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A CASE OF PARVOVIRUS B19 INFECTION MIMICKING MUMPS VIRUS INFECTION IN A HEALTHY ADULT

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ABSTRACT

Introduction: Human parvovirus B19 infection classically manifests as erythema infectiosum in children, but in adults the clinical spectrum is diverse and often atypical. While transient neutropenia and bone marrow suppression have been reported, mumps-like submandibular swelling is rarely described in immunocompetent adults.

Case description: We report a 38-year-old previously healthy man who presented with high fever and febrile neutropenia. Physical examination revealed pronounced bilateral submandibular swelling without parotid involvement. The patient's child had had a recent febrile illness, raising suspicion for mumps virus infection; however, serology for mumps antibodies was negative. Empiric therapy with intravenous meropenem was initiated. The patient's symptoms and neutropenia resolved promptly. Extensive evaluation for infectious and hematologic diseases was negative, but polymerase chain reaction for parvovirus B19 in blood was positive. The clinical course was favourable without complications.

Discussion: This case highlights a rare presentation of acute parvovirus B19 infection in a healthy adult male, characterized by febrile neutropenia and mumps-like bilateral submandibular swelling. Although most adult parvovirus B19 infections present with arthralgia and rash, clinicians should consider parvovirus B19 as a differential diagnosis in adults presenting with unexplained neutropenia and salivary gland swelling, even in the absence of anaemia or typical rash. The possibility of parvovirus B19 should be especially considered when there is a history of contact with children displaying febrile illness. Early recognition may prevent unnecessary broad-spectrum antibiotic use and guide appropriate management.

Conclusion: Parvovirus B19 infection in immunocompetent adults can manifest with atypical features such as febrile neutropenia and submandibular gland swelling resembling mumps. A high index of suspicion and appropriate virological testing are essential for accurate diagnosis and management.

KEYWORDS

Human parvovirus B19, febrile neutropenia, mumps-like submandibular swelling

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LEARNING POINTS

- Parvovirus B19 infection can present atypically in immunocompetent adults, mimicking mumps with febrile neutropenia and submandibular swelling.
- Clinicians should include parvovirus B19 in the differential diagnosis of unexplained neutropenia accompanied by salivary gland enlargement.
- A recent history of contact with febrile children may provide a valuable clue to parvovirus B19 infection.

INTRODUCTION

Human parvovirus B19 is widely recognized as the causative agent of erythema infectiosum. In children, the infection typically presents with an initial febrile phase followed by a characteristic "slapped-cheek" rash, which is highly indicative of this disease. However, the clinical manifestations of parvovirus B19 infection in adults differ markedly from those seen in children. Adults more commonly exhibit symptoms such as fever and arthralgia, which often lead clinicians to include autoimmune diseases such as systemic lupus erythematosus (SLE) and rheumatoid arthritis (RA) in the differential diagnosis[1]. While rash is comparatively less frequent and less typical in adults, there have been reports of cases presenting with a distinctive rash known as "papular purpuric gloves and socks syndrome"[2].

From a hematologic perspective, parvovirus B19 is well known for infecting erythroid precursor cells in the bone marrow, often resulting in anaemia. Although less common, cases of leukopenia, neutropenia[3], and thrombocytopenia[4] have also been documented.

Among viral infections causing salivary gland swelling, mumps virus remains the prototypical agent. Mumps can sometimes be accompanied by leukopenia[5]. In contrast, parvovirus B19 has not been widely recognized as a cause of salivary gland swelling or such hematologic abnormalities. In this report, we describe a case of a previously healthy adult male who developed febrile neutropenia and bilateral salivary gland swelling mimicking mumps, with a diagnosis of parvovirus B19 infection inferred from a history of classic erythema infectiosum in his child.

CASE DESCRIPTION

A previously healthy 38-year-old man was referred to our hospital with a 10-day history of fever. The patient had been well until 10 days prior to admission, when he began to experience generalized fatigue and a persistent fever. Four days before presenting to our hospital, he visited a local clinic. Rapid antigen tests for influenza and coronavirus disease 2019 both returned negative, and he was subsequently diagnosed with a common cold. Acetaminophen was prescribed for symptomatic management, and the patient was advised to monitor his symptoms. Despite these measures, he continued to have daily fevers reaching 39°C and, 2 days prior to his admission, sought care again. Laboratory evaluation revealed a white blood cell count of 1,000/μl, red blood cell count 4.6 ×10⁶/μl, and platelet count of 157,000/μl, with significant leukopenia. He was thereafter referred to our hospital for further evaluation and management of febrile neutropenia.

On arrival, the patient appeared mildly ill but stable. He reported bilateral jaw pain, with tenderness particularly over both neck regions. His past medical history was unremarkable. Notably, he had contact with his sick 3-year-old child, who reportedly had rhinorrhoea. There was no history of recent animal contact, travel, unusual dietary exposures, or sexual activity. Vital signs were: heart rate 90 bpm, blood pressure 116/72 mmHg, respiratory rate 24/min, temperature 39.7°C, and oxygen saturation 96% on room air. Physical examination revealed bilateral salivary gland swelling with palpable cervical lymphadenopathy. No additional lymphadenopathy or hepatosplenomegaly was present. Laboratory findings at admission demonstrated severe neutropenia; peripheral blood smear did not show blasts or signs of phagocytosis *(Table 1)*. Contrast-enhanced computed tomography scan of the neck demonstrated bilateral submandibular gland enlargement *(Fig. 1)*. In light of the paediatric sick contact history and the patient's neutropenia and fever, mumps virus infection and Sjögren's syndrome were considered as possible diagnoses. Corresponding serological tests, as well as blood, urine, and sputum cultures, were submitted, and empiric intravenous



Figure 1. Contrast-enhanced computed tomography scan of the neck obtained on admission demonstrates bilateral submandibular gland enlargement (red arrows).

Biochemistry	
Test	Result
AST (U/l)	25
ALT (U/l)	24
ALP (IFCC) (U/l)	62
T-bil (mg/dl)	0.6
CK (U/l)	96
LDH (IFCC) (U/l)	193
BUN (mg/dl)	9.1
Cre (mg/dl)	0.89
Na (mmol/l)	135
K (mmol/l)	4.1
Cl (mmol/l)	95
Mg (mg/dl)	2.3
TSH (mIU/l)	1.06
IgA (mg/dl)	262
IgG (mg/dl)	1441
IgM (mg/dl)	142
CH50 (U/ml)	46.1
Fe (µg/dl)	124
Ferritin (ng/ml)	719
IL-2R (U/ml)	1491
ANA	-
SS-A	-
Mumps IgM	±
Mumps IgG	-
Peripheral venous blood gas	
Test	Result
pH	7.42
PCO_2 (mmHg)	44.1
PO_2 (mmHg)	39.1
HCO_3 - (mmol/l)	28.9
Lactate (mmol/l)	1
Glu (mg/dl)	87

Complete blood count	
Test	Result
WBC (cells/µl)	980
Neutro (cells/µl)	160
Lymph (cells/µl)	540
Hb (g/dl)	15.1
Plt (cells/µl)	165 ×10^4

Abbreviations: WBC, white blood cells; neutro, neutrophils; lymph, lymphocytes; Hb, haemoglobin; MCV, mean corpuscular volume; Plt, platelets; AST, aspartate transaminase; ALT, alanine transaminase; ALP, alkaline phosphatase; IFCC, International Federation of Clinical Chemistry and Laboratory Medicine; T-bil, total bilirubin; CK, creatine kinase; LDH, lactate dehydrogenase; BUN, blood urea nitrogen; Cre, creatinine; TSH, thyroid stimulating hormone; CH50, homolytic complement activity; Fe, iron; sIL-2R, soluble interleukin-2 receptor; ANA, antinuclear antibody; SS-A, anti-SS-A/Ro antibody.

Table 1. Laboratory data on admission.

cefepime (6 g/day) was started. The patient was admitted for close monitoring.

During hospitalization, the patient's fever spontaneously resolved, and improvement in laboratory parameters was documented through hospital day 7. His clinical status was deemed stable, and he was discharged home. Serological testing for mumps subsequently showed equivocal IgM and negative IgG. At the post-discharge follow-up visit, it was reported that his 3-year-old child had developed fever and later a classic course of erythema infectiosum. This prompted additional evaluation of the patient's previously stored blood samples, which returned positive for parvovirus B19 IgM antibodies and parvovirus B19 deoxyribonucleic acid (DNA) by polymerase chain reaction, confirming the diagnosis. Repeat blood testing after discharge showed resolution of neutropenia *(Table 2)*, and no new symptoms developed.

DISCUSSION

Parvovirus B19 is a DNA virus belonging to the Parvoviridae family and is the only parvovirus known to infect humans. It is transmitted primarily by respiratory droplets, with outbreaks of erythema infectiosum characteristically observed among children. While the classic presentation of parvovirus B19 infection is well described in paediatric populations, the virus is known to cause a variety of clinical manifestations depending on the age and immune status of the host. In immunocompromised patients, chronic infection or prolonged anaemia may occur, and there have also been reports of neutropenia similar to that observed in the present case[6]. However, reports of neutropenia due to B19 infection in otherwise healthy adults are extremely rare[7]. Importantly, the present case had no exposure to fibrin glue preparations derived from pooled human plasma, which is a risk factor in some previously reported adult cases[8].

Given these findings, parvovirus B19 should be considered in the differential diagnosis of febrile neutropenia, even though

	Day 1	Day 2	Day 3	Day 4	Day 6
WBC (cells/μl)	980	1650	2000	2410	3730
Neutro (cells/μl)	160	170	480	880	1610
Hb (g/dl)	15.1	14.6	13.9	13.2	12.9
Plt (×10^4/μl)	16.5	13.5	13.9	16.3	26.2

Abbreviations: WBC, white blood cells; neutron, neutrophils; Hb, haemoglobin; Plt, platelets.

Table 2. Changes in blood count after hospitalization.

its frequency in otherwise healthy adults is exceptionally low. In addition, this case was notable for the presence of bilateral submandibular gland swelling mimicking mumps virus infection. As reported in the case description, the coexistence of a child with fever at home and the patient's bilateral glandular swelling made mumps virus infection an easy initial assumption. Furthermore, as mumps virus itself is known to occasionally cause neutropenia[5], this contributed to a delay in the definitive diagnosis.

A review of the PubMed literature using the keywords "parotitis AND parvovirus B19" revealed only a single report of paediatric patients[9], with no published of adults with parvovirus B. These considerations suggest that even though parvovirus B19 infection is rare in adults, it should be included in the differential diagnosis of mumps-like syndromes and febrile neutropenia. This case underscores the need for clinicians to be vigilant for parvovirus B19 infection in adults presenting with these overlapping features.

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