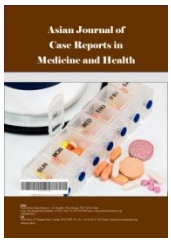

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Aseptic Meningitis with Acute Urinary Retention

Nikhil Teja Kambhampati [a*#], Renoy Henry [a†] and Akash Thomas Oommen [a‡]

[a] *Department of Internal Medicine, Amrita Institute of Medical Sciences and Research Center, Kochi, India.*

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Aim: The clinical importance of acute urinary retention in aseptic meningitis.
Case Presentation: A 19-year-old male presented to us with signs and symptoms suggestive of meningitis. He later developed urinary retention. MRI of the brain with contrast was normal. Cerebrospinal fluid (CSF) analysis was consistent with aseptic meningitis. However, the meningoencephalitis panel was reported as negative. Urinary retention in the context of meningitis is known as Meningitis retention syndrome (MRS). MRS is a rare but important complication of meningitis. Early treatment with antiviral therapy resulted in a favorable outcome for our patient.
Conclusion: MRS is a rare self-limiting unique neuro-urological condition. The awareness of MRS and its clinical course is important for both neurologists and urologists in preventing unnecessary investigation and treatment, thereby reducing patients' anxiety.

Keywords: Urinary retention; meningitis; CSF; urological emergency.

1. INTRODUCTION

"Acute urinary retention is a urological emergency" [1]. "Urinary retention is common in elderly men and is attributed to prostate hypertrophy" [2]. "However, urinary retention is uncommon in children, young adults, and women, and may reflect a neurological disorder" [3].

[#] *Postgraduate;*
[†] *Clinical Associate Professor;*
[‡] *Clinical Professor;*
**Corresponding author: E-mail: nikhilteja8@gmail.com;*

"Urinary retention resulting from a neurological etiology is less common in men. Obstruction is the usual etiology in men" [4].

"The causes of neurogenic urinary retention may be divided into three main categories: cortical and subcortical lesions, spinal cord lesions above the conus medullaris, and lesions of the conus medullaris and motor and sensory nerves to the bladder" [5].

"The development of urinary retention in the context of meningitis and CSF pleocytosis without any lumbosacral radiculomyelitis is known as Meningitis Retention Syndrome (MRS)" [6]. "This entity presents with fever, headache, stiff neck, and minor pyramidal signs with urinary retention. MRS is rare with only a few case reports documented so far in literature"[3,6,7].

We report a rare presentation of aseptic meningitis with acute urinary retention.

2. CASE PRESENTATION

A 19-year-old male, with no known comorbidities, was admitted to the department of general medicine with a one-week history of high-grade fever with chills. He also had a severe headache for four days. On examination, he was fully conscious (Glasgow Coma Scale 15/15) and his vital parameters showed a temperature of 101˚ F, pulse rate of 98/min, blood pressure of 120/70 mm hg, respiratory rate of 22/min, and O_2 saturation of 98% at room air. Examination of the nervous system showed terminal neck rigidity with no other signs of meningeal irritation (Kernig's and Brudzinski's negative). The rest of his neurological examination revealed no abnormalities. Other systems were within normal limits. Initial blood investigations were within normal limits (Table 1). Blood and urine cultures showed no growth. In view of severe headache and suspicion of papilledema, an ophthalmology consultation was sought and they opined as bilateral evolving papilledema. Meningitis was considered and MRI Brain with contrast (Image.1) was taken, showing no meningeal enhancement. On the second day, he started complaining of reduced urine output and abdominal pain. Per abdominal examination revealed a full bladder. Meanwhile, he had difficulty in initiating micturition but reported having an urge to pass urine. Given painful urinary retention, foley's catheterization was done. Around 1.2 L of urine was drained immediately post-catheterization. An ultrasound abdomen was done and was found to be normal. MRI spine was planned to rule out the causes of urinary retention but was withheld due to financial constraints. During his stay in the hospital, he had persistent hiccups, for which he was started on prokinetic (Metoclopramide 10mg thrice daily) and muscle relaxant (Baclofen 5mg twice daily). A lumbar puncture was performed and cerebrospinal fluid (CSF) analysis revealed a white blood cell (WBC) count of 315 per mm3 with lymphocytic predominance and elevated protein levels (Table 2). CSF cultures showed no growth. CSF analysis was suggestive of viral meningitis, and he was started on Inj acyclovir (500mg intravenous every eight hours), ceftriaxone (2gm intravenous every twelfth hour), and steroids (dexamethasone 4mg intravenous every eight hours). CSF was sent for the Meningoencephalitis panel (Table 3) and was reported as negative. A repeat lumbar puncture on the twelfth day of hospitalization revealed a decrease in WBCs and CSF protein levels, implying a trend toward recovery (Table 2). Foley's catheter was removed before discharge and his urine output was monitored for the next 48hrs. He did not have any difficulty in voiding after the removal of the foley catheter. He was discharged and advised to review in general medicine outpatient services after 2 weeks. At review, he was completely asymptomatic and without any difficulty in voiding urine.

3. DISCUSSION

"Acute urinary retention is a state of not being able to void urine by oneself. It is caused by bladder outlet obstruction and impaired detrusor muscle contractility. It is common in the elderly but rare in children and adolescents" [8]. "The most common cause of urinary retention in elderly men is benign prostatic hyperplasia" [2]. "Urinary retention in meningitis is a rare entity that is self-limiting" [9].

"The term aseptic meningitis refers to patients who have clinical and laboratory evidence for meningeal inflammation with negative routine bacterial cultures. The most common causes are enteroviruses. Additional etiologies include other infections (mycobacteria, fungi, spirochetes), Para meningeal infections, medications, and malignancies"[10].

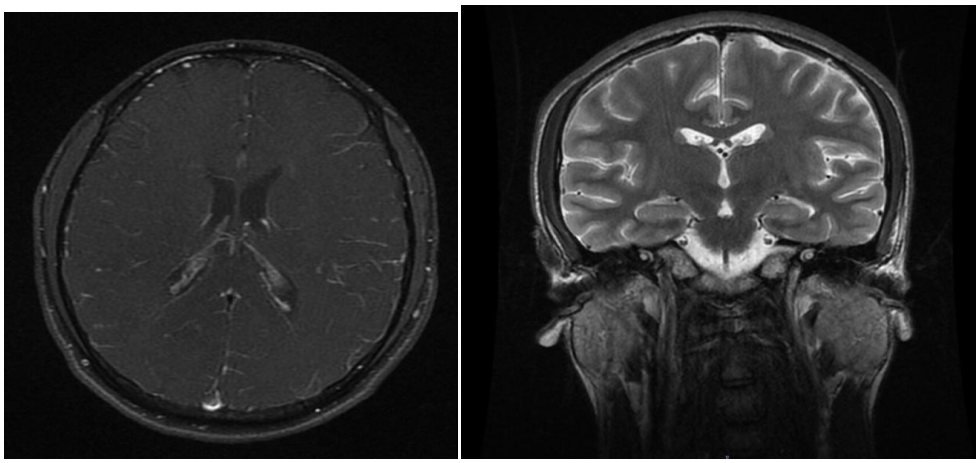

Image 1. MRI Brain with contrast No leptomeningeal enhancement seen

Table 1. A summary of patient's initial blood investigations

Variables	Results
Total leucocyte count (4.0 K/uL- 10.0K/uL)	8.22 K/uL
Neutrophils (60.0% - 80.0 %)	62.7%
Lymphocytes (20.0% - 40.0%)	22.4%
Hemoglobin (13.0 g/dl - 17.0 g/dl)	15.4 g/dl
Platelet count (150.0 K/uL - 400 K/uL)	173 K/uL
C-Reactive protein (0.0 mg/L -1.0mg/L)	0.20 mg/L
ESR (8.0 mm/hr -20.0 mm/hr)	18 mm/hr
Serum creatinine (0.0 - 1.2 mg/dl)	0.83 mg/dl
Serum sodium (136.0 mmol/L - 145 mmol/L)	136 mmol/L

Table 2. A summary of the patient's lumbar puncture results

Variables	HD 2	HD 12
CSF white blood cell (/mm3)	315	80
Differential counts	90% mononuclear and 10% segmented cells	Mononuclear cells
CSF glucose (mg/dL)	38.8	63.7
Serum glucose (mg/dL)	115	126
Protein (g/L)	159.8	52.5
CSF ADA (U/L)	2.5	0.9

Normal values: WBCs<5/mm3; protein, 15.0- 45.0 mg/dl; glucose>2/3 of serum
HD, hospital day; CSF, cerebrospinal fluid: ADA, adenosine deaminase

Table 3. CSF Meningoencephalitis panel

Result Details	Comments
Epstein-Barr virus, Human cytomegalovirus, Varicella-zoster virus, Enterovirus, Human Parvovirus B19, Adenovirus, Herpes simplex Virus 1, Herpes simplex Virus 2, Human herpesvirus 6, Human herpesvirus 7, Parechovirus and Japanese encephalitis virus.	Not detected
Gram-positive bacteria: Staphylococcus spp., Staphylococcus aureus, Enterococcus spp., Streptococcus spp, Streptococcus pneumoniae, Streptococcus agalactiae, Listeria monocytogenes.	Not detected
Gram-negative bacteria: Pseudomonas aeruginosa, Acinetobacter baumannii, Stenotrophomona maltophilia, Escherichia coli, Klebsiella pneumoniae, Serratia marcescens, Enterobacteriaceae, Proteus spp., Morganella morganii, Neisseria meningitides	Not detected
Fungi: Candida spp., C. albicans	Not detected
Resistance markers: mecA, vanA, vanB, blaSHV, blaCTX-M, KPC, SME, NMC-IMI, GES, VIM, GIM, SPM, NDM, SIM, IMP, OXA23, OXA24, OXA48, OXA51, OXA58.	Not detected

Here we report a case of acute urinary retention due to meningitis in a normal healthy individual with no urinary symptoms before the onset of the disease. Even though meningitis is a commonly seen neurological disorder, acute urinary retention with meningitis is a rare presentation.

"Several hypotheses have been put forward to explain the detrusor hypo functioning and urinary retention in MRS, including spinal shock secondary to meningeal irritation, inflammation of tracts of the spinal cord (leading to upper neuron dysfunction), direct viral invasion, or the development of postinfectious acute disseminated encephalomyelitis (ADEM)" [11]. In our patient, however, no lesion could be documented after screening the whole brain. MRI spine screening was planned but was not done due to financial constraints. Empirical treatment and its response were assessed.

Our patient had clinical manifestations similar to those observed in patients with MRS as evident from the literature. [6,9]. "All patients described so far had high fever with meningeal irritation manifesting as headache, stiff neck, and positive Kernig's sign, and then developed urinary retention. The CSF analysis revealed mononuclear leukocytosis, increased protein levels, and decreased glucose content suggestive of aseptic meningitis, hence prompting a diagnosis of MRS" [11].

Abhishek Krishna et al reported [6] similar clinical presentation and viral CSF findings with CSF-PCR HSV- 2 positivity. But in the current case, CSF PCR HCV-2 was negative. However, Inj. Acyclovir was given in both scenarios, and the patients recovered without any intervention.

F. Ntziora et al [12] reported a similar presentation but their patient showed IgM EBV positivity and urinary retention recovered after starting acyclovir without any other intervention. Gen Ishii et al [13], reported a patient in whom CSF herpes simplex (HSV) and herpes zoster viruses (VZV) were both negative but the patient was found to have IgM and IgG HSV titers elevation in the blood. Both patients showed features of MRS and both recovered after starting treatment with acyclovir without any urological complications. In all these reports urodynamic study revealed no abnormalities.

In a study by Akiyuki Hiraga et al [14] on the meningitis-retention syndrome, 37 aseptic meningitis, 3 patients (8%) were found to have MRS. The study also showed that the mean latency between the onset of meningeal symptoms (headache and/or fever) and the three clinical course milestones (the onset of voiding difficulty, urinary retention, and recovery of no residual urine volume) was 8, 9.3 and 18 days, respectively. All patients with MRS recovered without a specific treatment, and the mean hospital stay was 18 days.

MRS is often seen in aseptic meningitis, is self-limiting, and has an average recovery of around 12 days to 18 days.

However, sometimes patients with MRS have only undiagnosed fever and urinary voiding difficulty, with few symptoms of meningeal irritation. Such cases are difficult to diagnose, but the possibility of MRS should be considered.

4. CONCLUSION

In conclusion, MRS may have been underreported or overlooked and may, therefore, be more common than is currently believed. It is important to recognize that adults with MRS have a good long-term prognosis. The awareness of MRS and its clinical course by both neurologists and urologists may help prevent unnecessary investigation and treatment and can reduce patients' anxiety. Further studies are required to resolve the mechanism underlying these syndromes.

CONSENT

Written informed consent was obtained from the patient and the patient bystander for publication of this case report.

ETHICAL APPROVAL

Ethics approval was taken from the Amrita institute of medical sciences and research center.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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