CASE REPORT

ACUTE DISSEMINATED ENCEPHALOMYELITIS- MYRIADS OF PRESENTATION

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Abstract

This retrospective case series of 6 patients illustrates various clinical presentations of acute disseminated encephalomyelitis (ADEM). The patients presented with acute onset of focal neurological deficit (3 patients), psychosis (1 patient) and ataxia (1 patient) and visual loss (1 patient). Magnetic Resonance Imaging (MRI) of brain showed characteristic radiological changes. Complete recovery was seen in 5 patients, with no evidence of recurrence on follow up. Considering such a myriad presentations, this entity should always be considered in differential diagnosis of acute encephalopathy. MRI should form a part of workup in all cases.

Key words: Acute disseminated encephalomyelitis, methyl prednisolone, MRI.

Introduction

Acute disseminated encephalomyelitis (ADEM) is an acute immune mediated demyelinating disease with a variable clinical presentation. It is a self-remitting disease that follows viral infection or rarely vaccination. No clinical or laboratory feature is pathognomonic and computed tomography (CT) scan of head is not sensitive for diagnosis. MRI brain should be considered early in patients with acute onset of unexplained encephalopathy or focal neurological deficit. It has improved prognosis with immunomodulatory agents like steroids. Patients in our series, diagnosed as ADEM, had variable unusual polysymptomatic presentation and their clinico-radiological profile is presented here, which has been sparingly reported from this part of country.

Case Series

A retrospective analysis of consecutive patients presenting with acute onset fever, altered sensorium with variable neurological deficit, at a tertiary care centre in Northern India, was done over a period of 6 months from January 2009 to June 2009. Detailed examination with investigations [fundus examination, cerebrospinal fluid (CSF) analysis, CT and MRI head] were done. Once a diagnosis of ADEM was made using Krupp Criteria (1), patients were put on methyl prednisolone (25 mg/kg) with supportive management. Patients were followed up monthly over 1 year and follow up MRI was done at 3 and 12 months, post diagnosis.

Six cases (age varying between 4-11 years) were diagnosed as ADEM as per the criteria. Three patients presented with upper motor neuron type quadriparesis with bowel or bladder involvement, 1 with abnormal behavior and unsteady gait each and one with acute onset of visual loss (due optic neuritis with relative afferent papillary defect positive in both eyes and visually evoked potentials showing bilateral delayed p-100 wave). Sensory loss was detected in one patient. One patient had right upper motor neuron type facial palsy (case 2). (See table 1). Work up for tuberculosis and malaria was negative in all cases. CSF examination was normal in 4/6 patients, 1 had raised proteins (case 4) and 1 showed CSF pleocytosis (case 6). CT head was abnormal only in 1 patient only (case

Table 1: Clinical History and MRI Findings

Case No.	Clinical Findings	MRI Picture
1.	Fever, weakness, bladder/ bowel disturbance for 15 days	Patchy ill-defined intramedullary hyperdensities from D2 to D9 level. hyperintense foci on T2 scattered in periventricular sub cortical and deep white matter
2.	Fever, weakness, bladder/ bowel disturbance for 5 days	Multiple T2 hyperintense foci in bilateral supratentorial, sub cortical and deep white matter, bilateral cerebral peduncles, posterior pons, right superior cerebellar and left middle cerebellar peduncles
3.	Abnormal behavior, fever for 7 days	T2 hyperintense foci scattered in bilateral periventricular sub cortical and deep white matter in frontal and parietal lobes
4.	Fever, headache, unsteadiness for 15 days	T2W hyperintense foci in bilateral cerebellar white matter, brainstem, thalami and basal ganglia
5.	Fever, weakness, bladder/ bowel disturbance for 4 days	Two hypointense foci on T1 in Right Corona radiata. On T2, intense central signal. Spinal cord in cervicothoracic region shows thickening +T2 hyperintensity with patchy enhancement.
6.	Fever, sudden visual loss for 7 days	Multiple focal areas of altered signal intensities (hyperintense) on T2/ FLAIR images in bilateral subcortical white matter, basal ganglia and right thalamus.

1 had bilateral white matter edema) while MRI brain showed changes of ADEM in all (see table 1). Two patients had spinal cord involvement (case 1, 5). Five patients had complete recovery both neurologically and developmentally, while one with severe neurological deficit had partial recovery only (case 2).

Discussion

ADEM is a monophasic, polysymptomatic immune-mediated demyelinating disorder. (2) The mean age at presentation is 6-8 years. (2-4) Typical cases of ADEM arise 1-20 days after a febrile infectious illness (commonly following respiratory or gastrointestinal) presumed to be of viral etiology, including rubeola, rubella, varicella, herpes etc. (2,5) It may follow immunizations which include rabies, pertussis, measles, Japanese B virus, tetanus, and influenza. (5) Hepatitis B vaccine as a possible cause has been recently refuted. (6) Only one-third of our patients had preceding illness of upper respiratory tract or diarrhea while none received vaccine in recent past.

The first signs of ADEM usually include abrupt onset of irritability and lethargy. It has varied presentations, as evident by our study, ranging from involvement of cerebrum (seizures, psychiatric features, hemiparesis) and brainstem (cranial nerve involvement) to spinal cord (paraparesis). (2-4) Presentation with altered behavior (in form of psychosis), as in one of our cases, is extremely rare. It may have typical cerebellar/ meningeal signs and optic neuritis (though only 1/6 had optic neuritis in our study). (7) Relapsing/ multiphasic ADEM (MDEM) has been described in some studies. (2) ADEM is now being diagnosed more frequently with the broader use of MRI which typically shows T2 enhancing disseminated multifocal lesions in the white matter, basal ganglia, thalamus, and brainstem consistent with edema, inflammation, and demyelination. (2,4,6) Sometimes initial MRI may be normal and then later characteristic lesions appear. Thus, appearance of new lesions during recovery may not represent recrudescence. CSF findings are non-diagnostic, with majority having mild pleocytosis and normal to raised proteins. (5) Only two of our patients had abnormal CSF findings. The CT scan shows low-density abnormalities in white matter, but frequently may be normal as in our series. The differential diagnosis should include encephalitis, multiple sclerosis (MS), progressive multifocal leukoencephalopathy, cerebrovascular accident, acute inflammatory demyelinating poly-radiculoneuropathy and cranial thrombotic lesions. The biggest challenge is to differentiate with the 1st episode of MS. Features favoring diagnosis of MS include later age at presentation (second decade), focal signs without significant encephalopathy, periventricular and corpus callosum lesions on MRI, appearance of new MRI lesions after resolution of initial episode. The IgG (intrathecal) index, IgG synthetic rate, or oligoclonal bands are positive in majority of first MS episodes and in >90% cases with recurrent attacks. (2,7,8) These studies are positive in <30% of ADEM cases. (2,3,7) CSF cytokines analysis is an upcoming modality for this differentiation. (9)

The outlook for recovery is generally excellent. More than 50% of children recover without disability within 6 months (2,7), the remainder may have residual disability. Mortality is <5% (10,11). Prognosis for complete recovery is poor in children younger than 2 years, polysymptomatic presentation, progressive evolution, patients with myelitis, and those who have significant edema of the brain or spinal cord. (2) Most of our patients (5/6) had complete recovery. Supportive care forms the cornerstone of therapy with immunomodulatory pharmacotherapy rapidly being recognized as an important adjuvant. These may include high-dose intravenous corticosteroids (methylprednisolone) and intravenous immunoglobulin (IVIG). Alternative approaches include (1) combination of intravenous corticosteroids and IVIG, (2) cyclosporin, (3) cyclophosphamide, or (4) plasma exchange/ plasmapheresis. (10,12,13)

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