



Urinary Retention a Presenting Symptom of Acute Disseminated Encephalomyelitis: A Case Report

Ruksar S, Jennifer N, Anuragsingh C*, Swapnil K and Varsha C

Department of Pediatrics, MGIMS, India

Abstract

Acute Disseminated Encephalomyelitis (ADEM) is a rare demyelinating disorder of the central nervous system. It is a monophasic disorder characterized by multifocal neurological symptoms and encephalopathy. The autoimmune inflammatory response usually occurs following an infection or vaccination. It is primarily diagnosed by magnetic resonance imaging and cerebrospinal fluid analysis. Differential diagnoses of ADEM includes other demyelinating disorders and multiple sclerosis. Although lower urinary tract dysfunction is a known complication of multiple sclerosis, ADEM may present initially with urinary retention in the absence of other neurological symptoms. We are reporting case of a 9-year-old female child having urinary retention as a presenting complaint and was diagnosed as ADEM.

Keywords: ADEM; Autoimmune disorder; Demyelination; Multifocal; Urinary retention

Introduction

Acute Disseminated Encephalomyelitis (ADEM) is an autoimmune inflammatory demyelinating disorder of the central nervous system. It commonly affects children and is often a monophasic illness with good functional recovery [1]. It is thought to be immune mediated in approximately 75% of cases and follows an antecedent infection or vaccination [2]. Autoimmune antibodies against myelin basic protein, proteolipid protein, and Myelin Oligodendrocyte Glycoprotein (MOG) are thought to be the mechanism for causing ADEM. It predominantly affects 5- to 14-year age group, but may occur at any age. The annual incidence of ADEM is reported as approximately 0.4-0.8 per 100,000 [3]. Although there is no sex predilection for ADEM, males are slightly more affected. It is common in spring and winter seasons. A viral infection precedes onset of symptoms by 1 to 3 weeks. Commonly associated viruses are cytomegalovirus, Epstein Barr virus, herpes simplex virus, influenza virus, hepatitis A, human immunodeficiency virus. Mycoplasma pneumoniae and other bacterial infections including Leptospira, Borrelia burgdorferi and beta-hemolytic streptococci are also associated with ADEM. Vaccination with influenza, polio, hepatitis B, rabies, measles, mumps, rubella, diphtheria, tetanus, pertussis vaccines may cause acute disseminated encephalomyelitis. The clinical presentation may vary from non-specific prodromal symptoms of fever, headache prior to onset of neurological symptoms. Neurological symptoms depend on the area affected by demyelination and may include cranial nerve palsies, diminished vision, seizures, pyramidal tract signs and cerebellar signs. ADEM is primarily a clinical and radiological diagnosis, with no specific confirmatory laboratory tests or pathognomonic imaging findings. Currently, Magnetic Resonance Imaging (MRI) is the imaging modality of choice to demonstrate lesions in the white matter of brain.

Case Presentation

A 9-year-old female child presented with complaints of moderate grade intermittent fever and non-projectile vomiting for 2 days. Child also complained of urinary retention. On examination, she was hemodynamically stable. On central nervous system examination, her GCS was 15/15 (E4V5M6). Cranial nerve examination was normal and had no signs of meningeal irritation. Her muscle tone and deep tendon reflexes were normal. Plantar reflex was normal. Other systemic examinations were normal. On Day 4 of hospitalization, she complained of neck pain and difficulty while walking. On examination, deep tendon reflexes were exaggerated (3+) and Babinski's sign positive. Tone was normal in all the four limbs. Fundus examination was normal. Sensory system examination was normal with intact bladder and bowel sensation.

Laboratory investigations showed hemoglobin of 10 gm/dl, white blood count of 10,000 cells/ μ L,

OPEN ACCESS

*Correspondence:

Anuragsingh Chandel, Department of Pediatrics, MGIMS, Sevagram, Sheela Niwas, P & T Colony, Wardha 442001, India, Tel: 8888473753

Received Date: 11 Oct 2023

Accepted Date: 27 Oct 2023

Published Date: 01 Nov 2023

Citation:

Ruksar S, Jennifer N, Anuragsingh C, Swapnil K, Varsha C. Urinary Retention a Presenting Symptom of Acute Disseminated Encephalomyelitis: A Case Report. *Ann Pediatr Res.* 2023; 7(2): 1077.

Copyright © 2023 Anuragsingh C. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Table 1: Comparison of findings of this case report with previously published studies.

Characteristic	Current case	Doria Lamba	Burla M J	Fukui S
Age	9 y	14 y	16 y	11 y
Gender	Female	Male	Male	Male
Fever	1/1	1/1	0/1	1/1
Urinary retention	1/1	1/1	1/1	1/1
MRI- Brain Hyperintensities	1/1	1/1	1/1	1/1
MRI-spine Hyperintensities	1/1	1/1	1/1	0/1
Corticosteroids	1/1	1/1	1/1	1/1
Immunoglobulin	0/1	0/1	1/1	0/1
Follow up Recovery	1/1	1/1	1/1	1/1

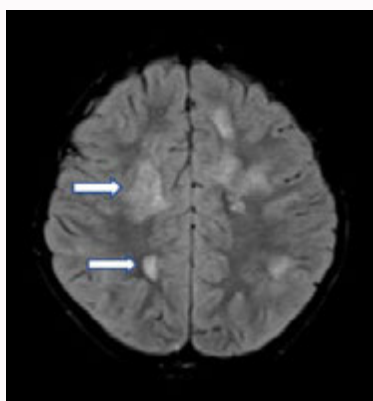


Figure 1: MRI T2/FLAIR image showing hyperintensities in deep white matter of frontoparietal lobes.

platelet count of 350,000/ μ L. Her Serum electrolytes, renal function test and liver function tests were normal. Her C-reactive protein was negative. Her CSF analysis showed glucose =83 mg/dl, protein =77 mg/dl, cells =2-3 lymphocytes/ μ L. Her Magnetic resonance imaging of brain and spine showed hyperintensities in the subcortical white matter of fronto-parietal lobes and spinal segment extending from C2 to D6 level as shown in Figure 1, 2. There were symmetrical hyperintensities in the cervical spine involving H shaped grey matter. Anti-MOG antibody and anti-aquaporin 4 antibody were not evaluated due to non-availability of these tests. She was catheterized for urinary retention.

A diagnosis of ADEM was made due to elevated CSF proteins and hyperintense lesions on MRI brain and spine. Child was given intravenous Methylprednisolone pulse therapy (30 mg/kg) for 5 days and then oral Prednisolone (2 mg/kg/day) for 14 days with gradual tapering. Child showed good response to the therapy and she started showing improvement in her bladder symptoms with improvement in gait. Child was discharged on oral corticosteroid. On regular follow ups, child had no symptoms and neurological examination was normal. An informed written consent was obtained from the parents before writing this case report.

Discussion

ADEM typically presents as a monophasic illness with neurological symptoms following a viral infection or vaccination. The neurological symptoms depend on the site of involvement and progress over a span of 4 to 7 days [4]. Encephalopathy is an essential

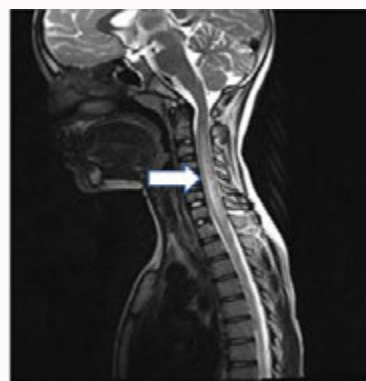


Figure 2: MRI spine showing hyperintensities extending from C2-D6 segment of spine.

symptom for diagnosing ADEM. The symptoms may last for 2 to 4 weeks.

We report a case of 9-year-old female having urinary retention as the only complaint at the time of presentation to us. However, she developed other neurological symptoms and signs on day 4 of hospitalization. Considering her clinical features, progression to multifocal symptoms in the absence of prior history of CNS involvement, ADEM was suspected as the most likely cause. MRI of brain and spine showed hyperintensities on T2 images, which confirmed the diagnosis. There are studies in the literature describing uncommon presentation of ADEM in children, only few studies described urinary retention as presenting complaint of ADEM in children [5-10].

A case report by Doria Lamba et al. describes urinary retention and fever in a 14-year-old male with unremarkable neurologic examination [8]. The MRI showed altered signal intensities on T2 images, like in our case. The child responded well to corticosteroid therapy with resolution of lesions on follow up MRI. Similarly, Burla M et al. reported urinary retention in 16-year-old boy with no other neurologic symptoms and examination abnormalities. The MRI in this case also showed hyperintensities in T2 images [9]. The child received intravenous immunoglobulins and corticosteroids. The child showed recovery on follow up except intermittent catheterization. The present case report also had similar clinical features and the child showed good response to corticosteroid therapy. Table 1 illustrates the overlap of clinical features and management of our patient with previously reported cases.

Fukui et al. from Japan also reported acute urinary retention in a 11-year-old boy having ADEM [10]. He also had fever, headache, and weakness of extremities at the time of presentation. Unlike our case, the MRI spine of the patient was normal except few high signal intensities in cortex on FLAIR images. The child was treated successfully with corticosteroids.

Although previous studies have mentioned urinary complaints in children affected by ADEM, our case report highlights the unusual initial symptom of urinary retention. To our knowledge, it is the only case report from central India describing urinary retention as the initial presenting complaint for ADEM. Previous all case reports had male patients with urinary complaints in ADEM while our case is of a female child. This case report highlights the fact that ADEM can present with only urinary retention as an initial presentation and it should be considered as a differential even in the absence of

typical neurological symptoms. This will help in early diagnosis and timely management with corticosteroids in order to limit the disease progression.

Conclusion

This case report highlights that ADEM may presents with urinary retention in the absence of other neurological symptoms. The complete knowledge of symptomatology of ADEM will help in early diagnosis and timely management, therefore, improving chances of favorable outcome and limit the disease progression.

References

1. Wang CX. Assessment and management of Acute Disseminated Encephalomyelitis (ADEM) in the pediatric patient. *Pediatr Drugs*. 2021;23(3):213-21.
2. Tenenbaum S, Chitnis T, Ness J, Hahn JS; International Pediatric MS Study Group. Acute disseminated encephalomyelitis. *Neurology*. 2007;68(16 Suppl 2):S23-36.
3. Kumar P, Kumar P, Sabharwal RK. Acute disseminated encephalomyelitis: Case report and brief review. *J Family Med Prim Care*. 2014;3(4):443-5.
4. Cole J, Evans E, Mwangi M, Mar S. Acute disseminated encephalomyelitis in children: An updated review based on current diagnostic criteria. *Pediatr Neurol*. 2019;100:26-34.
5. Nasr JT, Andriola MR, Coyle PK. ADEM: Literature review and case report of acute psychosis presentation. *Pediatr Neurol*. 2000;22:8-18.
6. Pradhan S, Mishra VN. A central demyelinating disease with atypical features. *Mult Scler*. 2004;10:308-15.
7. Sacconi S, Salviati L, Merelli E. Acute disseminated encephalomyelitis associated with hepatitis C virus infection. *Arch Neurol*. 2001;58:1679-81.
8. Lamba LD, De Grandis E, De Negri E, Montaldi L, Grosso P, Marazzi MG, et al. Acute urinary retention in a child with acute disseminated encephalomyelitis. *Minerva Pediatr*. 2006;58:305-9.
9. Burla M J, Benjamin J. Pediatric urinary retention in the emergency department: A concerning symptom with etiology outside the bladder. *J Emerg Med*. 2016;50(2):e53-6.
10. Fukui S, Iemura Y, Matsumura Y, Kagebayashi Y, Hotta Y, Yoshida S, et al. Acute urinary retention caused by acute disseminated encephalomyelitis: A case report. *Hinyokika Kyo*. 2018;64(1):17-20.