Pediatric Research and Child Health

CASE REPORT

A Case Report of a Toddler with Hand-Foot-Mouth Disease with MRI Characteristics of Brain Stem Encephalitis Caused by Enterovirus 71

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Abstract

Background: Hand, foot, and mouth disease (HFMD) is a highly contagious viral infection occurring mostly in infants and children.it's coused by viruses from the Enterovirus genus,most commomly the coxsackie virus. These viruses can spread from person-to-person through direct contact with unwashed hands or surface contaminated with feces.Infection mostly occurs in children < 5 years of age. Severe cases, however, are usually encountered in children under the age of 2-3 years.

Introduction: We report a rare case of HFMD in a toddler male residing in kolhapur, (Maharashtra) india. The clinical presentation was typical of HFMD and included vesicular lesions and oral mucosal ulcers, macular and vesicular lesions on palms and soles with neurological involvement. The patient showed neurological improvement and recovered completely in 2 weeks

Conclusions: This case indicates that Enterovirus infection may cause HFMD in toddler with potentional neurological involvement. pediatricians should be aware of the possibility of HFMD occurring in toddler and prompt treatment should be given under neurophysician could be life-saving in these patients.

Background

Hand, foot, and mouth disease (HFMD) is a highly contagious viral infection occurring mostly in infants and children.it's coused by viruses from the Enterovirus genus,most commomly the coxsackie virus. These viruses can spread from person-to-person through direct contact with unwashed hands or surface contaminated with feces.Infection mostly occurs in children < 5 years of age. Severe cases, however, are usually encountered in children under the age of 2-3 years.

Case presentation

A toddler male child was admitted in Masai Children's Hospital, kolhapur, Maharashtra, India., on November 11, 2019 with a history skin rash over hand and feet and oral mucosal ulcerations since 8 days, fever since 3days and jerking of exteremities mainly in sleep since 2 days. Wakes up after the jerks, and non-projectile vomiting 1 days prior to admission. Two days prior to admission, the patient developed drowsiness, startle, hand tremor, urinary incontinence, and mild progressive deterioration in consciousness. Medications were limited to recent use of analgesics. The patient's body temperature was 36.8 °C, respiratory rate was 32/min, pulse rate 112 beats/min, and blood pressure was 90/62 mmHg. Vesicular lesions and ulcers were present in the oral mucosa, and macular and vesicular lesions were present on palms and soles (Figure 1).

The patient was drowsy, but was responding to painful stimuli. The pupils were equal in size (diameter: 3 mm) and the pupillary light reflex was bilaterally symmetrical and fluggish. Neck resistance was normal. The muscle strength in right and left limbs was normal. Abdominal reflex and cremasteric reflex were normal. Pathological reflexes (e.g.,Babinski, Chaddock, Oppenheim, Gordon) were negative. The rest of the physical findings were unremarkable. Results of blood test were as follows: White blood cell count, 19900; neutrophils, 60% and blood glucose, 70 mg/L. Findings of cerebrospinal fluid (CSF) examination were as follows: Total number nucleated cells ,50/cmm, lymphocytes 95%, neutrophils 05%%; protein, 38.40 mg/L; glucose, 74.10 mg/L. All tests were performed in the clinical laboratory at Jeevan pathology lab, Kolhapur, Maharashtra, India. The patient showed progressive loss of consciousness and jerking of extrimites mainly during sleep and wakes up after jerks. Thus transferred to the paediatric intensive care unit (PICU). The patient showed response to painful stimuli, and thus the muscle strength was not detected. The status of abdominal, cremasteric, and pathological

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Figure 1: Indicating skin rash over hand, feet and oral mucosal ulcerations.

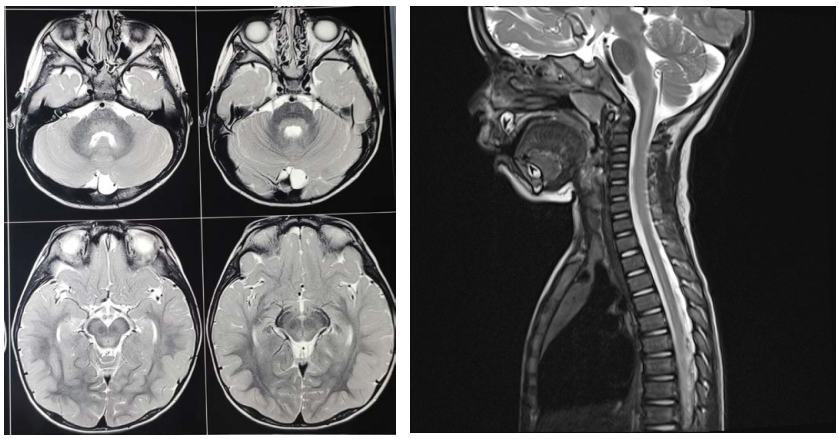

Figure 2: T2 hyper intensities seen in tegmentum of pons and dorsal part of medulla with downward extension through entire spinal cord.

reflexes was identical to that at the time of hospital admission. Based on the above clinical symptoms, a diagnosis of HFMD with brain stem encephalitis was established by specialists in the Department of Neurology. The patient was administered mannitol (5 mL/kg/dose,q4h) to reduce the intracranial pressure, Acyclovir as antiviral therapy. The patient was also administered sodium valprote (15 mg) twice daily for 4 days and by tappring dose for next 2 days.

The child video EEG was recorded while child was asleep on day of admission. The results were indicative of focal epileptiform activity over right fronto-central region with secondary generalization. On day 2, Head MRI performed noticed subtle diffuse symmetrical altered signal intensity involving the dorsal aspect of pons and mid brain (Figure 2) with extension into the medulla with douteful extension of the signal abnormaliy into the entire length of the spinal cord.

Patient showed progressive improvement and decreased jerky movements. Thus he was discharged from the hospital on day 10 following admission. Two weeks after discharge, the patient showed full recovery.

Discussion

HFMD is an acute infectious disease caused by a group of enteroviruses, among which EV71 and CVA are the most common pathogens [1]. The symptoms are generally mild and self-limiting.

The main clinical manifestations are fever, rash, and ulcers in oral mucosa, over hands, feet, and buttocks. A small proportion of paediatric patients are known to develop severe complications such as meningitis, encephalitis, encephalomyelitis, neurogenic pulmonary edema, and circulatory failure [2] .Since the first report in the year 1958, HFMD outbreaks have been reported in East and Southeast Asia [3-8]. HFMD caused by EV71 may be associated with severe, potentially life-threatening complications in children, such as brainstem encephalitis, aseptic meningitis, encephalitis, flaccid paralysis,heart failure, and lung failure [9]. Approximately 10–30% of the hospitalized patients during EV71-associated HFMD epidemics in Asia reportedly developed a spectrum of neurological complications [2, 7]. HFMD has been reported from many Indian states such as West Bengal, Kerala, hills of northern India, [19] Odisha, [20] Maharashtra, and Karnataka. [17] There are reports even from Andaman Islands[18]. Moreover, EV71 infection also caused three deaths among HFMD children in Singapore in the year 2001[10].The patient in the present study had typical clinical features of mild to moderate HFMD. The patient showed jerking of exteremities mainly in sleep since 2 days. Wakes up after the jerks, and non-projectile vomiting 1 days prior to admission bilateral pupil symmetry, shallow breathing, and sluggish pupillary light reflex. The diagnosis of brainstem encephalitis was established based on the above clinical symptoms by neurologist.

Moreover, detection of EV71 in stool samples by RT-PCR is widely used in clinical settings to monitor the development of HFMD [11]. In addition, ELISA for anti-EV71 IgM levels in CSF and blood samples are also used to confirm the viral infection [11,12]. HFMD occurs mostly in children under the age of 5years [3, 13].Thus due to affordable issues RT-PCR and ELISA for anti-EV71 was not done. However, adult cases of HFMD caused by CVA16 virus have been reported at the

age of 21, 35,and 37 years Severe and critically-ill patients with HFMD caused by EV71 are mostly under the age of 3 years, and are rarely seen in children above the age of 14 years [14]. The patient in this report was 1.5 years and exhibited mild to moderate symptoms of HFMD. In the present report, the patient was diagnosed with HFMD on the fourth day of onset in opd , and developed neurological manifestations on the 8 day of onset, which is consistent with the progression of HFMD in children in the age-group of 1–3 years.

World Health Organization as well as HFMD epidemic countries have developed guidelines for the diagnosis and treatment of HFMD, including the staging and classification of HFMD. Different treatments are employed for respective phases of HFMD [15, 16]

Conclusion

This case illustrates that EV71 infection may cause HFMD accompanied by sever neurological manifestations in infants and children. The course of the disease and the associated complications also. Clinicians should be aware of the possibility of HFMD occurring in infants and children, and prompt treatment could be valuable in reducing complications and saving lives.

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