:** In patients with arterial hypertension in Ryazan region without a confirmed diagnosis of DM, based on the examination of blood glucose, HbA1c, and insulin levels, more than a third of individuals had carbohydrate metabolism disorders. The study of the triglyceride-glucose index revealed an increased risk of cardiovascular complications in 32.1% of cases.

**Keywords:** hypertension, carbohydrate metabolism, risk factors.

[Abstract:2172]

## LIFESTYLE HABITS ACCORDING TO THE CHRONOTYPE AMONG A VULNERABLE POPULATION AT RISK OF FOOD INSECURITY

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**Background and Objective:** Chronodisruption has been associated with cardiovascular risk. Evening chronotype individuals show a predisposition to suffer chronodisruption and unhealthy lifestyle habits. Our objective was to assess lifestyle habits according to the chronotype among a vulnerable population at risk of food insecurity, from the E-ducass study.

**Materials and Methods:** We carried out a cross-sectional study including 460 subjects from the E-ducass study (NCT05379842), a health educational clinical trial. We classified the subjects as more morning-type or more evening-type, according to the morningness-eveningness questionnaire. The participants filled out sociodemographic and lifestyle questionnaires including the Mediterranean diet adherence score (MEDAS).

**Results:** Subjects classified as more evening-type had feeding timing such as breakfast (9:24 hours vs 8:42 hours,  $p<0.01$ ), lunch (14:42 hours vs 14:30 hours,  $p=0.05$ ) and dinner (21:42 hours vs 21:18 hours,  $p<0.01$ ), in addition of sleep timing such as bedtime (23:54 hours vs 23:06 hours,  $p=0.01$ ) and wake up (8:00 hours vs 7:18 hours,  $p<0.01$ ) significantly later than more morning-type subjects. Interestingly, the more evening-type participants also had less duration of sleep (7.5 hours vs 8.1 hours,  $p=0.04$ ), lower adherence to a Mediterranean diet (7.5 points vs 8.2 points,  $p=0.04$ ), lower total weekly physical activity (4:48 hours vs 5:54 hours,  $p<0.01$ ) and more sedentarism compared to more morning-type participants.

**Conclusions:** More evening-type adult subjects had unhealthy lifestyle habits compared than more morning-type subjects. Therefore, to assess chronotype in a vulnerable population could help us to provide tailored recommendations focused on lifestyle habits to improve their cardiovascular health.

**Keywords:** chronotype, cardiovascular disease, food insecurity, vulnerable population

[Abstract:2189]

## IMPACT OF OBESITY ON TAVI OUTCOMES

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**Background:** Obesity is related to an increased risk for cardiovascular diseases and worse outcomes after interventional procedures. There are limited data about the impact of obesity on transcatheter aortic valve implantation (TAVI) outcomes. We aimed to evaluate the effects of obesity on TAVI related outcomes.

**Methods:** All of the patients who underwent TAVI between 2013 and 2020 were screened and cases with accessible data were included. The primary outcome was overall mortality and in-hospital mortality, and TAVI-related complications were determined as secondary outcomes.

**Results:** A total of 273 patients were included. The mean age was  $76.0\pm 10.3$  years and 62.3% of the population were female. Patients were grouped into three arms based on BMI values. Age was similar among the groups and the female gender ratio was higher obese group than the other 2 groups ( $p=0.001$ ). The baseline characteristics and outcomes were presented in Table 1. Both the overall and in-hospital mortality rates were similar between the groups. Stroke significantly occurred more in obese and overweight patients than normal weight group ( $p=0.016$ ). The frequency of contrast induced nephropathy and need for pacemaker implantation was higher in obese patients than other two groups however these findings did not reach statistical significance (Table 1).

**Conclusions:** Although mortality rate after TAVI does not differ according to the body weight, stroke incidence is significantly higher in obese and overweight patients than cases with normal weight during follow-up. Weight loss and reaching normal weight range also should be another goal in overweight and obese TAVI patients.

**Keywords:** obesity, TAVI, mortality, stroke, contrast induced nephropathy

Table-1. Baseline characteristics and outcomes of the study population				
	Baseline characteristics			p value
	Normal weight (BMI=18.5-25 kg/m <sup>2</sup> ) n=93	Overweight (BMI: 25 to <30 kg/m <sup>2</sup> ) n=110	Obese (BMI >30 kg/m <sup>2</sup> ) n=70	
Age, years	75.1 ± 12.8	77.2 ± 8.3	75.2 ± 9.2	0.263
Gender, female, n (%)	53 (57.0 %)	61 (55.5 %)	56 (80.0%)	0.001*
<b>Comorbidities, n (%):</b>				
- Hypertension	61 (65.6 %)	87 (79.1 %)	56 (80.0 %)	0.048*
- Diabetes	23 (24.7%)	38 (34.5 %)	26 (37.1 %)	0.172
- Coronary artery disease	41 (44.1 %)	54 (49.1 %)	19 (27.1%)	0.011*
- Chronic kidney disease <sup>a</sup>	13 (14.0 %)	8 (7.3 %)	8 (11.4 %)	0.286
- Atrial fibrillation	14 (15.1 %)	21 (19.1%)	19 (27.1%)	0.162
<b>Medications, n (%):</b>				
- Beta blockers	55 (59.1 %)	70 (63.6 %)	51 (72.9 %)	0.182
- Statins	39 (41.9 %)	46 (41.8 %)	22 (31.4%)	0.297
- RAS blockers	47 (50.5%)	57 (51.8 %)	41 (58.6 %)	0.559
- Anticoagulants	23 (24.7%)	19 (17.3%)	21 (30.0%)	0.126
<b>Echocardiographic evaluation:</b>				
- LVEF, %	54.1 ± 12.8	54.6 ± 10.7	54.2 ± 11.6	0.959
- AV gradient (mean), mmHg	47.6 ± 15.7	45.6 ± 15.4	43.5 ± 11.9	0.210
<b>Laboratory parameters:</b>				
- Hemoglobin, g/dL	11.9 ± 1.65	12.0 ± 1.8	11.9 ± 1.6	0.953
- GFR, mL/min/m <sup>2</sup>	71.2 (5.8-154.6)	68.2 (58-128.5)	66.2 (4.9-98.4)	0.463
- BNP, pg/mL	443 (28.0-7652)	299 (36.4-18474)	364 (18-3033)	0.674
<b>Outcomes</b>				
Overall mortality, n (%)	27 (29.0 %)	35 (31.8 %)	22 (31.4 %)	0.968
In-hospital mortality, n (%)	5 (5.4 %)	6 (5.5 %)	3 (4.3 %)	0.933
Pericardial effusion, n (%)	15 (16.1 %)	27 (24.5 %)	11 (15.7 %)	0.217
CIN, n (%)	9 (9.7 %)	18 (19.4 %)	15 (21.4 %)	0.106
Stroke, n (%)	1 (1.1 %)	10 (9.1 %)	6 (8.6 %)	0.016*
Insertion site complications, n (%)	18 (19.4 %)	18 (16.4 %)	12 (17.1 %)	0.852
Pacemaker implantation, n (%)	21 (22.6 %)	21 (19.1 %)	24 (34.3 %)	0.068
<b>Abbreviations:</b> AV: Aortic valve, RAS: Renin angiotensin system, LVEF: Left ventricular ejection fraction, MR: Mitral regurgitation, BNP: B-type natriuretic peptide, CIN: Contrast induced nephropathy				
*p values 0.05 were accepted as statistically significant				
<sup>a</sup> Chronic kidney disease is defined as GFR < 60 mL/min/m <sup>2</sup> for at least 3 months				

Table 1. Baseline characteristics and outcomes

[Abstract:2207]

## ANALYSIS OF A SERIES OF 111 OUTBREAKS IN PATIENTS WITH NEPHROTIC SYNDROME

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**Objectives:** To perform an epidemiological description of nephrotic syndrome outbreaks in a series of patients.

**Materials and Methods:** Descriptive-analytical analysis including 111 outbreaks of nephrotic syndrome in 111 patients treated at a tertiary hospital between January 2017 and January 2020.

**Results:** A total of 111 outbreaks (in 76 patients) were analysed. A higher incidence was observed in males: 70 patients were male (63.1%) and 41 were female (36.9%). Regarding gender, it was observed that there was only a significant difference in the Charlson index, which was higher for males (3.04) than for females (1.9), but there were no differences in terms of patient age at the first outbreak or the number of medications. The mean age at the first outbreak was 54 years, with a wide age range between 17 and 85 years. It was observed that out of the 111 analysed outbreaks, 92 outbreaks (82.6%) occurred in patients without previous chronic kidney disease upon admission. In the study, the most common primary glomerulopathies were membranous nephropathy, present in 30 patients (27%), minimal change

disease in 24 patients (21.6%), mesangial in 25 patients (22.5%), and focal segmental glomerulosclerosis in 18 patients (16.2%). Renal biopsy was not performed in 4 patients, and in 1 patient, the biopsy was inconclusive.

**Conclusions:** - Nephrotic syndrome predominates in males.

- Male patients showed a higher 10-year mortality rate compared to female patients.
- Nephrotic syndrome affects a previously healthy kidney.
- The most frequent glomerulopathy in nephrotic syndrome is membranous nephropathy.

**Keywords:** nephrotic syndrome, descriptive-analytical analysis, outbreaks

[Abstract:2211]

## RELATIONSHIP BETWEEN IMPAIRED GLOBAL LEFT VENTRICULAR DEFORMATION AND ENDOTHELIAL FUNCTION IN HYPERTENSIVE PATIENTS

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**Objective:** To study the global longitudinal deformation of the left ventricle and signs of endothelial dysfunction in violation of diastolic relaxation of the left ventricle in hypertensive patients.

**Materials and Methods:** 221 patients with stage 1 and 2 essential hypertension (mean age 42±9.4 years) and 86 healthy subjects (mean age 38±5.4 years) were examined. The blood levels of nitrates and nitrites were assessed. The endothelin content was studied using an ELISA kit. The global deformation was determined by the method of non-Doppler mode of Gray-scale deformation. Mann-Whitney, chi-square and Fisher's exact tests were used. Differences were considered to be statistically significant at p < 0.05.

**Results:** 96 pts had left ventricular (LV) diastolic dysfunction (DD) and 125 pts had no. Endothelin levels were the same in all groups. The amount of nitrites and nitrates was lower in the group of patients with hypertension in combination with LV DD by 52% compared to the control and by 13% compared to the group of patients without DD. These changes were interrelated with a decrease in the global longitudinal deformation of the left ventricle. The correlation analysis revealed negative relationship between the global longitudinal deformation of LV and the content of nitrates (r= -0.64, p=0.004), negative correlation between the LV mass index and the concentration of nitrites (r= -0.54, p=0.047).

**Conclusions:** In hypertensive patients with diastole violation a decrease in the function of the endothelium was revealed, which is interrelated with a decrease in the global deformation of the left ventricle.

**Keywords:** hypertension, endothelium, left ventricle

[Abstract:2223]

## SERUM LIPID LEVELS AND THEIR CORRELATION WITH MARKERS OF ENDOTHELIAL DYSFUNCTION

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**Objectives:** To analyse the existing correlations between serum lipid levels and markers of endothelial dysfunction (neutrophil/lymphocyte ratio; platelet/lymphocyte ratio).

**Materials and Methods:** Clinical-analytical analysis of 111 outbreaks of nephrotic syndrome in 111 patients treated at a tertiary hospital between January 2017 and January 2020. Pearson's correlation coefficient was used to analyse the correlation between quantitative variables. In cases where the variable did not show a normal distribution, Spearman's rank correlation coefficient was used.

**Results:** The neutrophil/lymphocyte ratio showed a significant correlation with total cholesterol ( $p=0.020$ ) and LDL cholesterol ( $p=0.020$ ). Higher neutrophil/lymphocyte ratios were associated with lower levels of total cholesterol and LDL cholesterol in patients. Study patients with acute kidney failure or pre-existing chronic kidney disease showed significantly lower cholesterol levels. No correlation was observed for other lipids (triglycerides, cholesterol, atherogenic index). There was no significant correlation between NLR and albumin or proteinuria. Similarly, no relationship was found between NLR and different pathological presentations, suggesting that the level of inflammation across various pathological presentations is consistent. The platelet/lymphocyte ratio is also an inflammation marker; however, in this study, no correlation was observed with total cholesterol or LDL cholesterol. There was also no correlation with triglycerides, atherogenic index, or HDL cholesterol.

**Conclusions:** A higher neutrophil/lymphocyte ratio is associated with lower levels of total cholesterol and LDL cholesterol, indicating that a higher degree of patient disease/inflammation implies a reduced capacity to synthesize cholesterol. No relationship was found between the platelet/lymphocyte ratio and total cholesterol or LDL cholesterol.

**Keywords:** neutrophil/lymphocyte ratio, platelet/lymphocyte ratio, nephrotic syndrome, serum lipid levels

△ The authors did not provide Figure 1 and Figure 2 upon requests from the event organizer.

[Abstract:2225]

## GENDER-SPECIFIC DIFFERENCES IN ACUTE CORONARY SYNDROMES

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**Aim:** To evaluate gender-specific etiology, clinical presentation, diagnostic and therapeutic interventions in patients with acute coronary syndrome (ACS).

**Methods:** 80 men and 80 women with ACS were included in a retrospective cross-sectional study. Mann-Whitney, chi-square and Fisher's exact tests were used. Differences were considered to be statistically significant at  $p < 0.05$ .

**Results:** Women with ACS were older than men:  $68.5 \pm 10.8$  vs  $54.7 \pm 9.8$  years ( $p < 0.0001$ ). ACS with ST-segment elevation more often developed in men – 68.8% vs 35% in women ( $p < 0.0001$ ). Family history of cardiovascular disease was more common in women (76% vs 38%,  $p < 0.0001$ ), smoking – in men (62.5% vs 34%,  $p < 0.0001$ ). The frequency of dyslipidaemia was 95% women and 87% men ( $p = 0.162$ ). Hypertension was the most common comorbid disease, and in men it was rare than in women (75% vs 91%,  $p = 0.011$ ). The incidence of diabetes was 20% and 12.5% in men and women ( $p = 0.284$ ). Risk stratification was carried out using the TIMI scale; men more often had high risk (68.8% vs 25% women;  $p < 0.0001$ ), and women – moderate risk (75% vs. 31.2% men,  $p < 0.0001$ ). Invasive coronary angiography was equally common in men and women (80% and 82.5%). PCI with BMS stenting was performed more often in men (78.8% vs 40%,  $p < 0.0001$ ). Drug treatment in men and women was identical (table).

**Conclusions:** Clinical features of ACS in men are younger age, more frequent development of ACS with ST-segment elevation and invasive approaches. There were no differences in drug treatment programs based on gender.

**Keywords:** acute coronary syndrome, men, women

Medications	Frequency of use in men	Frequency of use in women	p
anticoagulants	98.8%	95%	> 0.05
dual antiplatelet therapy	100%	100%	> 0.05
β-blockers	92.5%	93.8%	> 0.05
nitrates	100%	95%	> 0.05
ACE inhibitors	96.3%	97.5%	> 0.05
statins	100%	100%	> 0.05
calcium antagonists	37.5%	33.8%	> 0.05

Table 1. Drug treatment in men and women with ACS.

[Abstract:2230]

## DEAFNESS AND TAKAYASU'S ARTERITIS: AN UNUSUAL ASSOCIATION THAT SHOULD NOT BE IGNORED

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**Introduction:** Takayasu arteritis (TA) is a vasculitis of the large vessels affecting the aorta and its branches. This rare disease mainly affects women under the age of 50.

Hearing impairment in TA is often unrecognised and may include tinnitus, hypoacusis or even deafness. We report a case.

**Observation:** T.L, 32 years old, followed since 2016 for TA type II b, Diagnosis retained in front of: claudication of the left upper limb, anisotension, carotidodynia and left carotid murmur, the angio MRI of the TSA: parietal thickening of the thoracic aorta, the left subclavian and the left common carotid (LCCA).

Corticosteroid therapy at 1mg/kg/day was started in combination with methotrexate, with good initial progression.

A few months later, tinnitus in the left ear was reported, and an ENT examination revealed sensorineural hearing loss in the left ear; MRI of the rocks showed no abnormalities.

In 2022 she presented with a new attack of her AT associated with bilateral sensorineural hearing loss confirmed by audiogram, aortic CT angiography: an extension of the ASD lesions (significant stenosis of LCCA and thickening of truncus brachiocephalicus).

Given the recurrent nature of the deafness, which often coincided with attacks of AT, and the worsening of the lesions, the diagnosis of AT-related sensorineural hearing loss (SNHL) was raised. The patient received intra-auricular corticosteroid therapy combined with biotherapy (infliximab) with spectacular improvement.

**Conclusions:** Deafness during TA is a rare complication, and is a diagnostic and therapeutic emergency that should not be overlooked because of its impact on quality of life.

**Keywords:** takayasu arteritis (TA), tinnitus, hypoacusis, sensorineural hearing loss (SNHL), intra-auricular corticosteroid, biotherapy

[Abstract:2238]

## ATRIAL FIBRILLATION AND HYPOCOAGULATION - ARE OUR CHOICES THE RIGHT ONES?

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**Summary:** Oral anticoagulation is crucial in patients with atrial fibrillation (AF), given the higher risk of stroke occurrence or cardiovascular morbidity. However, there is still scarce information if patients are correctly hypocoagulated in Portugal.

**Purpose:** To evaluate if AF patients were correctly hypocoagulated and the prevalence of acute major cerebrovascular events among these patients.

**Methods:** A cross-sectional study was undertaken in a tertiary Portuguese hospital (2021-2023). Patients with previous history of AF admitted to internal medicine ward were included. Data was extracted from medical charts. To assess if patients were correctly hypocoagulated, we calculated CHA2DS2-VASc, assessed renal function (creatinine values and glomerular filtration rate), INR, and the type of OAC and doses. We have also estimated the prevalence of acute ischaemic stroke (IS) and acute transient ischaemic attack (TIA). Data analysis was performed using univariate statistics (IBM SPSS v.20.0).

**Findings:** A total of 168 patients were included, with a mean age of 77.2±8.2 years old and 55.4% (n=93) were female. 18.5% (n=31) of the sample was not on OAC, and of these 22.5% (n=7) were admitted in the medicine ward with an acute IS or TIA. Out of the hypocoagulated patients, 11.7% (n=16) were incorrectly hypocoagulated due to incorrect dose.

**Conclusions:** We observed that an important part of the sample who had AF were not hypocoagulated and near a quarter had an acute event (IS or TIA). These results show the need to introduce OAC in all patients despite their relative contraindications.

**Keywords:** atrial fibrillation, oral anticoagulation, acute cerebrovascular event

[Abstract:2250]

## A RARE CAUSE OF FLASH PULMONARY EDEMA

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Flash pulmonary edema (FPE) is a characteristic form of pulmonary congestion that manifests itself suddenly and constitutes around 3% of the clinical presentations of acute heart failure. Among its causes are myocardial ischemia, acute aortic or mitral insufficiency and hypertensive crisis due to bilateral renal artery stenosis or unilateral if only one functioning kidney.

We present a 77-year-old man with a history of heart failure with three episodes of FPE in the last year, with a recent echocardiogram presenting preserved left ventricular systolic function and coronary angiography without significant coronary disease. The patient also had chronic kidney disease with follow up in Nephrology consultation and a 50% left renal artery stenosis. He presented to the emergency department with another FPE, with the need for ventilatory support. He showed rapid improvement after medical therapy and non-invasive ventilation. The hypothesis of FPE was raised due to renal artery stenosis. He underwent angioplasty of the left renal artery. After the procedure, there were no new episodes of FPE.

FPE is a rare manifestation of renal artery stenosis, especially in

a patient with unilateral renal stenosis with bilateral kidneys. In a patient with recurrent episodes of FPE, renovascular hypertension due to renal artery stenosis should be suspected. Its diagnosis is confirmed after correcting the stenosis and improving control of the tension profile. Therefore, early diagnosis and treatment are crucial to avoid episodes of FPE, which are associated with high morbidity and mortality.

**Keywords:** flash pulmonary oedema, renal artery stenosis

[Abstract:2261]

## NOVEL SINGLE BIOMARKERS ACCURACY FOR DEATH PREDICTION SHOULD BE CAREFULLY INTERPRETED IN PATIENTS WITH ACUTE PULMONARY THROMBOEMBOLISM

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**Purpose:** Multiple prognosis methods have been developed to stratify patients with acute pulmonary thromboembolism (aPE). Recently, other biomarkers, such as platelet to haemoglobin ratio (PHR) has been associated with adverse events in this scenario. The authors aim to determine PHR applicability in a single-centre cohort.

**Methods:** Retrospective comparative study. All consecutive patients with aPE admitted to an internal medicine ward between 2019-2022 were included. PHR was calculated for every patient, and a ROC curve was developed to define the optimal cut-off value. Cox regression analysis was implemented to study the association between PHR and death. PESI score was used as a comparator.

**Findings:** Non-significant differences in PHR according to survival status were noted at 30-days ( $P=0.26$ ) and 1-year ( $P=0.59$ ). Optimal PHR cut-off was defined as 2.04 (AUC: 0.62; sensitivity: 84.6%; specificity: 48.1%). ESC mortality risk scores did not significantly differ between groups. All-cause mortality was 13.4% (20.5% low-PHR vs 3.6% high-PHR,  $P=0.045$ ; OR 0.144, 95%CI 0.018-1.149) and 26.9% (33.3% low-PHR vs 17.9% high-PHR,  $P=0.16$ ; OR 0.412, 95%CI 0.147-1.157) at 30-day and 1-year, respectively. PESI score was significantly associated with 30-day (OR 3.424, 95% CI 1.142-10.264, per class increase) and 1-year (OR 2.039, 95% CI 1.304-3.190, per class increase) mortality.

**Conclusions:** Single use of PHR to predict mortality in patients with aPE should be carefully interpreted in the light of the reduced and conflicting evidence, compared to the PESI score.

**Keywords:** pulmonary thromboembolism, platelet to haemoglobin ratio, PESI score

[Abstract:2268]

## RESTRATIFICATION OF CARDIOVASCULAR RISK BASED ON POINT OF CARE ULTRASONOGRAPHY IN PATIENTS DIAGNOSED WITH SYSTEMIC SCLEROSIS OR SYSTEMIC LUPUS ERYTHEMATOSUS

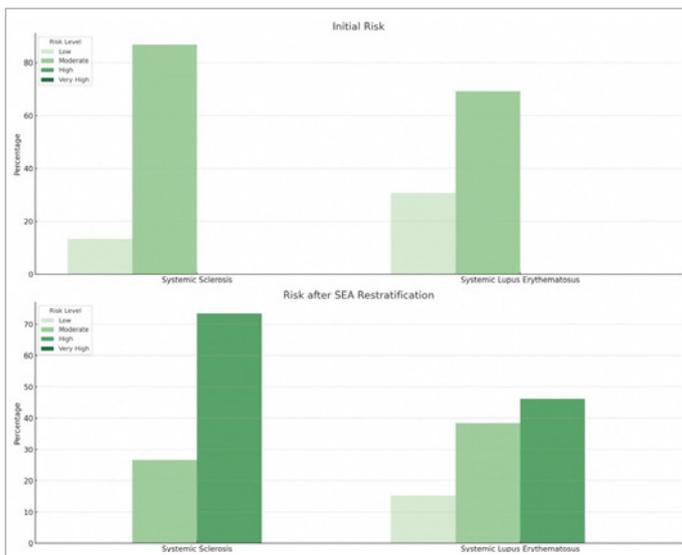
Paula Teresa López León, Antonio Zamora Chisvert, Santos Ibañez Barceló, Carlos Giner Laguarda, Victor Garcia-Bustos, Marta Dafne Cabañero Navalón, José Todolí Parra, Ana Isabel Renau Escrig

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The goal of the project is to analyse the use of point of care ultrasonography (POCUS) in the evaluation of global cardiovascular risk (CVR) in patients with systemic sclerosis (SSc) or systemic lupus erythematosus (SLE) with initially low or moderate risk by SCORE-2 and whether these findings imply a restratification of their CVR. Patients under 70 years old diagnosed of SSc or SLE with low or moderate CVR by SCORE-2 underwent a clinical questionnaire, anthropometric and blood pressure evaluation, full blood test and carotid, femoral, abdominal and cardiac POCUS performed by internal medicine residents trained in ultrasonography. Each case was evaluated using the Spanish Society of Arteriosclerosis (SEA) standards for CVR. 31 patients were included (15 SSc and 16 SLE). Initially 13,3% and 30,8% were classified as low and 86,7% and 69,2% as moderate CVR; and after our evaluation, 0% and 15,4% were classified as low, 26,7% and 38,7% as moderate, and 73,3% and 46,2% were reclassified as high CVR, respectively for the SSc and LES groups.

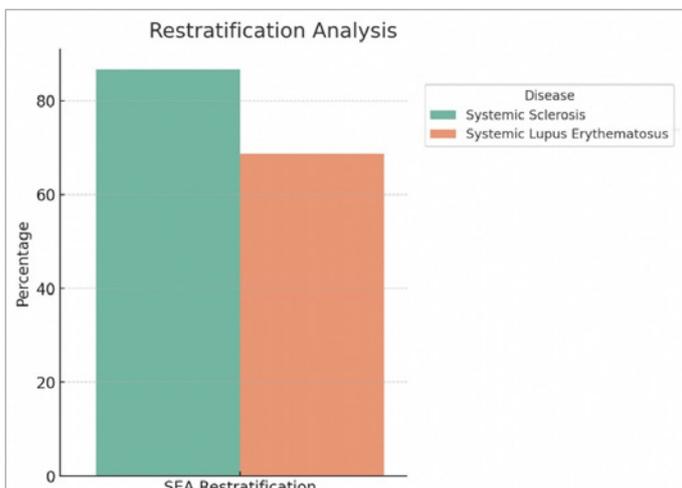
Following the SEA standards, 86,7% of patients with SSc and 68,8% of patients with SLE were restratified to higher CVR; of these, 69,2% and 54,5% respectively, were restratified due to abnormal ultrasound findings. A global CVR evaluation including POCUS may detect patients with higher CVR than the one estimated by SCORE-2, meaning these patients should have a lower LDL target and possibly need a change in drug treatment. This may be especially important in patients with underlying diseases such as SSc or SLE.

**Keywords:** cardiovascular risk (CVR), point of care ultrasonography (POCUS), systemic sclerosis (SSc), systemic lupus erythematosus (SLE)



**Figure 1.** Cardiovascular risk in SSc and LES groups before and after global risk evaluation including POCUS.

Initially, 13,3% and 30,8% were classified as low and 86,7% and 69,2% as moderate CVR; and after our evaluation (and according to SEA standards), 0% and 15,4% were classified as low, 26,7% and 38,7% as moderate, and 73,3% and 46,2% were reclassified as high CVR, respectively for the SSc and LES groups.



**Figure 2.** Cardiovascular risk restratification according to SEA standards.

Following the SEA standards, 86,7% of patients with SSc and 68,8% of patients with SLE were restratified to higher CVR. Of those patients restratified, more than half were due to abnormal ultrasound findings such as presence of carotid or femoral atheroma plaques or left ventricular hypertrophy by image.

[Abstract:2295]

## ONCE-WEEKLY SEMAGLUTIDE IN PATIENTS WITH TYPE 2 DIABETES, OBESITY, AND HEART FAILURE WITH PRESERVED LEFT VENTRICULAR EJECTION FRACTION

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**Background:** The efficacy of semaglutide in patients with type 2 diabetes, obesity, and heart failure with preserved ejection fraction have been analysed.

**Methods:** Observational and prospective study on patients who were consecutively treated with once-weekly semaglutide (Sema-Preserved Group), as well as on patients who did not receive semaglutide or other glucagon-like peptide-1 receptor agonists (control-preserved group). The primary outcome was the heart failure health status at 18 months. Secondary outcomes included the number of heart failure events cardiovascular death, hospitalizations, and nephropathy. Associations were evaluated using mixed effect logistic regressions.

**Results:** 139 patients were included in each group. A primary outcome event occurred in 60.4% patients in the sema-preserved group and 17.3% patients in the control-preserved group ( $p < 0.01$ ). There were significant reductions in the individual components of the composite outcome: Kansas City cardiomyopathy questionnaire total symptom score change ( $p = 0.012$ ), New York heart association classification ( $p = 0.023$ ), and NT-pro-BNP levels ( $p = 0.043$ ). There were also declines in the heart failure events ( $p < 0.01$ ), and hospitalizations ( $p = 0.041$ ). Semaglutide improved glycaemic control and reduced body weight at 18 months of follow-up.

**Conclusions:** Once-weekly semaglutide was associated with an improvement in heart failure health status in patients with type 2 diabetes, obesity, and heart failure with preserved ejection fraction. Also, there were also reductions in the composite outcome of heart failure events, and hospitalizations.

**Keywords:** semaglutide, type-2-diabetes, obesity, heart failure

[Abstract:2314]

## COMPARISON BY GENDER OF PROBNP AND LEFT VENTRICLE EJECTION FRACTION (LVEF) IN PATIENTS FOLLOWED-UP IN CHRONIC HEART FAILURE (CHF) PROGRAM IN A MODEL 3 HOSPITAL IN IRELAND

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CHF has an incidence of 3.2 per 1000 people in Europe and a prevalence of 2% rising to 10% in those >75 years in Ireland. There is a establish program in our model 3 hospital for follow-up practice that includes virtual and in-person monitoring by trained nursing staff and with Cardiology with the aim of improving quality of life and treatment compliance.

**Methods:** Medical Records of patients included in the CHF program from January to June 2023. Data was gathered using S2P2.

**Results:** After reviewing an original sample of 146 patient's records, we selected a total of 99 to work on. Most of the other records were discarded because of inaccessibility to the total information. There were 28 (28.28%) female and 71 male (71.71%). The average age was 72.2 in total, 73.25 for women and 71.81 for men. Left ventricle ejection fraction (LVEF) assessed by TTE was on average 35.14 in total, 36.14 for women and 34.66 for men. ProBNP mean was 1069.63 in total, for women 1075.07 and for men 1067.49. The highest female proBNP was 8753 while the male one was 15660. The lowest LVEF was for women 18% and for men 10%.

**Conclusions:** CHF is becoming more prevalent and intervention following the guidelines is paramount. There is an almost 4-fold higher incidence of this pathology in male. There were no clear differences between the sexes in LVEF and proBNP in our data. This data must call for stakeholders to design more focused preventative gender-based intervention in this disease.

**Keywords:** heart failure, ejection fraction, echocardiogram, LVEF, proBNP, gender comparison

[Abstract:2324]

## DESCRIPTION OF ANALYTICAL AND IMAGING FEATURES IN PATIENTS DIAGNOSED WITH NON-MUTATED TRANSTHYRETIN AMYLOIDOSIS (ATTRWT) AT A SECONDARY LEVEL HOSPITAL IN SPAIN

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**Objectives:** Describe analytical and imaging features of patients diagnosed with cardiac amyloidosis due to non-mutated transthyretin (ATTRwt).

**Materials and Methods:** Patients diagnosed with cardiac amyloidosis in Internal Medicine department from October 2017 to May 2022, were included. The diagnosis of ATTRwt was established based on the presence of abnormalities in ECG, echocardiogram, or cardiac magnetic resonance imaging (MRI), positive 99mT-DPD scintigraphy with a Perugini grade  $\geq 1$ , absence of monoclonal gammopathy, and absence of mutations in the TTR gene. For left ventricular ejection fraction (LVEF), we considered LVEF reduced if  $\leq 40\%$ , slightly reduced if 41-49%, and preserved if  $\geq 50\%$ .

**Results:** Fourteen patients were analysed, with a mean age of 83.9 years, all of them males. Echocardiography was performed in all patients, with slightly reduced LVEF in 35.7% and preserved in the rest, none of them had reduced LVEF. The thickness of the interventricular septum (IVS) was 17.55 mm. 99mT-DPD scintigraphy was performed in 13 out of 14 patients, with Perugini grade 1 in 28.57%, grade 2 in 42.85%, and grade 3 in 21.42%. MRI was performed in 2 patients. Electrocardiogram (ECG) showed low QRS voltages in 64.28% and pseudo-Q pattern in 35.71%. Median ProBNP was 8692. The mean troponin T level at diagnosis was 84.5 ng/mL.

**Conclusions:** Patients with ATTRwt in our department have advanced age, all are males. There is a predominance of preserved LVEF. The IVS is significantly increased above diagnostic criteria. The most common ECG abnormality was low QRS voltages, observed in one-third of the patients.

**Keywords:** diagnosis, transthyretin amyloidosis wild type, left ventricular injection fraction

[Abstract:2336]

## A CASE OF INFECTIVE ENDOCARDITIS IN A CHRONIC HAEMODIALYSIS PATIENT

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**Case Description:** A 41-year-old female patient diagnosed with diabetes and chronic kidney disease applied to the emergency with fever and confusion after her haemodialysis session. At the time of admission, she was hypotensive and her acute phase reactants were found to be high. After cultures were taken empiric antibiotic therapy was started on the patient. Physical examination of the patient revealed widespread painless erythematous rashes all over his body and Janeway lesions on the soles of her feet.

**Clinical Hypothesis:** Infective endocarditis (IE) in a chronic haemodialysis patient

**Diagnostic Pathways:** *Staphylococcus aureus* growth was observed in consecutive blood cultures and catheter tip culture. No vegetation was seen in the transthoracic echo, but as high clinical suspicion remained transoesophageal echocardiography performed and revealed vegetation measuring 6.2 mm on the

aortic valve and vegetation extending from the tip of the central venous catheter to the right atrium. Nevertheless, an operation was planned by the cardiovascular surgeons after follow-up echocardiography showed no decrease in vegetation size. Discussion and learning points:

Infective endocarditis (IE) is a serious infectious condition with high morbidity and mortality in patients with end-stage renal disease (ESRD). It has been particularly associated with recurrent bacteraemia due to vascular access via lumen catheters.

**Keywords:** infective endocarditis, haemodialysis, Janeway lesions



Figure 1. Diffuse haemorrhagic skin lesions on the trunk.



Figure 2. Haemorrhagic rashes on the face.



Figure 3. Janeway lesions on the soles of the feet.

[Abstract:2347]

## GALECTIN LEVEL 3 IN PATIENTS WITH CHD

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Recently, an actively studied biomarker is galectin-3, used in laboratory diagnostics as a marker of tumour transformation and a biomarker of CHF.

**Aim:** Evaluation of the clinical and prognostic significance of galectin-3 in patients with CHD with obesity and without.

**Methods:** 47 patients were examined who were diagnosed with CHD with obesity and without. On the 1<sup>st</sup>-2<sup>nd</sup> day of the disease, the level of galectin-3 was determined by the enzyme immunoassay in all patients.

**Results:** The concentration of galectin-3 in patients without obesity was 7.5 [5.2; 10.1] ng/ml, in patients with obesity level of this biomarker increased and reached 10.6 [9.2; 44.3] ng/ml. There were ( $p = 0.04$ ) higher concentrations of galectin-3 in patients with 2 grade of obesity compared with patients with 1 grade. In patients with a history of hypercholesterolemia, the level of galectin-3 was 47% higher ( $p=0.0002$ ) compared with patients without it.

**Conclusions:** The results of this work showed the possibility of using the galectin 3 level for risk stratification of patients with CHD and obesity. Despite a large number of experimental and clinical studies of galectin 3, some questions remain unanswered and require more detailed and in-depth analysis.

**Keywords:** CHD, galactic-3, obesity

[Abstract:2355]

**CONSTRICTIVE PERICARDITIS, A CLINICAL CASE**

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Acute pericarditis is characterized by chest pain, pericardial friction rub, diffuse ST segment elevation and pericardial effusion. Most cases are idiopathic or result from viral infections; treatment includes non-steroidal anti-inflammatory drugs, colchicine, or corticosteroids. Constrictive pericarditis results from the loss of pericardial compliance with clinical manifestations arising from right heart failure. Can be idiopathic, viral, or iatrogenic. Treatment is directed at the underlying cause and heart failure. A 68-year-old woman with NYHA class II heart failure and a history of left breast cancer treated with radiotherapy, chemotherapy, and mastectomy 42 years ago. Presented to the emergency department with fatigue, left dorsal chest pain radiating to the back, cough and rhinorrhoea for 4 days. On examination: fever, jugular vein distention. Laboratory tests: C-reactive protein 15.2 mg/dL and D-dimers 3.18 mg/DI; chest X-ray: cardiomegaly; electrocardiogram: sinus tachycardia. CT showed pericardial effusion with thickening and enhancement of pericardial layers suggestive of pericarditis. There were radiation-induced lung parenchymal changes in the upper lobe, diffuse atherosclerotic disease, and a parietal thrombus in the distal aortic arch/proximal descending thoracic aorta. Was referred to vascular surgery and started anticoagulation. Due to suspected acute pericarditis, started ibuprofen and colchicine. Echocardiographic study suggested constrictive pericarditis: left ventricular akinesia of apical segments with compromised ejection fraction. Cardiac catheterization excluded coronary artery disease and showed diastolic pressure curves with a characteristic “square root” pattern of constrictive pericarditis. The etiological study was inconclusive. Constrictive pericarditis was assumed to be a consequence of prior radiotherapy for left breast cancer, with concurrent acute pericarditis.

**Keywords:** pericarditis, constrictive pericarditis, cancer

[Abstract:2366]

**DETERMINATION OF VITAMIN D LEVELS IN PATIENTS WITH CORONARY HEART DISEASE AND TYPE 2 DIABETES MELLITUS**

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**Background:** Coronary heart disease (CHD) occupies a leading position among all chronic non-communicable diseases. The main substrate for the development of coronary artery disease is coronary atherosclerosis, but today special attention is paid to new aspects of the formation of coronary atherosclerosis.

The aim of the study is to assess the relationship of vitamin D levels with the severity of type 2 diabetes mellitus in patients with coronary heart disease during prospective follow-up.

**Methods:** Vitamin D levels were determined in blood serum samples during the initial examination of all participants (40 people) by ELISA.

In patients with coronary heart disease with type 2 diabetes, vitamin D levels were statistically significantly lower compared with patients without diabetes. Vitamin D levels also affected the frequency of hypoglycaemic conditions in patients with type 2 diabetes and coronary heart disease: the lower the vitamin D level, the more often hypoglycaemia was. In the population with the lowest vitamin D levels, there was an increased relative risk (RR) of complications of diabetes mellitus by 2.12 (95% confidence interval (CI) 1.67–2.98) adjusted for age and gender. The association between low vitamin D levels and diabetes mellitus is statistically significant ( $p=0.05$ ).

**Conclusions:** low vitamin D levels are largely associated with the risk of type 2 diabetes complications. Hypovitaminosis D may be an important risk factor for the development of type 2 diabetes complications in patients with coronary heart disease, which requires further study.

**Keywords:** CHD, vitamin D, diabetes mellitus

[Abstract:2381]

**RELATIONSHIP OF LIPOPROTEIN(A) AS A SHORT-TERM PROGNOSTIC FACTOR IN PATIENTS WITH HEART FAILURE**

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**Objective:** Describe the association between lipoprotein a values with the characteristics, comorbidities, aetiology, prognosis and short-term mortality in patients with decompensated heart failure (HF).

**Materials and Methods:** Prospective observational study. Patients who were admitted to the Internal Medicine Service of the San Pedro Hospital between July 2022 and January 2023 with a diagnosis of decompensated HF, were included. Admission blood tests were requested with lipoprotein a values and previous cardiac status, demographic variables and comorbidities were recorded.

**Results:** A total of 66 patients were analysed, including 35 (53.03%) males, with a mean age of  $84\pm 7.8$  years. Most patients had NYHA functional class II-III (81.8%). The majority had a history of hypertension (87.9%) and known dyslipidaemia (45.5%). A small proportion were smokers (4.6%) and had diabetes (33.3%). The most common aetiology of HF was hypertension (34.9%), with preserved left ventricular ejection fraction (LVEF) observed in the majority (76%). During the 6-month follow-up, 21 patients died (31.8%), 19 experienced HF decompensation (41.3%), and 6 had a thrombotic event (9.1%). A relationship was observed between lipoprotein(a) levels in patients with preserved LVEF and thrombotic events during the follow-up period, as shown in table 1.

**Conclusions:** In our sample, lipoprotein(a) levels were associated with short-term thrombotic events and the presence of LVEF greater than 50%. Although no relationship was observed with aortic stenosis or worse cardiac prognosis in patients with HF, it does appear to be related in patients with moderate or severe aortic stenosis.

**Keywords:** lipoprotein a, decompensated heart failure, prognosis, comorbidities, mortality

Age (years), mean $\pm$ DE	84 $\pm$ 7.9	84 $\pm$ 7.8	ns
Sex (Man), n (%)	25 (53.2%)	10 (52.6%)	ns
Dyslipidaemia, n (%)	20 (42.6%)	10 (52.6%)	ns
Atrial fibrillation, n (%)	30 (63.8%)	13 (68.4%)	ns
Aortic stenosis, n (%)	4 (8.5%)	3 (15.8%)	ns
Moderate or severe aortic stenosis, n (%)	3 (6.4%)	3 (15.8%)	0.02
LVEF, media $\pm$ DE	53.4 $\pm$ 14.4	53.5 $\pm$ 14.3	0.03
Thrombotic event, n (%)	2 (4.3%)	4 (21.1%)	0.03
Decompensated heart failure, n (%)	15 (31.9%)	4 (21.1%)	ns
Mortality, n (%)	13 (27.7%)	8 (42.1%)	ns

**Table 1.** Comparison of characteristics and comorbidities between patients with lipoprotein(a) above and below 30.

A relationship was observed between lipoprotein(a) levels in patients with preserved LVEF and thrombotic events during the follow-up period, as shown in table 1.

[Abstract:2396]

## FALLING FOR YOU - SUBCLAVIAN STEAL SYNDROME AS CAUSE OF REPEATED SYNCOPES

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Subclavian steal syndrome is the phenomenon of inverted blood flow in the vertebral artery, caused by occlusion of the proximal subclavian artery, commonly due to atherosclerosis. Consequently, cerebral blood supply is decreased, which can lead to episodic neurological symptoms. Diagnosis is made through echo-doppler and CT angiography and classified according to the severity of the hemodynamic changes into grades 1 to 3.

We present the case of a 71-year-old woman observed in the emergency department due to recurrent episodes of syncope in the previous 2 weeks. Usually triggered by standing, without prodrome or other changes, and with spontaneous recovery in minutes. Head CT was normal. During hospitalization, an important blood pressure difference was noted between the arms (over 30 mmHg), as well as asymmetric pulses. She underwent CT angiography revealing “calcified atheromatosis of the aortic arch involving the emergence of the left subclavian artery, associated with occlusive plaque in the proximal and distal portions of the same left subclavian artery, with apparent total occlusion”, as well as echo-doppler showing complete inversion of flow in the left vertebral artery - compatible with grade 3 subclavian steal syndrome. Alternative etiologies, namely cardiac and arrhythmic, were excluded. The patient was referred to vascular surgery for a carotid-subclavian bypass.

Subclavian steal syndrome is an uncommon entity but should be excluded in the presence of unexplained episodic neurological phenomenon. Additionally, it should always be suspected when in the presence of a significant differential in blood pressure between the arms or signs of poor perfusion in an upper limb.

**Keywords:** subclavian steal, syncope, neurological disorder

[Abstract:2406]

## IS THE CARDIOVASCULAR RISK HIGHER IN DIABETIC PATIENTS WITH MAFLD THAN IN THOSE WITHOUT MAFLD?

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**Introduction:** Recently, the experts, have changed the nomenclature from non-alcoholic fatty liver disease (NAFLD) to metabolic dysfunction associated fatty liver disease (MAFLD). MAFLD patients might have a greater cardiovascular risk and that MAFLD itself might confer a higher cardiovascular risk.

**Materials and Methods:** We have studied a group of 77 diabetic patients, with and without MAFLD, who were hospitalized in the Diabetes Department, during a three month period. For evaluating the cardiovascular risk, we have used the UKPDS risk engine. Liver fibrosis was non-invasively assessed by the Forns index.

**Results:** From the whole group, 23 patients (29.87%) were diagnosed with MAFLD. The average age was 60.7 years in the group without MAFLD and 66.9 years in the MAFLD group ( $p=0.0019$ ). The cardiovascular risk at those without MAFLD was: 22.01% for coronary heart disease, 15.8% for fatal coronary heart disease, 7.6% for stroke and 1.3% for fatal stroke, comparing with those with MAFLD, who presented the following risks: 33.02% for coronary heart disease ( $p=0.0118$ ), 26.81% for fatal coronary heart disease ( $p=0.0206$ ), 15.91% for stroke ( $p=0.0017$ ) and 2.86% for fatal stroke ( $p=0.0059$ ). By correlating the liver fibrosis with the cardiovascular risk in MAFLD group, we have found a tight linear correlation between the liver fibrosis score and the 10 years risk of developing stroke ( $r=0.334$ ) and fatal stroke ( $r=0.325$ ).

**Conclusions:** Diabetic patients with MAFLD have a significantly higher risk of developing cardiovascular than those without MAFLD. Liver fibrosis in diabetic patients with MAFLD is well correlated with the cardiovascular risk.

**Keywords:** cardiovascular risk, liver fibrosis, metabolic syndrome

[Abstract:2424]

## PERSISTENCE AND MODIFICATIONS AT 3 YEARS OF ANTICOAGULANT TREATMENT IN A COHORT OF PATIENTS WITH ATRIAL FIBRILLATION INITIATING TREATMENT WITH VITAMIN K ANTAGONISTS

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**Objective:** Describe persistence and modifications of oral anticoagulant treatment with vitamin K antagonists (VKA) in patients with atrial fibrillation (AF) over a 3-year period.

**Materials and Methods:** A random sample was selected from all patients included in the TAONET® database with a diagnosis of AF who initiated VKA treatment in 2016. Epidemiological and clinical

data were recorded at the start of treatment. The anticoagulant treatment of each patient was recorded at the 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> year of treatment.

**Results:** A total of 100 patients were analysed, 45.45% female, mean age  $77.83 \pm 8.94$ . Charlson Index  $4.92 \pm 2.01$ , CHA2DS2-VASc:  $3.74 \pm 1.52$ , with 92.11% score  $>2$ , HAS-BLED:  $1.84 \pm 0.73$ . 26% of patients were lost to follow-up. 20% died during the study period. The persistence of VKA treatment was 68.51%, with a mean time in therapeutic range (TTR) in the last year of  $61.9 \pm 23.8$ . Table 1 shows the persistence and modifications of anticoagulant treatment stratified annually up to the 3<sup>rd</sup> year.

**Conclusions:** The persistence of oral anticoagulant treatment with VKA in AF observed in our cohort is 68.51%, higher than what is reported in the literature, with particularly high persistence in the first year. There is a progressive increase in the use of direct oral anticoagulants (DOACs). The TTR of patients who persist with VKA is higher than reported in observational studies. The percentage of patients maintaining any form of oral anticoagulant treatment is 96%, much higher than in previous studies. All of this suggests improved adherence and control of anticoagulant treatment in contemporary AF.

**Keywords:** atrial fibrillation, anticoagulant, vitamin K antagonists, direct oral anticoagulants, therapeutic range

	1 <sup>o</sup> year	2 <sup>o</sup> year	3 <sup>o</sup> year
Exitus (n, %)*	11 (11%)	16 (16%)	20 (20%)
Alive (n, %)*	63 (63%)	58 (58%)	54 (20%)
Loss of follow-up (n, %)*	26 (26%)	26 (26%)	26 (26%)
VKA (%)**	82.54%	74.14%	68.51%
DOAC (%)**	15.87%	22.41%	27.78%
LMWH (%)**	0	1.72%	1.85%
Antiaggregant (%)**	0	0	0
No treatment (%)**	1.59%	1.72%	1.85%

**Table 1.** Persistence and modifications of anticoagulant treatment stratified annually up to the 3<sup>rd</sup> year. \* Cumulative data. \*\* % over the patients still alive at that moment. DOAC: direct oral anticoagulant. LMWH: low molecular weight heparin.

[Abstract:2436]

## ORTHODEOXIA-PLATYPNEA SYNDROME IN THE INTENSIVE NEUROREHABILITATION UNIT: THE CRUCIAL ROLE OF COMANAGEMENT

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**Case Description:** A 67-year-old woman was admitted to the Intensive Neurorehabilitation Unit following a post-trauma cerebral haemorrhage induced by an ischemic stroke. Her medical history included the presence of transient ischemic attacks and an atrial septal aneurysm. The patient had a tracheostomy and was on invasive mechanical ventilation. Oxygen saturation worsened in the seated position and improved in the supine position.

**Clinical Hypothesis:** We investigated the causes of respiratory failure, subsequently discussing potential diagnostic hypotheses with the referring colleagues, including the deterioration of the patent foramen ovale (PFO), assessed as non-operable in the acute phase.

**Diagnostic Pathways:** The transthoracic echocardiogram confirmed the presence of an atrial septal aneurysm. The patient underwent transoesophageal echocardiography, revealing a worsening extension of the PFO. The bubble test confirmed the presence of a PFO with right-to-left microbubble flow. Transcatheter closure of the PFO was performed. Post-procedure saturation tests revealed normal arterial oxygen saturation in both supine and sitting positions, with no need for supplemental oxygen. The patient was successfully weaned from the ventilator and decannulated 48 hours later.

**Discussion and Learning Points:** The physiological mechanism responsible for the right-to-left shunt induced by postural changes in patients with a PFO still requires further study. The right-to-left shunt could have been caused by the recent pulmonary embolism during the post-acute hospitalization, resulting in the modification of intracardiac pressures. The possibility of coordination with the referring unit has facilitated the arrival at a complex diagnosis, improved prognosis, and reduced the costs associated with prolonged hospitalization.

**Keywords:** orthodeoxia-platypnea syndrome, patent foramen ovale (PFO), complex diagnosis, neurorehabilitation unit

[Abstract:2445]

## ACUTE ARTERIAL ISCHEMIA – THE ROLE OF COMORBIDITIES IN THE THERAPEUTIC STRATEGY

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**Objective:** Acute limb ischemia is a medical and surgical emergency characterized by a rapidly progressive clinical evolution, marked by the swift or sudden interruption of arterial perfusion, threatening tissue viability. It is primarily caused by embolism and thrombotic occlusion. Promptly instituted treatment, the selection of operable cases, and long-term anticoagulant therapy constitute the main therapeutic arsenal.

**Materials and Methods:** We present the case of a 75-year-old patient known for cardiovascular, metabolic, and oncological pathology, under chronic oral anticoagulant treatment. The patient was admitted with cyanosis and pain in the fifth finger of the left hand, with an onset of approximately one week, accompanied by pain in the right leg.

**Results:** The interdisciplinary consultation of vascular surgery and cervico-thoracic angio-CT revealed focal stenosis of the left subclavian artery, parietal thrombus posterior to the descending thoracic aorta, and an aneurysmal dilation of the left subclavian vein. Considering the peripheral location of ischemia, a conservative treatment approach was chosen, with favourable progress. The thrombophilic profile detected a deficiency of protein S and hyperhomocysteinemia. After 6 months, the patient presented to the emergency department with minimal pain symptoms in the left upper limb. A cervico-thoracic CT examination revealed staged stenoses in the proximal portion of the left subclavian artery, leading to carotid-subclavian bypass.

**Conclusions:** The management of arterial disease is complex, with a major objective being the improvement of the patient's quality of life through the remission/improvement of the painful syndrome, as well as the preservation of the viability of the affected limb.

**Keywords:** peripheral arterial disease, anticoagulant treatment, limb viability

[Abstract:2448]

## THE LAST DROP MAKES THE CUP RUN OVER: EXPLORING A RARE AETIOLOGY OF RIGHT VENTRICULAR FAILURE

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A 55-year-old male presented to the ER with exertional dyspnoea and oedema that began six months before admission. Previous echocardiogram revealed mild tricuspid regurgitation with bi-atrial enlargement. An Abdominal ultrasound revealed dilation of the inferior vena cava, ascites, no bile duct dilation, and a right polycystic kidney.

In the emergency room, he had mild renal insufficiency, increased bilirubin, with normal white blood cell count and electrolyte. Echocardiography demonstrated severe right atrial dilation (55 cm<sup>2</sup>), tricuspid regurgitation, and dilation of the main pulmonary artery trunk. Dynamic parameters were consistent with a hyperdynamic circulation. Chest CT scan ruled out primary pulmonary diseases or signs of chronic pulmonary embolism.

After admission to internal medicine, diuretic therapy caused rapid improvement of symptoms. An abdominal CT scan, requested to investigate the causes of the hyperdynamic circulation, revealed a high-flow arteriovenous fistula of the right renal artery and vein, with multiple collaterals; confirmed by angiography. Multiple attempts to correct the fistula with endovascular stents proved unsuccessful. Eventually, the patient underwent open surgery, including fistulectomy and nephrectomy. Following the procedure, the hyperdynamic state was rapidly resolved, obtaining normal pressure values in the right heart. The patient had several complications including pulmonary embolism, intestinal ischemia requiring a colostomy, and septic shock. Finally, he was discharged after rehabilitation.

This case highlights a rare cause of RVF with hyperdynamic circulation, likely of congenital origin, which went undetected until fluid overload began affecting the patient's well-being. The vascular anomaly was initially mistaken for a polycystic kidney, a common finding in abdominal ultrasound.

**Keywords:** right ventricular failure, echocardiography, vascular disease, pulmonary hypertension

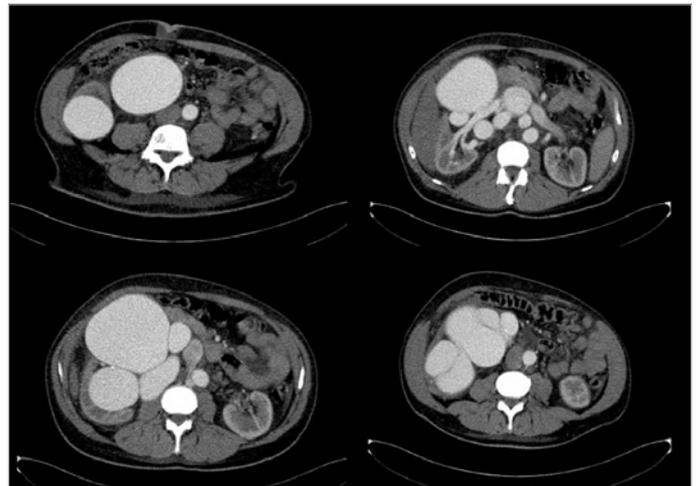


Figure 1. CT-scan HFVAF.

High flow veno arterious fistula with massive dilation of the inferior vena cava and multiple collaterals.

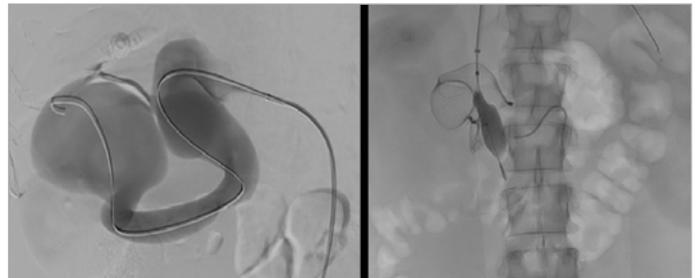


Figure 2. HFVAF angiography.

HFVAF of the right kidney with large collaterals (left) Intravascular stenting to close the fistula (right).

[Abstract:2454]

## STEMI TREATMENT IN PATIENTS 90+ YEARS – SINGLE CENTRE EXPERIENCE

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The incidence of ACS increases progressively with aging, being the main cause of mortality and morbidity in this population.

The aim was to compare in-hospital and long-term outcomes in pts with MI over 90 years of age, depending on the management strategy.

The design of the study was retrospective, single-centre. Since 01/2013 till 12/2020, 183 pts 90 years and older had been hospitalized to our centre with a diagnosis of MI (average age 91.7 years (90-100), 71.6% women). They were divided into two groups - conservative or invasive. Group 1 consisted of patients on OMT only (n=146), average age 91.8 (90-100) years, 107 (73.3%) women. The group 2 included pts, who underwent coronary angiography and, if indicated, PCI (n=37), average age 91.1 (90-96) years, 24 (64.9%) women.

Both groups were similar according to main characteristics. In-

hospital mortality among pts with MI aged 90 years and older was higher in the OMT group compared with the invasive strategy group - 36.3% versus 10.8% ( $p=0.003$ ). Mortality within a year after discharge from the hospital was 30.8% (45 pts) in the OMT group and 32.4% (12 patients) in the invasive management group ( $p=0.85$ ). As a result, 98 pts (67.1%) died in the OMT group, while 16 (43.2%) died in the invasive treatment group ( $p=0.007$ ). Advantages of invasive strategy of MI treatment in pts older than 90 years were observed during in-hospital period only.

**Keywords:** STEMI, PCI, reperfusion, older age, outcomes, nonagenarians

[Abstract:2466]

## THE INFLUENCE OF THE APOE GENE ON THE LIPID SPECTRUM AND THE CLINICAL MANIFESTATIONS OF MYOCARDIAL INFARCTION AND DIABETIC NEPHROPATHY

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**Objective:** Impact the assessment of APOE genes throughout myocardial infarction (MI) in patients with diabetic nephropathy (DN).

**Materials and Methods:** an examination of 185 patients treated for MI in 2019: men 60.5%, women 39.5%. Average age  $64.1 \pm 4.2$  years old. The first group (I) consisted of 93 patients with MI and DN, the second group (II) consisted of 92 people with MI without DN. Polymorphism of the APOE gene (rs769452) was evaluated. During the first three days, total cholesterol (TC) and low-density lipoproteins (LDL) were measured for all patients.

**Results:** The heterozygous LeuPro genotype was statistically more often determined in patients with MI and DN (group I) than in the comparison group II as well as high values of TC  $6.0 \pm 0.3$  mmol/l and LDL  $3.4 \pm 0.2$  mmol/l were detected in the group I than in the group II ( $5.0 \pm 0.3 / 2.4 \pm 0.3$ ),  $p < 0.05$ . Acute heart failure (AHF) of Killip classes III-IV happened 2.8 times more often in the group I,  $p < 0.05$ . Relapses of acute coronary syndrome (ACS) occurred 3 times more often in group I - 14.0%, versus 4.4% in group two,  $p < 0.05$ . Hospital mortality: I - 11.8%, II - 5.4%,  $p < 0.05$ .

**Conclusions:** 1) The heterozygous type of inheritance of the (Leu28Pro) APOE gene, which potentiates hyperlipoproteinemia, was statistically more often determined in patients with MI and DN. 2) The clinical course of MI in the group with DN, against the background of genetically determined hyperlipidaemia, and possibly in association with it, was characterized by larger number of complications: AHF, relapses of ACS and deaths.

**Keywords:** myocardial infarction, diabetic nephropathy, dyslipidaemia, APOE gene

[Abstract:2476]

## DON'T FORGET THE OTHER HALF

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The patient was a 60-year-old man with a history of smoking, hypertension, and pre-diabetes. He was under consultation for chronic liver disease due to hepatitis C virus and CDC HIV C3 infection with good immuno-virological control. On treatment with rilpivirine/darunavir-cobicistat 50/25 mg/day, enalapril 20 mg/day and atorvastatin 20 mg/day. He reported episodes of pain and numbness in both upper limbs on exertion. The examination revealed differences in blood pressure in both upper limbs in repeated measurements (BP 80/65 mmHg in the right arm; BP 132/84 mmHg in the left arm). Cardiopulmonary auscultation without findings and heart rate 82 bpm. Absent right axillary pulse with weak right humeral and radial pulses. No signs of acute ischaemia. A Doppler ultrasound was performed with the finding of critical stenosis prior to the exit of the vertebral artery with clear reversal of flow in systole and diastole with an ultrasound image that looks like a "shock wave". Subsequently confirmed in angio-CT with a decrease in the lumen of 80% of the subclavian artery, being referred to vascular surgery, not being a candidate for interventional treatment and carrying out a strict control of cardiovascular risk factors. In conclusion, simultaneous measurement of blood pressure in both upper limbs should be considered as a priority measure in the physical examination of a patient with hypertension, not only for the diagnosis of subclavian artery stenosis, but also because it is a marker of CVR and peripheral arterial disease at other levels.

**Keywords:** HIV, cardiovascular risk, subclavian stenosis



Figure 1. 3D volumetric reconstruction showing a critical stenosis of the right subclavian artery prior to the outflow of the vertebral artery.



Figure 2. Coronal reconstruction showing a critical stenosis (white arrow) of the right subclavian artery prior to the outflow of the vertebral artery.

[Abstract:2487]

## ANEMIC SYNDROME IN HEART FAILURE – A PERMANENT CHALLENGE

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**Introduction:** Iron deficiency and anaemia are recognized as comorbid conditions that influence the negative evolution and prognosis of patients with heart failure. The cause of anaemia should be continuously sought, but in many heart failure patients, a specific cause cannot be detected.

**Materials and Methods:** We present the case of a 75-year-old patient with a history of streptococcal tonsillitis in childhood, diagnosed at the age of 45 with rheumatic mitro-aortic disease. The patient underwent surgery at the age of 53, where a metal prosthesis was implanted in the aortic position, mitral valvuloplasty, and tricuspid annuloplasty. The patient is known to have atrial fibrillation since the age of 53, with progressive evolution to dilated cardiomyopathy and heart failure. The patient was hospitalized in a severe condition, showing signs and symptoms of global cardiac dysfunction.

**Results:** Investigations confirmed the severity of valvulopathy with significant echocardiographic dynamics disorders. However, the aortic valve prosthesis functioned normally, coexisting with severe cardiac stasis, limiting mobilization. Biologically, normocytic hypochromic anaemia, hyposideremia, a low value of ferritin. Under sustained treatment, improvement in cardiac decompensation and the haematological profile was achieved, along with an increase in exercise tolerance.

**Conclusions:** Anaemic patients exhibit severe symptoms of heart failure, a poor functional status, a high risk of hospitalization for heart failure symptoms, and reduced survival. The 2021 ESC Heart Failure Guide recommends investigating iron status and correcting iron deficiency, regardless of the presence of anaemia, with numerous studies confirming increased exercise tolerance and improved quality of life for heart failure patients.

**Keywords:** iron deficiency, heart failure, quality of life

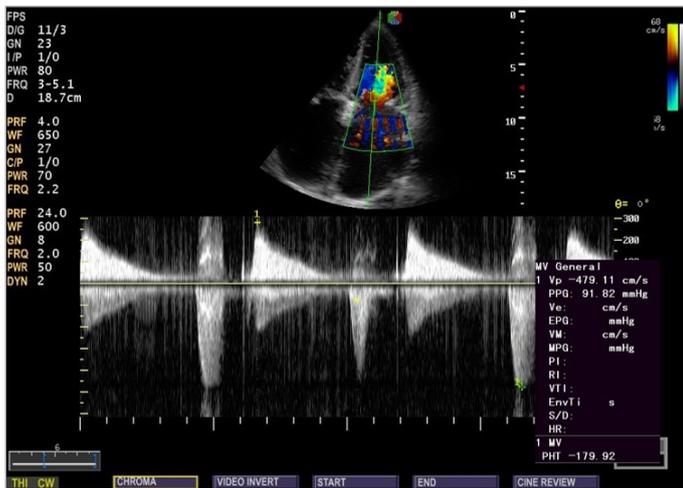


Figure 1. Cardiomyopathy.

[Abstract:2495]

## CLINICAL CHARACTERISTICS AND PROGNOSTIC IMPACT OF ATRIAL FIBRILLATION AMONG OLDER PATIENTS WITH HEART FAILURE WITH PRESERVED EJECTION FRACTION HOSPITALIZED FOR ACUTE HEART FAILURE

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**Purpose:** Heart failure with preserved ejection fraction (HFpEF) and atrial fibrillation (AF) are often coexisting conditions, but their interrelationship has not yet been clarified. This study investigated the clinical characteristics and prognostic impact of AF among older patients with HFpEF hospitalized for acute HF (AHF).

**Methods:** The study included patients 65 years of age and older who were admitted to the emergency department due to AHF from 1 January 2016 to 31 December 2019. Patients were divided into two groups according to the presence of AF and were followed up 90 days after hospital discharge. The primary endpoint was all-cause, in-hospital mortality.

**Results:** Overall, 770 patients with HFpEF were included, mean age 82 years, 53% were females. Nearly a third (30%) of these patients had a concomitant AF and they were significantly older and had higher NT-proBNP values. Overall, in-hospital mortality rate was much higher among HFpEF patients with AF compared to those without AF (11.4 % vs 6.9%, respectively;  $p=0.037$ ). At multivariate analysis, AF emerged as an independent risk factor

for death (OR 1.73 [1.03 – 2.92];  $p=0.038$ ). A total of 157 patients (20%) were readmitted within 90-days, but neither AF nor other comorbidities resulted associated with increased risk.

**Conclusions:** Among older patients with HFpEF admitted for AHF, coexistence of AF was associated with a nearly two-fold increased risk of all-cause, in-hospital mortality, but it did not impact hospital readmission.

**Keywords:** atrial fibrillation, heart failure with preserved ejection fraction, acute heart failure, mortality, older patients

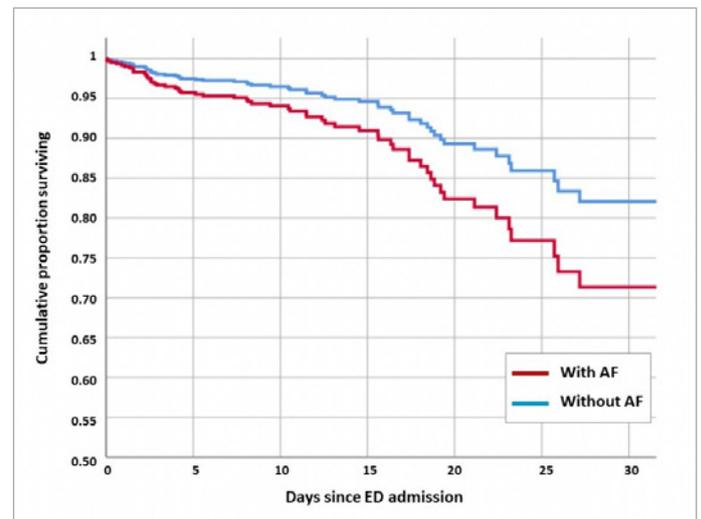


Figure 1. Cumulative proportion of survival in patients with HFpEF hospitalized for AHF with and without AF. Once corrected for clinical characteristic and comorbidities, AF emerged as an independent risk factor for all-cause, in-hospital death (OR 1.73 [1.03-2.92];  $p=0.038$ ).

[Abstract:2539]

## ANALYSIS OF THE DEVELOPMENT OF FATAL AND NON-FATAL CASES OF MYOCARDIAL INFARCTION IN PATIENTS WITH PERIPHERAL ATHEROSCLEROSIS

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Patients with multifocal atherosclerosis are at a very high risk of developing cardiovascular diseases, and both acute and chronic forms of coronary artery disease make a significant contribution to the structure of mortality and disability. The study included 519 patients with atherosclerosis of various localizations. Patients had their complaints collected, and their medical history and objective status were analysed. Standard laboratory tests were carried out to evaluate lipid profile indicators, complex of instrumental studies. In the course of logistic regression analysis, we found that such combinations of factors as “duration of diabetes mellitus, years + history of myocardial infarction” ( $p = 0.030$ ), “presence

of CHF + duration of diabetes mellitus, years" ( $p=0.049$ ), "EF value, % + history of myocardial infarction" ( $p = 0.0006$ ), "number of affected vascular territories + presence of CHF" ( $p < 0.001$ ), "number of affected vascular regions + history of MI" ( $p < 0.001$ ), influenced on the risk of developing fatal and non-fatal cases of myocardial infarction in patients of the study group. The compiled nomogram using such a combination of factors as "the number of affected vascular territories + a history of MI" established that in the presence of damage to two vascular territories and a history of MI, the risk of developing fatal and non-fatal cases of infarction was 19%, in patients without MI – 8%. With atherosclerotic lesions of four vascular regions and the presence of a burdened medical history, the probability of risk reached 56%, in the absence of a history of myocardial infarction 24%.

**Keywords:** fatal and non-fatal infarction, long-term prognosis, risk factors

[Abstract:2550]

## CARDIOVASCULAR RISK PROFILE HOSPITALIZED PATIENTS FOR ISCHEMIC EVENTS IN A REGIONAL HOSPITAL

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**Purpose:** Evaluate cardiovascular risk factors (CVRFs) hospitalized patients in our unit for cerebral and cardiac ischemia.

**Methods:** It was a prospective longitudinal observational study in hospitalized patients for ischemic heart disease or stroke between August 2022 and May 2023.

We recorded: age, sex, body mass index (BMI), and CVRFs diagnosed and treated previously: hypertension (HT); diabetes mellitus (DM) and lipid profile.

**Findings:** We had 41 patients. Hospitalized reason was ischemic heart disease in 58.5% and stroke in 41.5%. Ischemic heart disease population were 66.7% men and 33.3% women.

Most frequent CVRF was HT (58.3%).

BMI median was  $29.7 \pm 4.2$ .

29.2% have DM diagnosis, whose with treatment glycosylated haemoglobin (HbA1c) median was  $6.3 \pm 1.1$ ; while without treatment HbA1c median was  $5.6 \pm 0.1 \pm 1.1$ .

Respect to the dyslipidaemia study, 50% were previously treated and lipid profile medians can be seen in Table 1. Stroke population were 70.6% men and 29.4% women.

There were same HT percentage and dyslipidaemia: 64.7%. Lipid profile medians can be seen in Table 2.

BMI median was  $29.9 \pm 4.7$ .

There were 29.4% DM diagnosis. With treatment HbA1c median was  $6.6 \pm 1.1$ , while without treatment HbA1c median was  $5.4 \pm 0.3$ .

**Conclusions:** - HT is the most common CVRF

- DM was generally well controlled.

- Lipid profile in both populations showed suboptimal control.

- Both populations median BMI were at upper limit of overweight range.

**Keywords:** cardiovascular risk factors, ischemic heart disease, stroke

Dyslipidemia treatment	Total cholesterol	HDL	LDL	Triglycerides	No HDL cholesterol	Total cholesterol/HDL	Triglycerides/HDL
No (50%)	$177.3 \pm 38.6$	$39.3 \pm 13.1$	$102.1 \pm 31$	$180.2 \pm 143.3$	$138.1 \pm 35.7$	$4.8 \pm 1.2$	$4.8 \pm 3.5$
Yes (50%)	$157.7 \pm 53$	$45.8 \pm 17.7$	$84.8 \pm 44$	$138.1 \pm 60.3$	$111.9 \pm 42.1$	$3.7 \pm 0.9$	$4.2 \pm 3.9$
Total	$167.5 \pm 46.4$	$42.5 \pm 15.6$	$93.4 \pm 38.2$	$159.1 \pm 109.6$	$125 \pm 40.5$	$4.3 \pm 1.2$	$4.5 \pm 3.6$

Table 1. Ischemic heart disease lipid profile median.

Dyslipidemia treatment	Total cholesterol	HDL	LDL	Triglycerides	No HDL cholesterol	Total cholesterol/HDL	Triglycerides/HDL
No (35.3%)	$178.2 \pm 46.9$	$39.7 \pm 8.3$	$113.8 \pm 41.1$	$124 \pm 25.9$	$138.5 \pm 40.2$	$4.4 \pm 0.6$	$3.4 \pm 0.9$
Yes (64.7%)	$152.9 \pm 54.6$	$38.9 \pm 8.2$	$83.1 \pm 41.1$	$197.5 \pm 133.1$	$113.1 \pm 49.8$	$3.9 \pm 0.9$	$5.2 \pm 3.2$
Total	$161.8 \pm 51.9$	$39.2 \pm 7.8$	$93.9 \pm 42.6$	$171.6 \pm 112.2$	$122.1 \pm 46.9$	$4.1 \pm 0.8$	$4.5 \pm 2.7$

Table 2. Stroke population lipid profile medians.

[Abstract:2559]

## ANALYSIS OF TOOLS FOR PREDICTING LONG-TERM PROGNOSIS IN PATIENTS WITH PERIPHERAL ATHEROSCLEROSIS

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A risk calculator for cardiovascular events and adverse outcomes was developed using binary logistic regression. The results of an examination of 195 patients with peripheral atherosclerosis were taken into account, of which fatal and non-fatal cardiovascular events and adverse outcomes over three years developed in 45 patients. An assessment of the one-year and two-year risk, according to the EUROASPIRE calculator, in the patients sampled in this study demonstrated that all 195 patients had a high risk (more than 5%). But a prospective analysis revealed that over three years, cardiovascular events and adverse outcomes developed in only 45 (23.1%) of 195 patients. Thus, the median CVD 1 was 15%, the interquartile range was 13–19%, and the range was 8–29%. The median CVD 2 corresponded to 32%, the interquartile range was 28–35%, and the range was 18–55%. Consequently, the specificity of the EUROASPIRE calculator turned out to be low. To reveal the additional diagnostic capabilities of the EUROASPIRE questionnaire using ROC analysis, we attempted to find another dividing level for risk assessment. Thus, the excess of the CVD 1 value by more than 17% with statistical significance ( $p < 0.001$ )

made it possible to form a conclusion about a high risk of cardiovascular events and adverse outcomes with a diagnostic sensitivity of 71.9% and specificity of 75.8%. Despite the correction of the separation level when assessing the risk of long-term, unfavourable long-term prognosis using the EUROASPIRE algorithm, its information content was inferior to that of our calculator.

**Keywords:** *risk assessment calculator, cardiovascular events, coronary atherosclerosis, peripheral atherosclerosis*

[Abstract:2574]

## TRANSTHYRETIN CARDIAC AMYLOIDOSIS: CLINICAL CASES

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Transthyretin cardiac amyloidosis has two forms: hereditary (hATTR) and wild-type (wtATTR). At the internal medicine heart failure unit (IMHFU), we seek early diagnosis of wtATTR by clinical suspicion and non-invasive methods. We analysed 11 patients with confirmed cardiac amyloidosis. The median age was 84 years, with a male predominance (7 males, 4 females). Interventricular septal thickness averaged 14.69 mm on echocardiogram, and all showed at least one indicative sign at diagnosis. Heart failure was the main clinical manifestation, with the majority in NYHA functional class II. In addition, other signs were observed such as changes in blood pressure in previously hypertensive patients, symptoms compatible with peripheral polyneuropathy, previous interventions in the lumbar canal, carpal tunnel syndrome, proteinuria and less commonly, skin bruising and sensory involvement. Diagnosis was achieved mainly by non-invasive methods such as cardiac scintigraphy with diphosphonates and bone scintigraphy, with wtATTR being confirmed in all cases after negative genetic testing. Until now, treatment has been mainly symptomatic. However, the recently approved tafamidis has been shown to improve survival. Two of our patients are currently on active treatment with tafamidis with good tolerability. Our patients benefit from follow-up in specialised consultation such as the IMHFU and the Huelva multidisciplinary amyloidosis unit (UMAH), where collaboration between services facilitates a comprehensive approach to the disease. In summary, early identification of ATTR cardiac amyloidosis is crucial, as it is a frequent cause of heart failure. Tafamidis represents a recent hope for improving survival in these patients.

**Keywords:** *transthyretin, cardiac, amyloidosis*

[Abstract:2604]

## VEXUS: A FUNDAMENTAL TOOL IN THE PATIENT WITH HEART FAILURE

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A 78-year-old male, with a dual mitral lesion history and recent decompensated heart failure (HF) admission, is currently on bisoprolol 2.5 mg, ramipril 5 mg, and furosemide 120 mg at home. In an HF consultation for progressive dyspnoea, escalating to rest-induced symptoms indicative of decompensated HF, he presented as afebrile, hemodynamically stable, and with 98% saturation. Cardiorespiratory examination revealed wet lung crackles and knee-oedema. Ultrasound indicated severe tissue and intravascular congestion (inferior vena cava >21 mm, bilateral pleural effusion, significant B-lines, and VExUS signalling severe congestion in portal, suprahepatic, and intrarenal veins).

Intravenous furosemide treatment (250 mg/day) at the medical day hospital lasted 16 days, with ultrasound monitoring guiding therapy (Figures 1 and 2). Clinical improvement led to transitioning to oral furosemide (80 mg/day) at home upon the disappearance of ultrasound signs for both congestion types.

Distinguishing intravascular from tissue congestion is crucial in HF (Table 1). Intravascular congestion, often asymptomatic, precedes extravascular congestion by weeks, challenging traditional examination. Intravascular congestion is preferred for diuretic guidance due to the need for invasive measurements, potential early intervention, and its link to HF readmissions.

The 2020 VExUS protocol provides a non-invasive qualitative assessment of venous congestion via clinical ultrasound, analysing venous flows with pulsed Doppler.

In conclusion, recognizing intravascular congestion is vital in HF. This case demonstrates the correlation between Doppler venous flows and congestion parameters, aiding tailored treatment decisions.

**Keywords:** *VExUS, ultrasonography, heart failure*

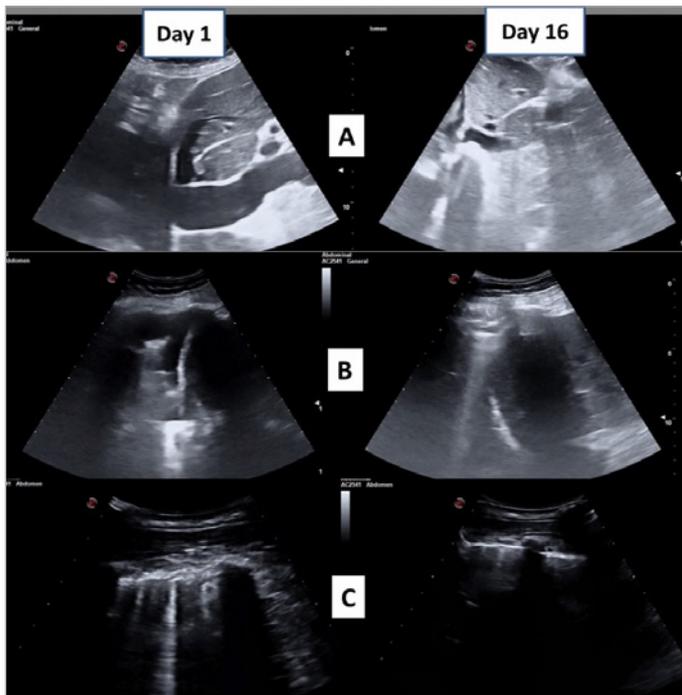


Figure 1. Comparative ultrasound evolution of congestion between days 1 and 16 of treatment. A: Inferior vena cava decongestion. B: Resolution of pleural effusion. C: Elimination of significant B-lines in lung parenchyma.

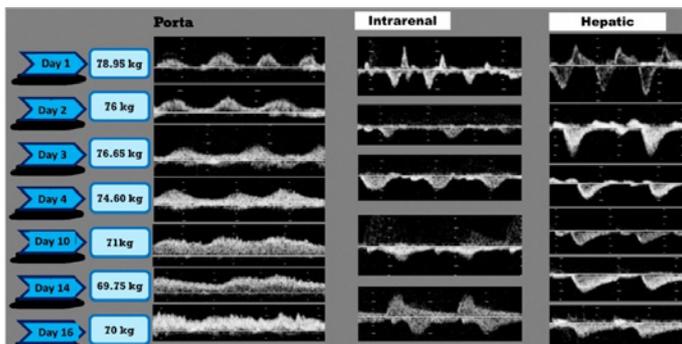


Figure 2. Evolution of intravascular congestion between days 1 and 16 assessed using the VExUS protocol (venous Doppler of the portal vein, intrarenal veins, and hepatic veins) and correlation with weight variation.

	Tissue Congestion	Intravascular Congestion
Clinical Signs	<ul style="list-style-type: none"> <li>• Oedema</li> <li>• Crackles</li> <li>• Ascites</li> </ul>	<ul style="list-style-type: none"> <li>• Elevated jugular venous pressure</li> <li>• Third heart sound</li> <li>• Orthopnoea</li> <li>• Bendopnea</li> </ul>
Biomarkers	<ul style="list-style-type: none"> <li>• CA 125</li> </ul>	<ul style="list-style-type: none"> <li>• NT-proBNP</li> </ul>
Techniques	<ul style="list-style-type: none"> <li>• Chest X-ray</li> <li>• Pulmonary ultrasound</li> <li>• Chest CT</li> </ul>	<ul style="list-style-type: none"> <li>• Venous Doppler</li> <li>• Implantable pressure sensors</li> </ul>

Table 1. Differential characteristics between tissue and intravascular congestion.

[Abstract:2706]

## PREVALENCE AND DIAGNOSTIC TOOLS FOR DELIRIUM IN DECOMPENSATED HEART FAILURE PATIENTS

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**Objective:** To compare different types of screening (RASS and CAM) for the early detection of delirium in patients admitted for decompensation of heart failure.

**Materials and Methods:** Prospective study including patients admitted for decompensation of HF. Patients were screened for delirium with the RASS and CAM tests and it was determined in the evolution if they met the clinical criteria for delirium and two ROC curves were generated for each of the tests.

**Results:** 38 patients were analysed of whom 11 (29% prevalence) presented clinical criteria for delirium. Figure 1 shows the four ROC curves generated. Table 1 shows the cut-off points for each analysis with their respective PPV, NPV and AUC. The models using the CAM test have a better NPV, especially the Poisson model which with a 95% probability will have an NPV of 96%. On the contrary, the RASS test has a better positive predictive value, especially Poisson's which with a 72% probability reaches a positive predictive value of 80%.

**Conclusions:** The prevalence of delirium in HF patients is high and screening is pertinent. The CAM scale offers a better role to rule out acute confusional syndrome and the RASS scale would be more useful to make its diagnosis.

Bibliography: Han JH, McNaughton CD, Stubblefield WB et al; Emergency Medicine Research and Outcomes Consortium Investigators. Delirium and its association with short-term outcomes in younger and older patients with acute heart failure. PLoS One. 2022 Jul 26;17(7):e0270889. doi: 10.1371/journal.pone.0270889. PMID: 35881580; PMCID: PMC9321444.

**Keywords:** heart failure, delirium, CAM, RASS

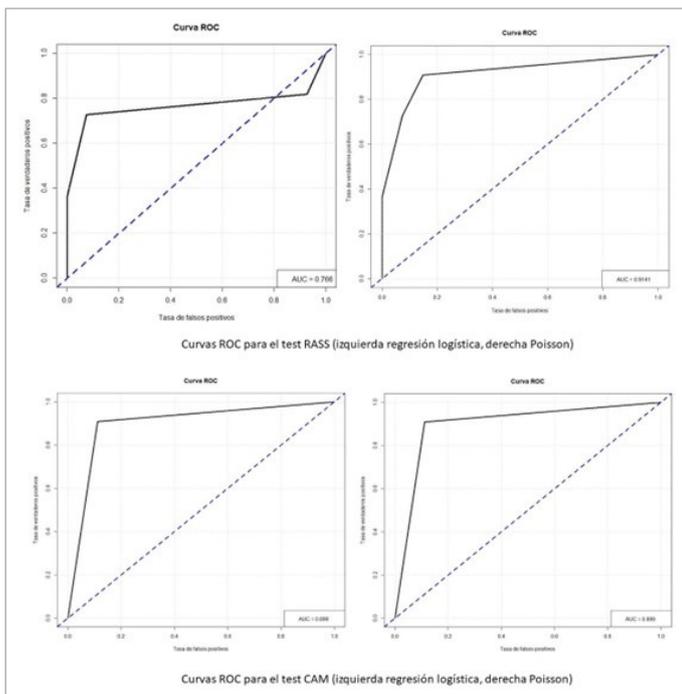


Figure 1. ROC curves for the RASS test and ROC curves for the CAM test (left logistic regression, right Poisson).

	AUC	VPP	VPN	Punt C
GLM RASS	0.76	80%	89%	0.50
Poisson RASS	0.91	80%	89%	0.72
GLM CAM	0.89	78%	96%	0.90
Poisson CAM	0.89	77%	96%	0.95

Table 1. Cut-off points for each analysis with their respective PPV, NPV and AUC.

[Abstract:2707]

## CHARACTERISTICS OF PATIENTS WITH DELIRIUM AND HEART FAILURE

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**Objective:** To describe the characteristics of patients with heart failure diagnosed with delirium using the RASS and CAM scales and to determine which variables may contribute to the presence of this pathology.

**Materials and Methods:** Prospective study including patients admitted for decompensation of heart failure. The RASS and CAM scales were used as screening methods. Medians and interquartile range are used for quantitative variables, which are compared using the Wilcoxon test. Qualitative variables are compared with the Fisher or Chi-square test. Finally, an algorithm is developed

using RandomForest to determine which variables have the greatest influence on the presence of delirium.

**Results:** 38 patients were analysed. Eleven patients were classified as having delirium, whose characteristics are presented in table 1. There was a predominance of women with older age, more comorbidity, more functional disability, sarcopenia, and malnutrition. In the decision tree (RandomForest, figure 1), the most important variables in determining a state of delirium are functional capacity (Barthel), comorbidity (Charlson), sarcopenia (SARC-F), age and cognitive status assessed by the minimal test.

**Conclusions:** The presence of different factors such as age, sex, insomnia, low functional capacity, the presence of sarcopenia or cognitive impairment or nutritional status are associated with the development of delirium in patients with heart failure.

Bibliography: Han JH, McNaughton CD, Stubblefield WB et al; Emergency Medicine Research and Outcomes Consortium Investigators. Delirium and its association with short-term outcomes in younger and older patients with acute heart failure. PLoS One. 2022 Jul 26;17(7):e0270889. doi: 10.1371/journal.pone.0270889. PMID: 35881580; PMCID: PMC9321444.

**Keywords:** heart failure, delirium, CAM, RASS

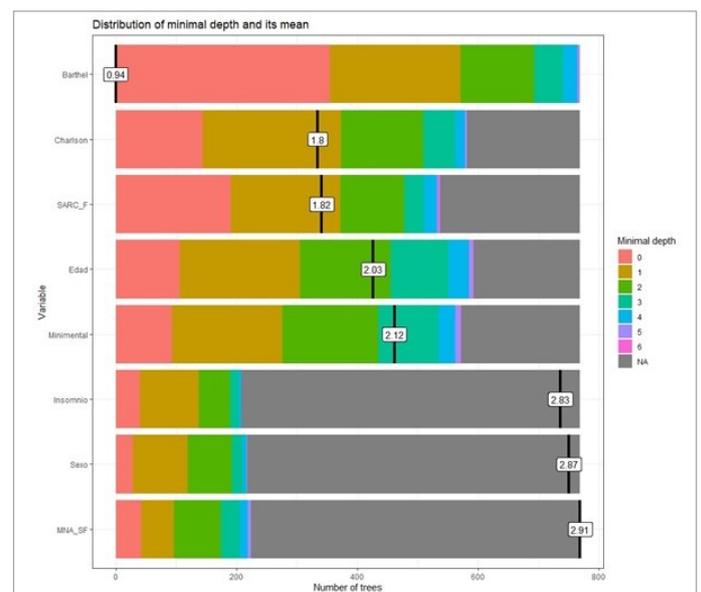


Figure 1. Decision tree (RandomForest) where the most important variables in determining a state of delirium are objectified.

Variable	Delirium	No delirium	P
N	11	27	
Age	89 (7)	83 (11)	0.02
Female sex	9 (81.8)	11 (40.7)	0.03
Alcohol	0	6 (22.2)	0.15
HTA	10 (90.9)	25 (92.6)	1
DM	3 (27.3)	13 (48.1)	0.29
FA	7 (63.6)	18 (66.7)	1
Blindness	2 (18.2)	4 (14.8)	1
Insomnia	10 (90.9)	15 (55.6)	0.05
Deafness	5 (45.4)	6 (22.2)	0.23
Charlson	10 (1)	8 (2)	0.01
Barthel	40 (60)	75 (30)	0.001
SARC-F	8 (3)	6 (4)	0.0004
PAS	121 (30)	134 (33)	0.35
Haemoglobin	11.2 (4.7)	11.8 (2.4)	0.29
Creatinine	1.47 (0.64)	1.37 (0.72)	0.96
Albumin	3.4 (1.6)	3.9 (0.4)	0.03
Sodium	138 (7)	139 (6)	0.98
Potassium	4.3 (1)	4.3 (0.9)	0.71
NT-proBNP	5235 (4814)	4537 (8684)	0.85
PCR	26.8 (36.3)	14.9 (26.3)	0.27
Sarcopenia (SARC-F)	11 (100)	18 (66.7)	0.03
Malnutrition (MNA)	3 (27.39)	0	0.01
Risk of malnutrition (MNA)	6 (54.4)	21 (77.8)	
Minimental	20 (15)	28 (7)	0.15

Table 1. Characteristics in patients diagnosed with delirium

[Abstract:2718]

## PHARMACOTHERAPY MONITORING IN OLDER PATIENTS WITH ATRIAL FIBRILLATION AND CORONARY ARTERY DISEASE

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**Purpose:** Multimorbidity and polypharmacy is common in elderly patients. STOPP/START criteria are formulated to identify potentially inappropriate medicines (PIMs) and potential prescription omissions (PPOs). This study aimed to analysing the compliance of prescribed pharmacotherapy with the STOPP/START criteria in hospitalized patients 65 years and older with atrial fibrillation (AF) and stable coronary artery disease (CAD).

**Methods:** A cohort retrospective study was conducted among 342 patients (the median age 85 [78;90] years, 68.7% women) with AF and CAD. PIMs and PPOs were identified according to STOPP/START version 2 criteria.

**Findings:** The prevalence of PIMs and PPOs were 45% and 93.3%, respectively. Statins were the most common PPOs (38.1% of all detected START criteria; 80.4% of the total number of patients). The most frequent PIMs was anticholinergic drugs for chronic constipation (30.0% of all detected STOPP criteria; 21.9% of the total number of patients). Anticoagulants were not prescribed to

22.5% of patients, 6.4% of patients received warfarin and 73.4% - direct oral anticoagulants (DOACs). 26.6% of patients received an unreasonable DOACs dose adjustment, and 4.4% of patients received overdose. Of those patients who received anticoagulants, only 12.3% were prescribed gastroprotective therapy (100% proton pump inhibitors).

**Conclusions:** Our results indicate the need for pharmacotherapy monitoring in older adults using special tools, in particular, STOPP/START criteria.

**Keywords:** atrial fibrillation, stable coronary artery disease, pharmacotherapy monitoring

[Abstract:2724]

## VENOUS THROMBOEMBOLIC DISEASE WITH NEGATIVE D-DIMER

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**Purpose:** to describe a case of deep vein thrombosis (DVT) and pulmonary thromboembolism (PTE) with negative D-dimer.

**Findings:** 65-year-old male with chronic venous insufficiency who decreased his physical activity in the previous two months due to gonalgia. He referred sudden pain at right costal level resistant to usual analgesics for 2 weeks, without other symptomatology. D-dimer was normal (0.39 mcg/ml). Chest X-ray showed right basal Hampton's hump. Given clinical and radiological findings, thoracic CT angiography and lower limb venous Doppler ultrasound were requested. The patient was diagnosed of asymptomatic deep vein thrombosis in the left lower extremity and incipient pulmonary thromboembolism with pulmonary infarction at the level of segment 8 of the right lung, with no signs of right overload in the echocardiogram. He started anticoagulant treatment with low molecular weight heparins, later adjusted to acenocoumarol until completing 6 months, with complete clinical-radiological resolution of the condition.

**Conclusions:** D-Dimer is a very useful diagnostic tool especially in emergency departments due to its high negative predictive value in the diagnosis of DVT and PTE. High values support the performance of additional imaging tests to rule out these pathologies in those patients without clear clinical symptoms. However, it should not be decisive in the presence of clinical suspicion compatible with thromboembolic disease. Normal values do not rule out the diagnosis if at least one month has elapsed since the onset of symptoms. CT angiography is recommended in patients with chronic costal pain and normal basic complementary studies.

**Keywords:** D-dimer, deep vein thrombosis, pulmonary thromboembolism, CT angiography

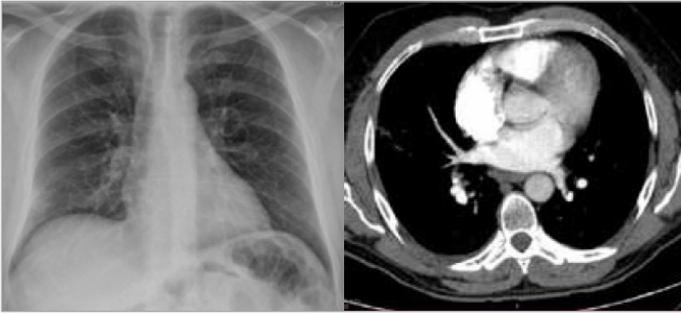


Figure 1.



Figure 2.

[Abstract:2725]

## PROGNOSTIC VALUE OF HIGH-SENSITIVITY C-REACTIVE PROTEIN IN PATIENTS WITH CHRONIC HEART FAILURE WITH PRESERVED EJECTION FRACTION

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**Purpose:** To investigate the prognostic value of high-sensitivity C-reactive protein (hs-CRP) in patients with heart failure with preserved ejection fraction (HFpEF).

**Methods:** Altogether data from the 400 patients using hospital database were included and stratified according to the tertiles of hs-CRP levels (T1: hs-CRP <4.32, T2: 4.32-5.77, and T3: >5.77

mg/l). The endpoints were all-cause and cardiovascular, in-hospital and post-discharge mortality within the 1 year after discharge from the hospital. Independent effects of hs-CRP levels on in-hospital and post-discharge outcomes assessed after adjustment for some clinical and laboratory covariates.

**Results:** During the index admission 28 (7.0%) patients died, and all of them had decompensated heart failure as the cause of death with the highest values in T3 of hs-CRP (n=26; 19.5%). We observed an increase in in-hospital mortality with an increase in the hs-CRP tertile: for T3 compared to T1 odds ratio (OR) was 29.4; 95% confidential interval (CI) 5.0-173.7; p<0.001. During follow-up 65 (17.5%) patients died, and 56 (15.0%) of them had a cardiovascular cause of death. The highest rate of all-cause mortality observed in T3 of hs-CRP (n=28; 21.5%). Compared to T1 an increase in the hs-CRP tertiles was independently associated with post-discharge all-cause mortality (T2: OR 2.02; 95% CI 1.06-3.84; p=0.032; T3: OR 2.12; 95% CI 1.09-4.12; p=0.027) as well as cardiovascular mortality (T2: OR 2.31; 95% CI 1.15-4.63; p=0.019; T3: OR 2.36; 95% CI 1.13-4.94; p=0.023)

**Conclusions:** hsCRP level can be considered as a useful mortality predictor in patients with HFpEF.

**Keywords:** heart failure, inflammation, mortality

[Abstract:2731]

## INFLUENCE OF ABCB1, CYP3A4 AND CYP3A5 GENE POLYMORPHISMS ON PHARMACOKINETICS OF APIXABAN AND BLEEDING IN PATIENTS WITH ATRIAL FIBRILLATION AND CHRONIC KIDNEY DISEASE

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**Aim:** to assess the effect of polymorphic variants of ABCB1 (rs2032582, rs1045642, rs1128503), CYP3A5 (rs776746), CYP3A4 (rs35599367) genes on bleeding and levels of residual equilibrium concentration (C<sub>min,ss</sub>/D) of apixaban in patients with non-valvular atrial fibrillation (AF) and chronic kidney disease (CKD) stages C3-C4.

**Materials and Methods:** 142 patients with AF and CKD stages 3-4, who received apixaban (mean age 84 [76;90] years, 95 (66.9%) women), were included in the study. Bleeding events were identified in 56 (39.4%) patients. Pharmacogenetic and pharmacokinetic testing were performed.

**Results:** carriers of the TT genotype of the rs1045642 polymorphism of the ABCB1 gene had lower blood levels of C<sub>min,ss</sub>/D of apixaban (13.4 [8.6;20.2] ng/mL) compared to carriers of the CC and TC genotypes (20.3 [12.2;33.3] ng/mL and 18 [11.9;28.7] ng/mL, respectively, p=0.027 and 0.034, respectively). Carriers of the GG genotype of the rs2032582 polymorphism of

the ABCB1 gene had higher C<sub>min,ss</sub>/D levels of apixaban (20.3 [13.2;35] ng/mL) compared to carriers of the GT genotype (17.5 [9.3;23.4] ng/mL,  $p=0.037$ ). There were fewer carriers of the TC genotype (16 (45.7%) carriers of the rs1045642 polymorphic variant of the ABCB1 gene among the bleeding patients compared to patients without bleeding patients (43 (53.1%) patients,  $p=0.024$ ).

**Conclusions:** the results of the study suggest a relationship between the presence of polymorphic variants of ABCB1 (rs1045642) and CYP3A5 (rs776746) genes with the presence of bleeding and residual concentration of apixaban in patients with AF and CKD stages 3-4.

**Keywords:** atrial fibrillation, chronic kidney disease, pharmacogenetics

[Abstract:2735]

### ASSOCIATION OF HIGH-SENSITIVITY C-REACTIVE PROTEIN LEVELS AND CYP2C19 POLYMORPHIC MARKER WITH CARDIOVASCULAR DISEASE RISK FACTORS IN YOUNG AND MIDDLE-AGED INDIVIDUALS

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**Aim:** To assess the relationship between the level of high-sensitivity C-reactive protein (hs-CRP) and polymorphic marker of CYP2C19 (CYP2C19\*2) gene with cardiovascular disease (CVD) risk factors in young and middle-aged persons.

**Materials and Methods:** 193 individuals aged 30-55 years without acute diseases, as well as exacerbations of chronic diseases, diabetes mellitus and CVD were included in the study. Hs-CRP was analysed, CYP2C19 genotyping (rs4244285 and rs4986893) was performed, and the association between hs-CRP, CYP2C19\*2 and CVD risk factors was analysed.

**Results:** 46.6% of subjects had elevated hs-CRB levels  $\geq 2$  mg/L. The frequency of CYP2C19\*2 (A) loss-of-function alleles was 20%. The incidence of high normal blood pressure (BP) (130-139 and/or 85-89 mmHg) was higher in the CYP2C19\*2 (A) subgroup compared to GG (26.7% vs. 5.2%,  $p=0.03$ ) in subjects without arterial hypertension (AH) and BP  $\geq 140$  and/or 90 mmHg on the visit. Mean systolic BP was 5 mmHg higher in the CYP2C19\*2 (A)

group than in the CYP2C19\*2 (GG) group (125 vs. 120 mmHg,  $p=0.01$ ). CYP2C19\*2 (A) was associated with higher mean levels of both systolic and diastolic BP ( $p=0.015$  and  $p=0.044$ , respectively) in patients with AH.

**Conclusions:** The association of CYP2C19\*2 with BP level suggests a possible role of this factor in the development of AH, which requires further studies.

**Keywords:** genetic polymorphism, blood pressure, high-sensitivity C-reactive protein

[Abstract:2748]

### COMPARATIVE ANALYSIS OF STRUCTURAL AND FUNCTIONAL MYOCARDIAL REMODELLING IN PATIENTS WITH ISCHEMIC HEART DISEASE DEPENDING ON THE PRESENCE OF CONCOMITANT ATRIAL FIBRILLATION

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**Purpose:** To compare left atrial (LA) and left ventricular (LV) myocardial remodelling in patients with coronary heart disease (CHD) depending on the presence of concomitant atrial fibrillation (AF).

**Methods:** 89 patients were included and they were divided into two groups: 1) Patients with CHD ( $n=48$ , mean age  $64.9 \pm 9.16$  years); 2) Patients with CHD and AF ( $n=41$ , mean age  $67.0 \pm 8.3$  years). All patients underwent routine and 2D Speckle Tracking echocardiography (Philips EPIC7).

**Results:** LV ejection fraction was preserved and didn't difference between groups. In the group 2 the absolute value of global LV longitudinal strain and its velocity ( $-16.3 \pm 4.4\%$  and  $1.9 \pm 0.4$   $s^{-1}$ ) were significantly lower compared to the group 1 ( $-18.3 \pm 3.5\%$ ,  $p=0.021$  and  $2.1 \pm 0.4$   $s^{-1}$ ,  $p=0.045$ ), indicating more pronounced myocardial deterioration in the first group, including its fibrosis. In group 2 compared to group 1 significantly higher values of E peak acceleration (respectively,  $1110.4 \pm 560.0$   $cm/sec^2$  and  $853.9 \pm 426.7$   $cm/sec^2$ ;  $p=0.016$ ) were detected, which may indicate higher values of LV filling pressure in the first group. In group 2 compared to group 1 significantly higher LA stiffness index (respectively,  $0.91 \pm 0.98$  and  $0.43 \pm 0.28$ ;  $p=0.004$ ), and significantly lower LA strain (respectively,  $16.7 \pm 8.8\%$  and  $23.3 \pm 6.5\%$ ;  $p=0.001$ ) were revealed, which may demonstrate deeper structural changes in LA myocardium.

**Conclusions:** Despite preserved LV ejection fraction in both groups, patients with concomitant AF have more pronounced

structural and functional changes in myocardium of the left chambers, probably associated with deeper disturbances of LV diastolic function, increase of filling pressure as well as myocardial fibrosis and stiffness increase.

**Keywords:** speckle tracking, atrial fibrillation, coronary heart disease, remodelling

[Abstract:2751]

## COGNITIVE FUNCTION IN PATIENTS WITH DIFFERENT FORMS OF ATRIAL FIBRILLATION

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**Purpose:** To perform a comparative analysis of the cognitive functions in patients with different forms of atrial fibrillation (AF).

**Methods:** The study included patients with AF who were divided into two groups depending on the form of the latter: 1) patients with paroxysmal AF (n=70; mean age 73 [64.8;76.5] years), 2) patients with persistent and permanent AF (n=54; mean age 78.5 [68;83] years). All the patients were examined for cognitive function using Montreal Cognitive Assessment (MoCA), Mini-mental State Examination (MMSE), Verbal fluence test (VFT), Trail Making Test, Word List Memory (WLM) Test, The Stroop Color and Word Test.

**Results:** Compared to group 1, group 2 had a significantly higher number of patients with a total MoCA score <17 points - 4 (5.6%) and 11 (20.9%) individuals, respectively (p=0.023), a total MMSE score ≤24 points - 6 (8.4%) and 13 (24.7%) individuals, respectively (p=0.023), as well as a significantly lower number of words on immediate recall in the WLM test - 2.5 [0.25;4] and 3 [2;4.5] words, respectively (p=0.043). In VFT phonetic fluency as well as semantic fluency were significantly lower in group 2 compared to group 1 - 9 [6;11] and 11 [7.5;13] words, respectively, for letters task (p=0.008), and 15 [11.25;18] and 17 [13;21] words, respectively, for category task (p=0.046).

**Conclusions:** Patients with persistent and permanent AF compared to paroxysmal may be characterized by more severe cognitive decline, including deeper vascular cognitive impairment, deterioration of executive function and integrity of semantic memory.

**Keywords:** atrial fibrillation, cognitive impairment, cognitive functions

[Abstract:2760]

## CARDIAC ULTRASONOGRAPHY, ALL OR NONE?

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**Introduction:** Echocardiography is a cost-effective and safe diagnostic examination, but there are no randomized trials on its actual performance and indications. Our objective is to investigate the adequacy of the 2011 criteria of the American College of Cardiology in hospitalized patients of Internal Medicine, identify the findings in relation to the previous clinical suspicion, evaluate their clinical usefulness and the capacity to change the therapeutic attitude.

**Materials and Methods:** Were analysed all cardiac ultrasonography performed in a section of our hospital from October 2021 to November 2022.

**Results:** The number of patients included was 204, with mean age 87.8 years (SD 7.8), 53.4% women. The reasons for request were 53% heart failure, 18% atrial fibrillation, 13% suspected valvular disease, 11.8% suspected endocarditis and 22.1% other conditions. The percentage of appropriate indications was 70.6%, uncertain 17.2%, and inappropriate 12.3%. The information modified the therapeutic attitude in 45%. The ultrasound diagnoses were valvular disease in 39.7%, infective endocarditis 1.5%, pericardial effusion 5.4%, reduced ejection fraction 16.2% and TTR amyloidosis pattern in 6.4%.

180 studies were done by specialists in Internal Medicine and 24 by cardiologists.

**Conclusions:** The criteria assumed for classifying a request as appropriate or not are hardly applicable to hospitalized patients, but there is a significant percentage of inappropriate or uncertain echocardiograms. This experience shows that Internal Medicine specialists, with correct training, could perform a large part of cardiac ultrasound in the ward.

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**Keywords:** echocardiography, criteria american college of cardiology, internal medicine

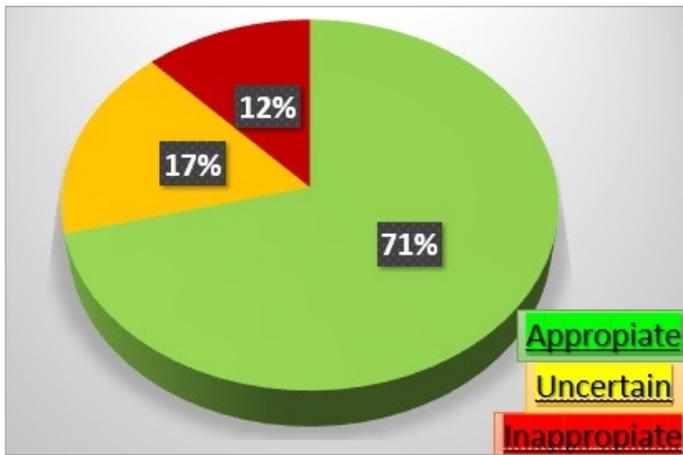


Figure 1. Adequacy of the application.

	sum of squares	ANOVA			
		gl	square mean	f	sig.
Heart failure	8.044	1	8.044	38.039	0.000
Arrhythmia	2.261	1	2.261	16.294	0.000
Suspected endocarditis	0.531	1	0.531	5.190	0.024
Suspected valvulopathy	0.649	1	0.649	5.949	0.016
Pleural effusion and others	4.884	1	4.884	32.677	0.000
Confirmation of endocarditis	0.036	1	0.036	2.507	0.115
Pericardial effusion	0.076	1	0.076	1.488	0.224
Suggestive TTR amyloidosis	0.015	1	0.015	0.245	0.621

Table 1. ANOVA. Predictive factors of the appearance of findings in the echocardiogram. Patients with heart failure, as well as those with requests classified as appropriate, have a greater probability of demonstrating alterations in the echocardiogram ( $p < 0.05$ ).

[Abstract:2835]

## THE DIFFERENTIAL DIAGNOSIS OF HYPOTENSION: ACUTE “COR PULMONALE”

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“Cor pulmonale” is characterized by dilatation of the right ventricle and paradoxical movement of the interventricular septum. Acute “cor pulmonale” is usually secondary to an acute respiratory distress syndrome, a pulmonary embolism, right myocardial infarction, myocarditis, or abrupt suspension of pulmonary vasodilators. It is a condition with high mortality.

The authors present a 68-year-old woman with pulmonary arterial hypertension (PAH) by systemic sclerosis (SS), treated with bosentan, tadalafil, and selexipag improving her risk to a low level in the follow-up. She is also treated with mycophenolate

mofetil (MM) due to a pleuroparenchymal fibroelastosis.

The patient went to the emergency department with diarrhoea, vomiting, painful abdominal palpation, hypotension, and fever. She started antibiotics and intensive fluid therapy. The pulmonary vasodilators were suspended due to systemic hypotension.

During the next hours, she presented with bad evolution with the development of acute respiratory insufficiency, and signs of pulmonary and systemic congestion, even a broad spectrum of antibiotics. A transthoracic echocardiogram showed a severe acute right ventricular dysfunction, with indirect data of pressure and volume overload. Cardiogenic shock was treated with inotropes (dobutamine) and low doses of vasopressors, with high intravenous diuretic therapy. After that, pulmonary vasodilators were restarted with good tolerability and progressive evolution. Nonetheless, a cytomegalovirus protein chain reaction (PCR) was positive with typical colonoscopy findings.

This case report shows how complex it can be for patients with PAH, and the importance of the pulmonary hypertension treatment's maintenance and teamwork for knowing the particularities of the management of these patients.

**Keywords:** pulmonary arterial hypertension, acute cor pulmonale, right heart failure

[Abstract:2848]

## DESCRIPTIVE ANALYSIS OF PATIENTS WITH CHRONIC KIDNEY DISEASE ADMITTED FOR ACUTE HEART FAILURE TO A CARDIOLOGY UNIT

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**Goals:** The objective is to analyse the clinical and epidemiological characteristics of patients with chronic kidney disease admitted for acute heart failure to a Cardiology unit.

**Materials and Methods:** Descriptive analysis. Cohort study in multicentre open registry format in patients admitted for AHF under the care of Cardiology in all hospitals in Castilla y León (Spain), between 06/01/2021 and 12/01/2022.

**Results:** 200 patients were included, with a mean age of 78.37 years and a mean BMI of 27.02. The mean creatinine level on admission was 1.81 mg/dl and the mean glomerular filtration rate was 39.20 ml/min/1.73m<sup>2</sup>. The most frequent comorbidity was arterial hypertension (82.2%), followed by dyslipidaemia (62.4%) and diabetes mellitus (47.5%). 1.5% were users of renal replacement therapy. 90.1% of patients had a high Charlson comorbidity index. 63.6% had previously had an episode of heart failure. Only 41.6% of the total hadn't had any hospital admission

for HF in the previous year. The most common type of HF was preserved ejection fraction (46.2%). 40.7% had a reduced LVEF and 13.1% had a moderately reduced LVEF. The most prevalent functional class prior to admission was class II, at 46.4%.

**Conclusions:** Most risk factors for cardiovascular disease are also highly prevalent in patients with CKD. The prevalence of functional class II translates into suboptimal control and makes AHF a very common reason for hospitalization in these patients. There is no significant trend in ejection fraction.

**Keywords:** chronic kidney disease, heart failure, cardiovascular disease, ejection fraction

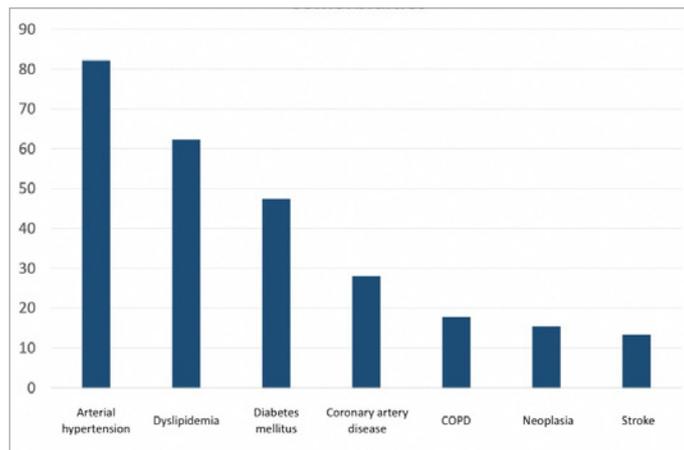


Figure 1. Comorbidities.

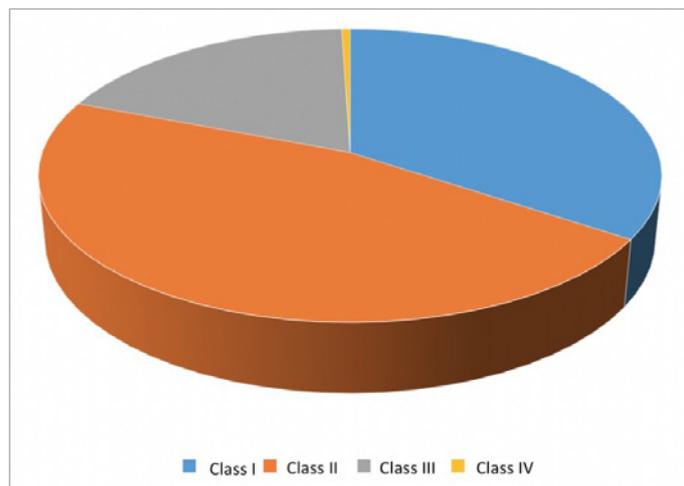


Figure 2. NYHA Functional Classification.

[Abstract:2856]

## ASSOCIATION OF KIDNEY DAMAGE MARKERS WITH THE BLEEDING RISK IN PATIENTS WITH ATRIAL FIBRILLATION AND CHRONIC KIDNEY DISEASE RECEIVING RIVAROXABAN

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**Purpose:** To evaluate the relationship between urinary albumin concentration, urinary markers of kidney injury – nephrin, neutrophil gelatinase associated lipocalin (NGAL), kidney injury molecule-1(KIM-1) and bleedings in patients with atrial fibrillation (AF) and concomitant chronic kidney disease (CKD) stages 3 (G3) and 4 (G4) receiving rivaroxaban.

**Methods:** 70 patients with AF and CKD G3a (mean age 79,1 years), and 63 patients with AF and CKD G3b/4 (mean age 79,7 years) were included in the study. Analysis of haemorrhagic complications using a bleeding questionnaire was performed and all patients were divided into two groups: (1) with haemorrhagic events (n=46), (2) without haemorrhagic events (n=87). Control group was formed by 44 healthy volunteers. Assessment of urinary albumin excretion and levels of kidney injury markers were performed in all participants.

**Results:** The urinary nephrin level in controls was significantly lower compared to patients with AF and CKD either with or without haemorrhagic events ( $p < 0.001$  for both). Urinary NGAL in controls was significantly lower compared to patients with haemorrhagic events ( $p < 0.001$ ) as well as patients without them ( $p = 0.006$ ). The NGAL level in the bleeding group was significantly higher compared to patients without these events ( $p = 0.039$ ). The level of KIM-1 was significantly higher in patients with haemorrhagic events compared to both patients without these complications ( $p = 0.019$ ) and controls ( $p = 0.003$ ).

**Conclusions:** In patients with AF and CKD G3/G4, receiving rivaroxaban, the urinary level of NGAL and KIM-1 is higher in the presence of haemorrhagic events and may indicate the role of tubular damage in increasing bleeding risk.

**Keywords:** atrial fibrillation, chronic kidney disease, rivaroxaban, bleeding, NGAL, KIM-1

[Abstract:2875]

## A CORRELATION BETWEEN CARDIAC TROPONIN LEVELS AND ACUTE CORONARY SYNDROME IN AN ACUTE (MODEL-3) HOSPITAL IN IRELAND

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Introduction: Serum troponin T (cTnT) measurements are applied in detecting cardiac muscle injury in terms of sensitivity and specificity. The established biochemical diagnostic for Acute Coronary Syndrome (ACS) is correlated to elevated troponin concentrations.

We determined the correlation between MI in patients with ACS and cTnT level when it is above 100 ng/L.

**Methods:** We selected patients with troponin above 100 ng/L from all samples requested from June to December 2023. We divided them into three different categories group 1 – troponin level between 100 ng/l - 500 ng/l, group 2 – troponin level 500 ng/l -1000 ng/l and group 3 – troponin Level 1000 ng/l or more and compared the results with patient's diagnosis, excluding patients with CKD (CrCl < 30), pulmonary embolism (PE) (confirmatory CT scan) and sepsis (qSOFA more than 2).

**Results:** From 9780 patients attending ED, there were 100 patients with cTnT above 100 mcg/dl - 62% (n=62) male and 38% (n=38) and mean age of 72.59 years. There were 48 patients in group 1, 15 patients in group 2 and 37 patients in group 3. 10 patients have STEMI (2 in group 1, 2 in group 2 and 6 in group 3). The rest of patients have NSTEMI (46 in group 1, 13 in group 2 and 31 in group 3).

**Conclusions:** There is a strong correlation between cTnT and NSTEMI/STEMI presentation. Most of STEMI patients have severely high troponin levels of 1000 ng/L or more, in case of NSTEMI patients, majority will have high troponin levels between 100-500 ng/L

**Keywords:** ACS, STEMI, NSTEMI, cTnT, troponin, MI diagnosis

	Group 1 – Troponin Levels 100-500 ng/l	Group 2 – Troponin Levels 500-1000 ng/l	Group 3 – Troponin Levels 1000 + ng/l
No. of Patients	48	15	37

**Table 1.** Total Number of patients grouped according to their troponin levels.

Category	Group 1 – Troponin Levels 100-500 ng/l	Group 2 – Troponin Levels 500-1000 ng/l	Group 3 – Troponin Levels 1000 + ng/l
STEMI	2	2	6
NSTEMI	46	13	31

**Table 2.** STEMI/NSTEMI patients and their respective group of troponin levels.

[Abstract:2885]

## ASSOCIATION BETWEEN PERCUTANEOUS CORONARY INTERVENTION (PCI) AND TROPONIN (CTNT) LEVELS IN MYOCARDIAL INFARCTION (MI) PATIENTS IN AN ACUTE HOSPITAL (MODEL-3) IN IRELAND

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**Introduction:** PCI treats around 5 million patients with MI globally. cTnT works as biomarker of myocardial necrosis, demonstrating superior sensitivity and specificity in the diagnosis. Our aim is to explore the prognostic value of cTn-I as a risk factor for PCI pre-angiogram and even the correlation with major occlusions of different coronary arteries.

**Methods:** We divided all troponin samples above 100 ng/L into three categories of troponin levels between 100 ng/l - 500 ng/l, 500 ng/l -1000 ng/l and troponin Level 1000 ng/l or more and compared the results with MI, excluding CKD (CrCl < 30), pulmonary embolism (PE with confirmatory CT scan) and sepsis (qSOFA > 2) and compared to the sort of intervention and the coronary artery involved.

**Results:** From 100 patients with raised cTnT, 48% had levels 100-500 ng/l, 15% 500-1000 ng/l and 37% >1000 ng/L. 43% patients underwent PCI, 36% patients underwent angiogram without PCI and 21% had no procedures done. From 43 patients requiring PCI, 60.5% (n= 26) needed stenting to LAD. 50% of them (n=13) had extremely high cTnT of 1000 ng/L or more, followed by 34.6% (n=9) with cTnT between 100-500 ng/l.

Finally, 15.4% (n=4) patients had cTnT 500-1000 ng/l. The two patients who had triple stenting, presented cTnT > 1000 ng/l.

**Conclusions:** There is a remarkable pre-test correlation between cTnT levels and PCI. In addition, overwhelming cTnT levels were more common related to LAD interventions.

Further investigations may improve our understanding of association between troponin levels and coronary injuries.

**Keywords:** cTnT, MI, PCI, LAD,

No. of Patients	Number of Patients without Angiogram or PCI	Number of Patients underwent Angiogram and without PCI	Number of Patients underwent Angiogram and with PCI	Total Number of Patients
	21	36	43	100

**Table 1.** Total Number of patients those who did not receive Angiogram/PCI, those who underwent angiogram but no PCI and those who underwent Angiogram with PCI.

Coronary Vessel Involvement	Total Number	TROPONIN LEVELS/ ng/L 100-500	TROPONIN LEVELS/ ng/L 500-1000	TROPONIN LEVELS/ ng/L 1000+
PCI TO LAD	26	9	4	13
PCI TO LAD And LMS	5	2	1	2
PCI TO LCA	9	4	1	4
PCI TO RCA	15	7	2	6
PCI TO LAD, LCA, RCA	2	0	0	2

Abbreviations – PCI, Percutaneous Coronary Intervention; LAD, Left Anterior Descending Artery; LMS, Left Main Stem Artery; RCA, Right Coronary Artery; LCA, Left Circumflex Artery.

**Table 2.** Total Number of PCI to different Coronary vessel and Troponin Levels.

[Abstract:2897]

## FAMILIAL CHYLOMICRONAEMIA SYNDROME (FCS): AN OBSERVATIONAL STUDY

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The aim of this study was to perform a descriptive analysis of patients with confirmed or very likely familial chylomicronaemia syndrome (FCS) in the Lipid Unit of a tertiary hospital in the last 5 years, according to the criteria of P. Moulin et al. (Atherosclerosis 2018) (1). Data on clinical and analytical manifestations were collected. A sample of 5 patients was obtained. The mean age at diagnosis was 24.13 years (2 months – 46 years), 3 of them were female. All patients had triglycerides above 880 mg/dL at the moment of diagnosis (mean 3160 mg/dL SD 1329) and had a history of unexplained recurring abdominal pain, including visits to the emergency room. 4 patients required admission for acute pancreatitis and all of them had recurrence; plasmapheresis was performed in 2 of them. The genetic study has confirmed the diagnosis in 3 patients so far. Two patients have already started treatment with volanesorsen. FCS is a rare genetic disorder due to the lack of lipoprotein lipase function, leading to severe hypertriglyceridemia with recurrent abdominal pain and a high risk of pancreatitis. Currently, strict and constant restriction of total fat in the diet is the key to treatment, and volanesorsen is the only effective and approved drug therapy.

References:

1- Moulin P, Dufour R, Aversa M, et al. Identification and diagnosis of patients with familial chylomicronaemia syndrome (FCS): Expert panel recommendations and proposal of an “FCS score”. *Atherosclerosis*. 2018 Aug; 275:265-272.

**Keywords:** familial chylomicronaemia syndrome, acute pancreatitis, volanesorsen



**Figure 1.** Plasma from patient 2 after ultracentrifugation.



**Figure 2.** Material obtained after plasmapheresis in an episode of acute pancreatitis from patient 2.

[Abstract:2919]

## ASSOCIATION OF THE LEFT VENTRICULAR GLOBAL FUNCTION INDEX WITH ADHERENCE IN OUTPATIENTS WITH HEART FAILURE

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**Introduction:** Left ventricular global function index (LVGFI) is an imaging marker calculated by cardiac magnetic resonance imaging and echocardiography and is a strong, independent predictor of major adverse cardiovascular events and mortality. Lower LVGFI is associated with higher NYHA functional class. The association of LVGFI with adherence assessed by National Society of Evidence-based Pharmacotherapy Adherence Scale (NSEPAS) and 4-item Morisky Medication Adherence Scale (MMAS-4) is unknown.

**Aim:** To evaluate the association of LVGFI with adherence in outpatients aged 60 years and older with heart failure.

**Materials and Methods:** In total, 34 outpatients with stage C heart failure were included (median age 68 [63-75] years; 33% male) as part of the «PrivAMB+K (Priverzhennost` Ambulatorny`x Bol`ny`x Kardiologicheskogo profilya / Adherence to Cardiology Outpatients)» and «OPTICAMP-KP (Optimizaciya Priverzhennosti Terapii I Komplensa Ambulatorny`x Pacientov Kardiologicheskogo Profilya / Optimizing Therapy Adherence And Compliance in Outpatient Cardiology Patients)» projects. Using echocardiography data for each patient, LVGFI was determined. Adherence was assessed using the NSEPAS and the MMAS-4.

**Results:** The median LVGFI was 24.2 (20.8-27.8)%. In the multiple linear regression model LVGFI was associated with NSEPAS value (Beta: 6.061, 95% CI 2.562-9.559,  $p < 0.002$ ). LVGFI  $\geq 27.8\%$  was associated with lower adherence (NSEPAS) (RR=4.75,  $p < 0.05$ ).

**Conclusions:** LVGFI was associated with NSEPAS. Outpatients aged 60 years and older with heart failure with higher LVGFI has a lower adherence. This can be explained by milder clinical manifestations of heart failure in patients with higher LVGFI.

**Keywords:** heart failure, left ventricular global function index, HF, LVGFI, adherence, compliance

[Abstract:2925]

## HIGHER EXPRESSION LEVEL OF P16 AND P21 SENESENCE PROTEINS IN THE AORTA IS ASSOCIATED WITH HIGHER SYNTAX SCORE IN PATIENTS UNDERGOING BYPASS SURGERY

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**Aim:** The aim of our study is to investigate the relationship between the level of cell aging markers p16, p21 and  $\beta$ -galactosidase and the extent and severity of coronary artery disease.

**Methods:** 112 consecutive prospective patients who had CABG between September 2021 and June 2022 were included in the study. Samples taken from the ascending aorta were analysed p16, p21 and  $\beta$ -galactosidase by immunohistochemical method. Patients were divided into two groups as low ( $\leq 22$ ) and moderate-high ( $> 23$ ) according to the SYNTAX scores showing the complexity of coronary artery lesions. The relationship between SYNTAX score and magnitude of the senescence protein expressions were analysed.

**Results:** The extent and the degree of p16 expression were found to be significantly higher in the moderate-high SS group ( $p=0.015$ ,  $p=0.035$ , respectively). Similarly, extent and grade of p21 expression were also found to be significantly higher in the group with moderate-high SS ( $p=0.015$  and  $p=0.030$ ). However, there was no significant difference between the two groups in terms of  $\beta$ -galactosidase. In multivariate logistic regression analysis, the extent of p16 expression (OR, 1.016 [95% CI, 1.000-1.031];  $P=0.047$ ) was found to be an independent predictor of moderate-to-high SS. The extent of P16 expression indicates the severity of coronary artery disease with a cut-off value of 5.5%, with sensitivity of 66% and specificity of 51%.

**Conclusions:** High p16 and p21 expression were found to be associated with extensive and severe of coronary artery disease. In addition, a low extent of p16 expression is even found as an independent predictor of moderate-to-high SS.

**Keywords:** cellular senescence, p16, p21,  $\beta$ -galactosidase, SYNTAX Score, atherosclerosis

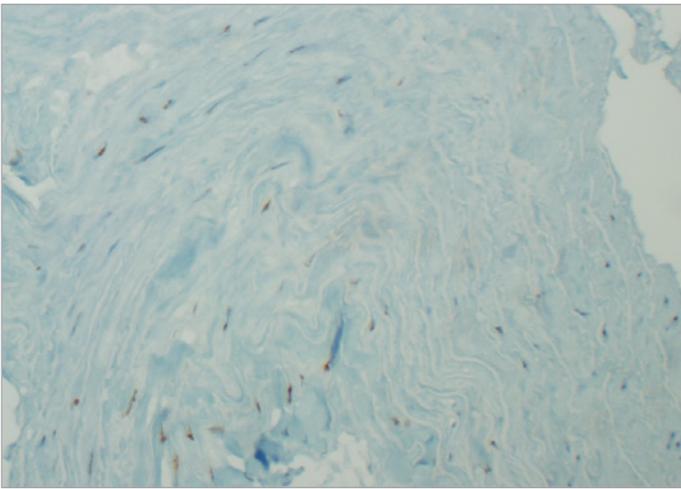


Figure 1.  $\beta$ -Gal tissue sample showing 10% staining.

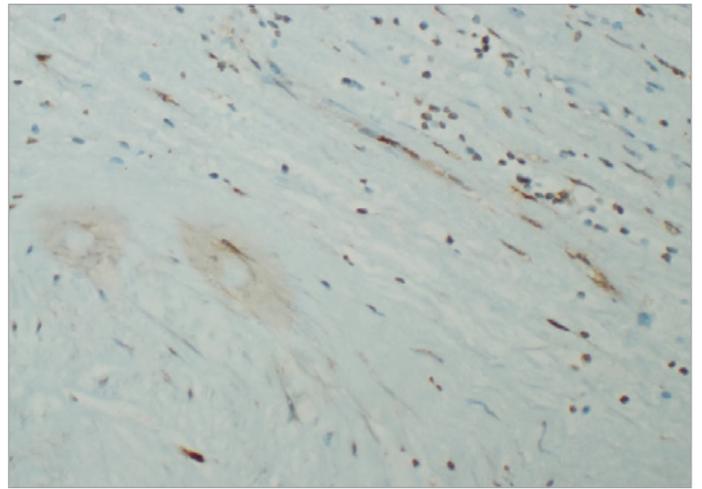


Figure 4. p16 tissue sample showing 50% staining (degree: 2).



Figure 2.  $\beta$ -Gal tissue sample showing 70% staining.



Figure 5. p21 tissue sample showing 5% staining (degree: 1).

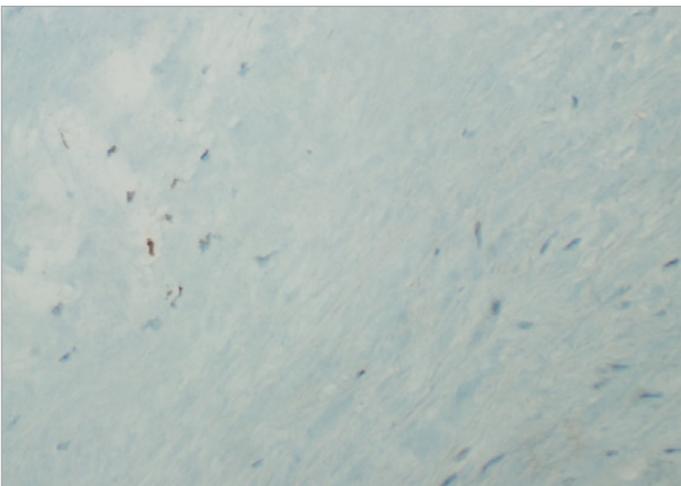


Figure 3. p16 tissue sample showing 5% staining (degree: 1).

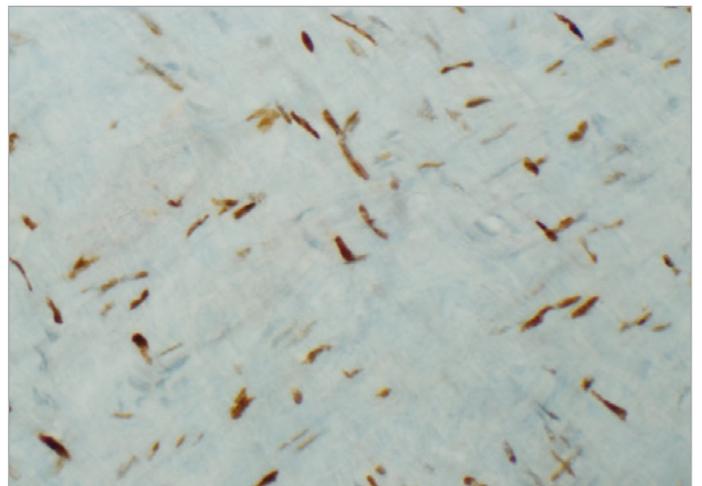


Figure 6. p21 tissue sample showing 50% staining (degree: 2).

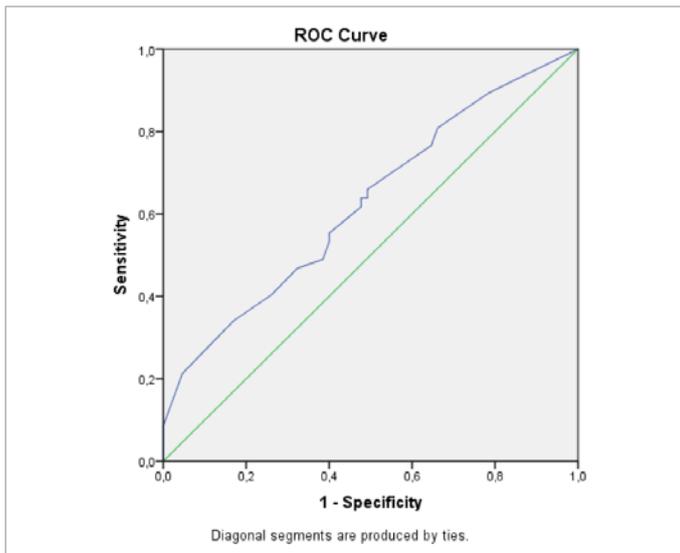


Figure 7. ROC curve showing the power of P16 value in predicting the severity of Coronary artery disease.

Variables	All Patients (n= 112)	Low SYNTAX SCORE (SS) (n=65, 58%)	Moderate-high SYNTAX SCORE(SS) (n=47, 42%)	p
Male gender, n (%)	82 (73.2)	49 (75.4)	33 (70.2)	0.542
Age (Years)	60.6±8.7	59.3±8.6	62.5±8.6	0.058
Hypertension, n (%)	55 (49.1)	33 (50.8)	22 (46.8)	0.679
Diabetes Mellitus, n (%)	61 (54.5)	37 (56.9)	24 (51.1)	0.539
Hyperlipidemia, n (%)	51 (45.5)	32 (49.2)	19 (40.4)	0.356
Family history, n (%)	26 (23.2)	15 (23.1)	11 (23.4)	0.968
Cigarettes, n (%)	48 (42.9)	27 (41.5)	21 (44.7)	0.740
CAD (old diagnosis), n (%)	37 (33)	24 (36.9)	13 (28.3)	0.340
Peripheral Artery Disease, n (%)	12 (10.7)	6 (9.2)	6 (12.8)	0.551
CHF, n (%)	9 (8.0)	3 (4.6)	6 (12.8)	0.117
COPD, n (%)	4 (3.6)	2 (3.1)	2 (4.3)	0.740
CKD, n (%)	2 (1.8)	0 (0.0)	2 (4.3)	0.093
SVO, n (%)	11 (9.8)	5 (7.7)	6 (12.8)	0.373
ASA, n (%)	58 (51.8)	35 (53.8)	23 (48.9)	0.608
Dual antiplatelet, n (%)	13 (11.6)	7 (10.8)	6 (12.8)	0.745
Oral Anticoagulant, n (%)	1 (0.9)	0 (0)	1 (2.1)	0.237
ACEI/ARB	46 (41.1)	30 (46.2)	16 (34)	0.199
Beta-Blocker, n (%)	41 (36.6)	24 (36.9)	17 (36.2)	0.935
KKB, n (%)	13 (11.6)	10 (5.4)	3 (6.4)	0.142
Statin, n (%)	37 (33)	23 (35.4)	14 (29.8)	0.534
Acute Coronary Syndrome, n (%)	55 (49.1 %)	28 (43.1%)	27 (57.4)	0.133
LVEF, n (%)	52.1±7.9	53.7±7.0	49.9±8.5	0.010
Retrograde Approach, n (%)	38 (33.9)	21 (32.3)	17 (36.2)	0.313
Postop AF, n (%)	13 (11.6)	6 (9.2)	7 (14.9)	0.356
Mortality (1 Year), n (%)	11(9.8)	1 (1.5)	10 (21.3)	0.001
MACE, n (%)	22 (19.6)	2 (3.1)	20 (42.6)	<0.001
Intensive care stay (days), median, [IQR]	4.0 [3.0-5.0]	4.0 [3.0-5.0]	4.0 [3.0-6.0]	0.107
Follow-up time (total days), median, [IQR]	355.0 [292.3-424.0]	367.0 [301.5-424.0]	335.0 [276.0-425.0]	0.022

Table 1. Basic demographic and clinical characteristics of the study group.

Variables	All Patients (n= 112)	Low SYNTAX SCORE (SS) (n=65, 58%)	Moderate-high SYNTAX SCORE(SS) (n=47, 42%)	p
Fasting Blood Glucose, mg/dL, median, [IQR]	126.5 [101.0-158.5]	126.0 [101.0-161.5]	127.0 [99.0-157.0]	0.528
Creatinine, mg/dL, median, [IQR]	0.82 [0.72-0.96]	0.81 [0.72-0.90]	0.82 [0.73-1.04]	0.174
Total Cholesterol, mg/dL	185.9±52.6	189.5±52.6	180.9±52.7	0.401
LDL-C, mg/dL	112.9±45.2	117.4±46.5	106.7±43.2	0.217
HDL-C, mg/dL	40.4±10.4	41.7±11.1	38.6±9.1	0.116
TG, mg/dL, median, [IQR]	182.5 [147.0-214.0]	152.0 [101.5-190.0]	156.0 [124.0-217.0]	0.323
Uric Acid, mg/dL, median, [IQR]	4.3 [3.5-5.5]	4.2 [3.5-5.2]	4.8 [3.5-6.1]	0.074
Albumin, g/dL	4.1±0.44	4.2±0.47	4.1±0.41	0.889
Preop Troponin T, pg/mL	7.0±0.68	7.0±0.65	7.0±0.73	0.991
CRP, mg/L, median, [IQR]	4.3 [2.0-11.9]	3.6 [1.7-8.9]	6.1 [2.4-18.0]	0.028
Preop WBC, 10 <sup>3</sup> /μL	8.4±2.3	8.4±2.2	8.3±2.4	0.181
Neutrophil, 10 <sup>3</sup> /μL	5.6±2.0	5.8±1.8	5.5±2.2	0.301
Lymphocyte, 10 <sup>3</sup> /μL	2.1±0.6	2.1±0.7	2.0±0.9	0.915
Preop PLT, 10 <sup>3</sup> /μL	241±82	237±68	247±98	0.515
Preop Hemoglobin, g/L	13.5±2.0	13.6±1.2	13.2±2.3	0.201
RDW, (%)	13.7±1.2	13.8±1.2	13.6±1.1	0.316
Postop Hemoglobin, g/dL	9.4±1.8	9.4±1.9	9.3±1.7	0.704
Postop Hemoglobin, g/dL	11.4±3.4	11.8±3.6	10.8±3.2	0.130
Postop WBC, 10 <sup>3</sup> /μL	182±58	191±59	170±55	0.049
Postop creatinine, mg/dL, median, [IQR]	0.90 [0.80-1.20]	0.90 [0.70-1.10]	0.90 [0.80-1.20]	0.087
Postop troponin T, pg/mL	416 [289-701]	380 [285-594]	476 [313-1000]	0.007
β-gal. (%)	59.4 ± 15.6	58.3 ± 15.6	60.9 ± 15.7	0.371
P16, (%), median, [IQR]	10.0 [1.0-40.0]	5.0 [1.0-40.0]	15.0 [5.0-60.0]	0.015
P16 degree, median, [IQR]	1.0 [1.0-2.0]	1.0 [0.0-2.0]	1.0 [1.0-2.0]	0.035
P21, (%), median, [IQR]	13.3 [5.9-39.2]	10.0 [5.0-30.0]	23.3 [8.3-46.7]	0.015
P21 degree, median, [IQR]	1.0 [1.0-2.0]	1.0 [1.0-2.0]	2.0 [1.0-2.0]	0.030

Table 2. Hematological and biochemical parameters of the study group.

Variables	All Patients (n= 112)	Low SYNTAX SCORE (SS) (n=65, 58%)	Moderate-high SYNTAX SCORE(SS) (n=47, 42%)	p
LMCA, n (%)	29 (26.1)	17 (26.6)	12 (25.5)	0.903
LAD, n (%)	104 (93.7)	58 (90.6)	46 (97.9)	0.121
Cx, n (%)	94 (84.7)	56 (87.5)	38 (80.9)	0.337
RCA, n (%)	87 (78.4)	48 (75.0)	39 (83.0)	0.313
SYNTAX score I	21.9±7.1	17.1±3.6	28.5±5.2	<0.001

Table 3. Coronary angiographic findings and severity of coronary artery disease in the study population.

Variables	Univariate OR (95% CI)	p	Multivariate 1 OR (95% CI)	p	Multivariate 2 OR (95% CI)	p
LVEF	0.938 (0.892-0.987)	0.013	0.942 (0.892-0.995)	0.031	0.931 (0.881-0.984)	0.012
CRP	1.036 (1.002-1.072)	0.040	1.021 (0.984-1.059)	0.267	1.018 (0.982-1.056)	0.335
P21, (%)	1.025 (1.004-1.047)	0.017	1.019 (0.997-1.042)	0.090	-	-
P16, (%)	1.017 (1.003-1.032)	0.018	1.016 (1.000-1.031)	0.047	-	-
P21 degree	1.937 (1.055-3.555)	0.033	-	-	1.947 (0.972-3.900)	0.060
P16 degree	1.740 (1.033-2.932)	0.037	-	-	1.453 (0.819-2.580)	0.202

Table 4. Factors found to be independently associated with coronary artery disease severity in univariate and multivariate logistic regression analysis.

[Abstract:2971]

## ENDOCRINOPATHY OF TAKO-TSUBO

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A 59-year-old woman, a smoker with a 12-pack-year history and asthma, presented to the emergency department with one-hour oppressive central chest pain. During her stay, she had cardiac arrest, requiring advanced CPR and successful electrical reversion of ventricular tachycardia. Subsequent ECG (Figure 1)

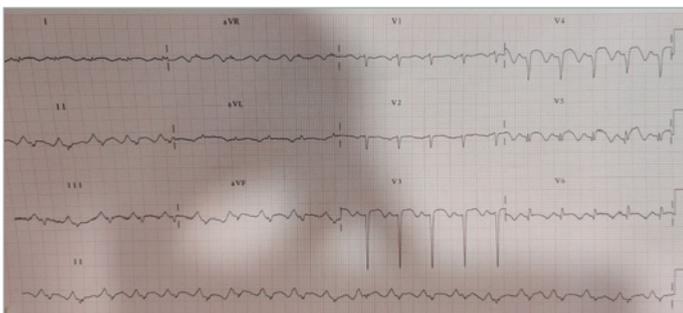
showed ST elevation in the inferior and septal regions, activating the Infarction Code. Coronary angiography revealed no significant lesions, while left ventriculography indicated akinesia (Figure 2), consistent with Tako-Tsubo cardiomyopathy.

After stabilization in ICU and transfer to ward, the patient reported anxiety, tremors, sweating, and a weight loss of >20 kg in the last 3 months. Additional tests included routine blood work, revealing abnormal thyroid levels, thyroid ultrasound showing an enlarged thyroid, and echocardiography and cardiac MRI showing no abnormalities in segmental contractility, oedema, or myocardial fibrosis/necrosis.

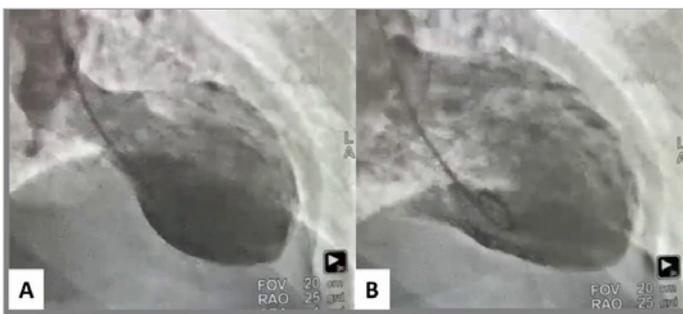
The diagnosis of cardiac arrest secondary to Tako-Tsubo syndrome in the context of Graves' disease thyrotoxicosis was established. During her hospital stay, the patient-initiated beta-blocker and antithyroid treatment, exhibiting excellent clinical progress and discharge home.

Tako-Tsubo syndrome (TTS), characterized by acute ventricular systolic dysfunction without significant obstructive coronary artery disease, involves dysregulated catecholamines. Thyroid hormones, oestrogen, and cortisol are implicated in its pathophysiology. Although rare, thyrotoxicosis has been identified as a cause of TTS, with timely hyperthyroidism treatment leading to complete cardiac recovery. In conclusion, catecholamine dysregulation in thyroid storm may induce stress-induced cardiomyopathy. Early identification of this underlying endocrine disorder allows interventions preventing ongoing myocardial damage, offering the best chance of recovery from this reversible heart failure cause.

**Keywords:** Tako-Tsubo syndrome, thyrotoxicosis, graves' disease



**Figure 1.** Electrocardiogram after electrical cardioversion: ST segment elevation in the inferior and septal regions.



**Figure 2.** Ventriculography in systole (A) and in diastole (B): anterior and extensive diaphragmatic akinesia.

[Abstract:2979]

## HIF-PH INHIBITORS - THE NEW WEAPON IN CARDIO-RENAL-ANEMIA

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The pathologic triangle, which is formed by anaemia, chronic renal disease, and chronic heart failure, has high rates of morbidity and death, and lowers quality of life. Anaemia, which ranges in prevalence in CRS from 5% to 55%, is a prevalent complication among individuals with severe heart failure and chronic kidney disease. The main focus of research for ongoing treatment trials is finding a practical strategy for these patients that goes beyond simply targeting haemoglobin therapy behaviour, with guided and disease-specific recommendations.

It is commonly recognised that when heart failure and chronic kidney disease worsen, anaemia becomes more common.

Recent research has highlighted the difficulties in treating individuals with cardio-renal anaemia syndrome (CRSA), leading to the development of novel therapeutic drugs such as hepcidin antagonists or HIF-PH inhibitors.

Given their ability to raise haemoglobin without causing elevated EPO levels, HIF-PH inhibitors are a reasonable therapy option for anaemia in patients with both heart failure and chronic kidney disease.

Recent literature states that the following conditions are treated using HIF stabilisers in clinical practice: MIA syndrome, ESA-resistant anaemia, and cardio-renal anaemia syndrome.

Numerous research investigations have demonstrated the advantageous effects of daprodustat, roxadustat, vadadustat, molidustat, desidustat, and enarodustat on the syndrome of cardio-renal anaemia.

**Keywords:** HIF-PH inhibitors, anaemia, cardio-renal syndrome

[Abstract:2991]

## METASTATIC RENAL CELL CARCINOMA PRESENTING AS AN INTRACARDIAC TUMOUR WITHOUT INVOLVING THE INFERIOR VENA CAVA

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Renal cell carcinoma (RCC) is an aggressive tumour, with 25% of the cases presenting with distant metastases at the time of diagnosis. Approximately 33% of the patients with RCC eventually develop metastatic spread. RCC can metastasize to various sites including

the lung, liver, bone, brain, adrenal gland, and more. Cardiac metastasis is rare in RCC, but even rarer in the absence of inferior vena cava (IVC) involvement. This case report presents a 60-year-old male patient who was referred by his general practitioner due to breathing difficulties. An initial echocardiogram revealed a right ventricular outflow tract obstruction caused by a mass. A subsequent cardiac MRI showed a right ventricular mass with features suggestive of a metastatic spread. A CT scan of the thorax, abdomen and pelvis was done to ascertain the primary tumour which revealed RCC, without involving the IVC. Due to the presence of metastases, advanced disease, and heavy tumour burden, the multidisciplinary team concluded that there were almost negligible treatment options available at that stage and recommended the best supportive care and community hospice support. The patient was discharged once his symptoms improved, as per his request, and he passed away peacefully at home within a month. This case highlights the very rare occurrence of cardiac metastasis of RCC without IVC involvement. It also illustrates the approach and investigations involved in the evaluation of complex cardiac masses.

**Keywords:** abdomen and pelvis, CT chest, cardiac MRI (CMR), inferior vena cava (IVC), cardiac metastasis, renal cell carcinoma (RCC)



**Figure 1.** Large mass (arrow) adjacent to the anterior free wall with right ventricular outflow tract obstruction.

RCC has a high inclination towards venous invasion. RCC can invade through the renal vein into the IVC, and can then extend into the lumen, with tumour-thrombus complex formation occurring in about 5% to 15% of all cases. The tumour can sometimes extend right up to the right cardiac chambers as well from there in about 1% of the cases. There are four stages of this tumour thrombus extension to the heart; type I involves the intravascular tumour reaching the renal vein but not the IVC, type II involves the IVC being occupied up to the level of the hepatic veins, while in types III and IV the IVC above the diaphragm and, subsequently, the right cardiac chamber are involved. In almost all of the cases, this spread to the right.



**Figure 2.** L kidney mass (arrow on right) and that the inferior vena cava (arrows on the left) appears thrombus/tumour-free.

While primary cardiac tumours are rare, cardiac metastases are common and represent up to 9% of the intracardiac masses. These are a result of either direct extension or haematogenous or lymphatic spread. Here, we present a case of an RV tumour without involvement of the IVC or renal veins, which is extremely rare.



**Figure 3.** Lytic lesion at the T7 vertebra (arrow).

CT abdomen and pelvis was done to rule out any underlying malignancy, Lytic lesions was noted in the vertebra.



Figure 4. Bulky right ventricular mass that is causing the right ventricular outflow tract obstruction.

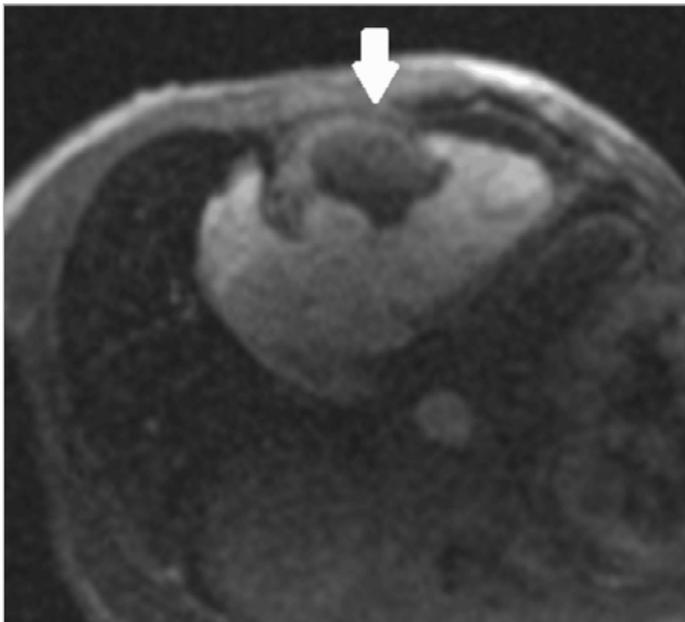


Figure 5. Perfusion scan in cardiac MRI showed subtle heterogeneous enhancements, highly favouring the diagnosis of metastases rather than thrombus.

[Abstract:3011]

## MICRORNAS IN TAKO-TSUBO SYNDROME – A NEW DIAGNOSTIC AND PROGNOSTIC TOOL

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Tako-Tsubosyndrome(TS)isaclinicalentitywithanunderestimated prevalence of 1-2.5% of the patients with suspected acute coronary syndrome. Although clinical presentation and severe left ventricular dysfunction are similar between these two entities, TS differs from an acute coronary syndrome because patients have generally a normal coronary angiogram and left dysfunction, which extends beyond the territory subtended by a single coronary artery and recovers within days or weeks. The prognosis is worse than initially described with mortality reported during the acute phase in hospitalized patients of 4-5%. Despite extensive research, the cause and pathogenesis of TS remain incompletely understood.

Early and prompt diagnosis is of great importance regarding the prognosis of TS in the acute and chronic phase. In recent years, microRNAs (miRNA) have emerged as promising tools involved in many pathophysiological processes in various fields, including cardiovascular diseases. In TS, circulating levels of miRNA are significantly elevated, as an indicator of cardiac dysfunction, making them a promising marker of early diagnosis of TS. They also have prognostic value and great potential as therapeutic targets considering they key function in gene regulation. This review aims to summarize current information about miRNAs and their role as diagnostic and prognostic biomarkers in TS patients.

**Keywords:** Tako-Tsubo syndrome, miRNAs, biomarkers, diagnosis, prognosis