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Epstein–Barr Virus-induced Meningitis-Retention Syndrome

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ABSTRACT

Meningitis-retention syndrome (MRS) is a rare disorder where aseptic meningitis is accompanied by urinary retention, which can be easily misdiagnosed as urinary tract infection. We present the case of a 55-year-old man with fever and dysuria. At the time of hospitalization, the patient had no symptoms of meningitis, but signs of meningeal irritation appeared later during the course of the disease. Investigation revealed that this was a case of MRS due to Epstein–Barr virus. We have to consider MRS when examining patients with fever and urinary retention, as dysuria may precede meningitis symptoms.

LEARNING POINTS

- Meningitis-retention syndrome (MRS) is a rare disorder where aseptic meningitis is accompanied by urinary retention, which can be easily misdiagnosed as urinary tract infection.
- MRS should be considered when examining patients with fever and urinary retention, as dysuria may precede the meningitis symptoms.
- The presence of Epstein–Barr virus can also complicate MRS.

KEYWORDS

Meningitis-retention syndrome, aseptic meningitis, acute urinary retention, Epstein–Barr virus

CASE DESCRIPTION

A 55-year-old man presented to our hospital with fever and dysuria. Seven days before admission, he had experienced fever and urinary hesitancy. He had been diagnosed by his local physician with a urinary tract infection and had received oral antibiotic treatment. However, his fever had not resolved, and a weak urine stream and frequent urination were noted. The patient also had hypertension but was not taking any medication for this. He had a Glasgow Coma Scale score of 15, body temperature of 39.8°C, blood pressure of 150/82 mmHg, heart rate of 90 beats per minute, respiratory rate of 12 breaths per minute, and an SpO_2 of 99% in room air. Upon physical examination, there were no abnormalities on chest auscultation, no costovertebral angle tenderness and no prostate tenderness. No apparent neurological abnormalities were found. He had no neck rigidity. Brudzinski's sign, Kernig sign's and left–right differences in the upper and lower limb tendon reflexes were absent.

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METHODS AND PROCEDURES

Laboratory data on admission revealed hyponatremia (Na, 125 mEq/l) but no inflammatory response (white blood cell count, 4,900/µl; C-reactive protein, 0.1 mg/dl). Urinalysis showed no evidence of infection and no source of infection was identified. The patient was admitted to hospital. The next day, he had difficulty urinating and retained urine in the bladder, which indicated urinary retention as the cause of the slow and frequent urination, and received treatment for urine induction. On the third day of hospitalization, the patient presented with involuntary movements of the extremities, nuchal rigidity, bilaterally symmetrical generalized hyperreflexia of the deep tendon reflexes, and pathological reflexes in the bilateral lower extremities. A lumbar puncture was performed on the fourth day to investigate the fever and disorientation. Cerebrospinal pressure was elevated at 260 mmCSF, the cell count was significantly raised at 143/µl with mononuclear cells being dominant, and protein content was increased at 121 mg/dl. These findings led to a diagnosis of urinary retention due to meningitis-retention syndrome (MRS) with aseptic meningitis. A urinary catheter was then inserted.

Differential diagnosis work-up for aseptic meningitis included a positive polymerase chain reaction (PCR) test for Epstein–Barr virus (EBV) in spinal fluid. EBV DNA quantification demonstrated 920 copies/ml. A serum EBV antibody titre test showed a <10-fold increase in EBV VCA IgM, a <40-fold increase in EBV VCA IgG, and positive anti-EBNA antibody, suggesting a pre-existing infection pattern. Accordingly, EBV reactivation was identified as the cause of MRS. There were no findings or blood test data suggestive of tuberculosis or other viral, fungal, autoimmune or malignant aetiologies. After treatment with antiviral drugs and steroid pulse therapy, and the patient's symptoms completely resolved.

DISCUSSION

This was a case of MRS due to EBV reactivation in a healthy adult with meningitis symptoms preceded by dysuria. MRS is a relatively rare disorder involving aseptic meningitis and urinary retention which, but in most cases the cause is unknown [1]. Although its pathogenicity is still unclear, MRS is similar to Elsberg syndrome where urinary retention is caused by spill over from local genital infection by the herpes simplex virus [2]. The causes of urinary retention include sacral nerve root damage due to direct viral inflammation, transient sphincter damage, and post-infection damage to the peripheral and central nervous systems. It was reported that inflammation and demyelination are associated with EBV infection [3].

EBV infections can be classified as lytic or latent. The transition of B cells from the latently infected state to lytic infection causes reactivation of EBV infection [4]. EBV is partly lytic and mostly in a latent state of infection, regardless of tissue location. Its reactivation may be strongly promoted in immunosuppressed patients when a threshold is exceeded. However, the stimuli and bioactive substances that induce or inhibit reactivation in vivo are unknown [4].

Investigation of this case revealed that the cause of MRS was EBV reactivation. There are no reports of MRS secondary to EBV reactivation among immunocompetent patients. Although the mechanism of EBV reactivation in healthy individuals is unknown, damage to the central nervous system was reported in diseases induced by EBV reactivation, including meningitis [5].

The reactivation could possibly result in MRS. EBV VCA IgG detection is not as sensitive and specific as EBV DNA detection in spinal fluid. Therefore, quantitative testing of EBV DNA in spinal fluid is necessary to confirm EBV infection. It may also be considered in cases of MRS of unknown origin.

In this patient, EBV VCA IgG was not found in spinal fluid, although during the recovery period, PCR testing for EBV in spinal fluid changed from positive to negative.

In the present case, the dysuria, which preceded symptoms of meningeal irritation, complicated the diagnosis because it required exclusion of urinary tract infection.

Frequent and persistent urination is ordinarily present in urinary tract infections. However, the same symptoms are also suggestive of residual urine in the bladder due to urinary retention. Therefore, a thorough abdominal examination and ultrasonography are important in order to make a diagnosis.

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