CASE REPORT

Measles with Acute Disseminated Encephalomyelitis (ADEM)

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Manuscript received: June 25, 2007; Initial review completed: December 10, 2007; Revision accepted: March 18, 2008.

We report a seven year old male with measles associated acute disseminated encephalomyelitis (ADEM) despite having received measles vaccination in infancy. The diagnosis was based on serum antimeasles antibodies and MRI brain. The patient was managed with high dose corticosteroids along with supportive measures. There was a complete neurologically and physica recovery.

Keywords: *Demyelination, Inflammatory encephalomyelitis, Measles, Post infectious encephalomyelitis.*

Acute disseminated encephalomyelitis is an inflammtory demyelinating illness distinguished by monophasic course frequently associated with infections (post infectious) or antecedent immunization (post vaccination)(1, 2). Due to control of most vaccine-preventable diseases, most cases of ADEM occur in developing countries and are seen secondary to non-specific upper respiratory tract infections(3). We present a case of measles associated ADEM despite the child having received single-dose measles vaccine during infancy.

CASE REPORT

A 7 year old male was brought with complaints of fever for 4 days and generalized rash, bodyache and drowsiness on day 5 of illness. The child had received all the vaccines from our hospital including the single-dose of measles vaccine at the age of 9 months. On examination, the patient was febrile with non-pruritic erythmatous maculopapular rash with 'Kopliks' spots, no lymph nodes, mild pallor, and no icterus. The Glasgow coma scale was 12/15. There were no signs of meningeal irritation. Fundoscopy, cranial nerves and higher functions were normal. There was hypertonia, hyperreflexia, and right upper motor neuron hemiperesis. Other systems were normal. The child progressively deteriorated in the first 2 days, was comatosed (GCS 5/15) and remained in this condition for 4 days, he also had convulsion and decerebrate rigidity. Routine hematological and biochemical investigations including renal and liver function tests were normal.

Arterial blood gas analysis, stool examination for pH and reducing substances, urine for reducing sugars and ketone bodies were normal. Electrolytes, X-ray skull, bones and chest, USG abdomen were also normal. CSF was grossly clear with 11-15 WBC/dL of which 80% were lymphocytes with normal protein and sugar values. CSF sent for bacterial culture was sterile. IgM antibodies for measles were positive in blood (156mg/dL), however, CSF antigen or antibodies could not be measured. EEG findings were non specific. MRI revealed hyperintense signals on T_2 weighted sequence over bilateral subcortical areas and cerebral cortices with involvement of midbrain, cerebellar puduncles, thalamus and basal ganglion, suggestive of ADEM (***Fig* 1**).

Patient was isolated and treated on routine protocol for measles and intravenous methyl-

prednisolone 30mg/kg/day was given for 3 days. Subsequently, intravenous dexamethasone was administered for next 10 days followed by oral prednisolone for another 7 days. The child remained aphasic for first twenty five days but recovered slowly over next six months. Six months later the child recovered completely neurologically and physically, the repeat MRI scan was also normal.

DISCUSSION

Clinical features including fever, rash, koplik spots, drowsiness, rapid neurological deterioration, presence of serum IgM antimeasles antibodies, MRI findings and subsequent improvement with high dose corticosteriods led us to the diagnosis of measles associated ADEM. However, it is difficult to differentiate it from SSPE presenting as ADEM but presence of myoclonic convulsions, typical EEG findings, latent period and no improvement with steroids and raised CSF/serum measles antibody titers can differentiate it from SSPE(4). There was no partial or complete paraplegia or quadriplegia, diminished or loss of reflexes as occurs in myelitic form of ADEM(5).

Post infectious encephalomyelitis is associated with concomitant or antecedent infection, usually viral. Most notoriously, measles virus infection is followed by ADEM in approximately 1 in 1000 unvaccinated children and tends to produce more serious phenotype(6). Bilateral optic neuritis, ataxia, transverse myelitis, cranial nerve involvement and rarity of seizures are suggestive of ADEM(7), is contrary to our case who had a florid, monophasic and polysymtomatic presentation despite already vaccinated and did not have any residual effect in spite of such explosive illness.

Because of contagiousness of measles, even sustained high coverage with single-dose strategy does not prevent large out breaks of measles with significant morbidity and mortality. So a second opportunity for measles immunization is essential for effective measles control, as is done in England and Wales, Albania, Romania, Oman, Shondong and Heman provinces of China and USA(8), our case report also favours that a single-dose vaccination is not sufficient for good control of measles and its neurological complications.

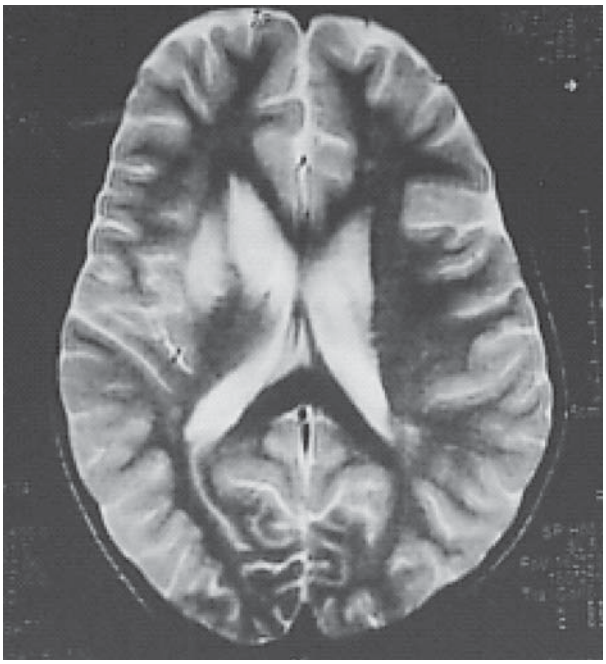

FIG 1. MRI Brain showing FLAIR sequence hyperintensities of cortical and subcortical structures.

Contributors: Manuscript and the report was designed and prepared by SMA, revised by KK, and supervised and guided by JC.

Funding: None.

Contributors credits: None stated.

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