ORIGINAL ARTICLE

HAND, FOOT AND MOUTH DISEASE IN DEHRADUN CITY

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ABSTRACT: INTRODUCTION: Hand, foot and mouth disease (HFMD) is a viral infection of children caused by Coxsackie virus- A16, a type of enterovirus seen worldwide, but uncommon in India. It is sporadically reported from India as a mild illness. **OBJECTIVE:** To describe the clinical features of cases in an outbreak of Hand, Foot and Mouth Disease (HFMD) in Dehradun, the capital city of state Uttaranchal. **RESULTS:** A total of thirty eight cases of HFMD occurred in the city over a period of six weeks between September 14 and October 19, 2013. Fever and rash were the most common presenting symptoms, with the rash distributed mostly over oral mucosa (94.7%) and distal extremities involving hands and feet (76.3%) followed by the buttocks (63%) and knees (39.4%). All the cases were diagnosed clinically without laboratory confirmation. Lesions healed in about 7 days in majority of the patients. All cases resolved without complications. **CONCLUSION:** The characteristic clinical features described will be useful for early clinical diagnosis where laboratory confirmation is not feasible.
KEYWORDS: Epidemic, Hand foot and mouth disease, India, Children.

INTRODUCTION: Hand, foot and mouth disease (HFMD) is caused by human enteroviruses. Coxsackie virus A16 (CAV16) and enterovirus 71 (HEV71) are two major causative agents. It affects predominantly children aged under 10 years old, but can also occur in adults.[1, 2] The infection usually occurs by fecal- oral route, leading to viremia and invasion of the skin and mucosa. The incubation period is 3-7 days followed in some cases by a brief prodrome of mild fever and malaise.

The clinical illness presents usually with enanthems. Thin walled vesicles appear on hard palate, tongue, lips and buccal mucosa, which may ulcerate, resembling aphthous ulcers. Rarely oral lesions may be the only manifestation of HFMD but usually skin lesions are also present. Clusters of maculopapular, vesicular and /or pustular lesions may occur on the hands and fingers, feet, buttocks and groin. Vesicles may rapidly ulcerate producing multiple small superficial ulcers with erythematous halos.

The lesions on hands and feet usually occur on dorsal surfaces but frequently also occur on palms and soles. The vesicles usually fade in about one week. Diagnosis of HFMD is usually based on the clinical picture alone.[1-6] Differences in the course of HFMD have been observed, depending on the virus type.[2] Infection with EV71 is of particular concern as it can cause severe disease in children, with high rates of neurological and cardiopulmonary involvement including brainstem encephalomyelitis, neurogenic pulmonary edema, pulmonary hemorrhage, shock and rapid death.[1,7]

Many deaths have been reported due to severe outbreaks of HFMD from many Asian countries.[2-5] In spite of repeated epidemic in many countries of the Asia-Pacific regions since

1997, this disease did not affect India till 2003, when the first ever epidemic was observed in Kerala in 2003.[2] The others were reported from Nagpur in 2005-06,[3] West Bengal in 2007[4] and from state of Odisha in 2009.[5,6] Here we report a recent outbreak of HFMD in children in Dehradun city of Uttaranchal state in Northern India.

METHODS: On finding the first case in dermatology outpatient clinic at Medical College, Dehradun, on 14.9.2013, pediatricians and dermatologists serving in the hospital were requested to refer all the children brought with papulovesicular lesions to the outpatient clinic of Dermatology department for clinical evaluation. Detailed history and clinical examination findings of the suspected patients were recorded in a structured format.

A total of 38 cases of HFMD were reported till 19.10.13.The clinical presentation and demography of the affected population in this outbreak are described in tables 1-3. All the parents of children with suspected HFMD were educated to watch out for warning signs like vomiting, lethargy, irritability, and difficulty in breathing, difficulty in walking or seizures.

Laboratory evaluation for the suspected viral etiology was carried out on a subset of six serum samples. The samples were tested at national Institute of Virology, Pune by molecular diagnostics. Skin biopsy and histopathology from clinical samples was done in none of these cases.

RESULTS: The first case of HFMD was found on 14.09.13, in Dehradun, the capital city of state Uttaranchal, in a 14 year-old male child, who presented with multiple papulo-vesicular lesions over the hands, feet, oral mucosa, buttocks and knees along with mild fever, cough and sore throat of three days duration. Of the 38 patients seen with clinical HFMD during study period of five weeks duration, there were 20 males and 18 females (table 1). Their age group ranged from 9 months to 16 years (mean age 4.4 years). 29 were preschool or early school going children (table 1). Mean duration of symptoms was 3 days.

Majority of the patients had enanthem involving oral cavity and papulovesicular lesions involving extremities, buttocks and knees (Figures.I-3) as presenting signs. Oral mucosa (94.7%) and distal extremities lesions involving hands and feet (76.3%) were the most commonly affected sites, followed by the buttocks (63%) and knees (39.4 %). Oral lesions began as small erythematous macules that evolve into 2 to 3mm vesicles on an erythematous base and involved tongue, inner aspect of the cheeks and lips, gums and the hard palate.

On hands and feet, the disease started as small erythematous maculopapular rash that rapidly progressed to papulovesicular lesions with an erythematous halo. Lesions were localized more to palmar and plantar surface as compared to dorsal surface of hands and feet. The number of lesions ranged from few to numerous.

About half of the patients had systemic symptoms at the start of the illness. Fever (52.6%) was the most common systemic symptom followed by cough (44.7%); sore throat (39.4%) and anorexia (31.5%) etc. 26% (10/38) children had history of similar lesions either in the other siblings of the family or in the neighborhood.

No systemic complications were observed in these children. All the cases improved spontaneously with symptomatic treatment with topical antibiotics, oral antihistamines and

antipyretics, without any requirement for hospitalization. Of the 38 total children, 20 could be followed up completely who showed an average healing time for skin lesions as 6-10 days (mean 7.2 days) without residual scarring. All the six serum samples sent for testing to National Institute of Virology, Pune for molecular diagnostics were negative for enteroviruses PCR.

DISCUSSION: In developing countries like India, the diagnosis of HFMD is often made on clinical grounds alone, as virological studies are not easily available. [4,7] Herpangina, a viral infection of children, is also caused by type A coxsackie virus which presents with similar types of oral ulcers but are more extensive involving the tonsils, pharyngeal mucosa, soft palate and posterior part of buccal mucosa. Unlike HFMD, there are no skin lesions in herpangina. [3, 7, 8]

Diagnosis of HFMD in this first ever reported outbreak from Northern India was based on the typical presentation of oral ulcers and lesions on the hands and feet. Majority of our patients had lesions involving oral cavity (94.7%). While previous studies done on HFMD documented oral lesions in 44 to 86% cases. [2, 4, 6, 9] Severity of the disease was the highest over palms and soles in our study.

Similar observations were made by Sasidharan et al in 2003 Calicut outbreak, [2] while it was highest in severity over the buttocks and knees in West Bengal and Odisha outbreaks. [4, 6] A history of systemic symptoms was found in almost half of the patients as compared to 75% in 2009. [6] The most common systemic symptoms in this outbreak were fever cough and sore throat. The main aim of primary care doctors observing cases of HFMD is to identify cases that are likely to develop a severe form of the disease.

Assessment should begin with a good history and physical examination, paying particular attention to eliciting the warning signs indicative of CNS involvement like fever ≥ 39°C or ≥ 48 hours, vomiting, lethargy, agitation/irritability, myoclonic jerks, limb weakness, truncal ataxia, "Wandering eyes", dyspnea/ tachypnea or mottled skin. If one or more of the warning signs is present, the clinician must carefully assess the neurological and hemodynamic status of the patient in order to provide timely intervention before the onset of fulminant, intractable cardiopulmonary failure.[7]

During the last two decades, there was a sharp rise in incidence, severity, complications and fatalities in the Southeast Asian countries.[6,7] Fatal outbreak occurred in Malaysia (Sarawak) in 1997,[10] Taiwan in 1998[11] and Singapore in 2000.[12] The Chinese outbreak of 2008 has already caused 353 deaths.[7,13]

The first report of disease outbreak in India came in 2004 from Calicut. Sasidharan et al reported 81 cases in an outbreak from Calicut, between October 2003 and February 2004. [2] This was a mild illness without any complication or mortality. After 3 years, the first large scale outbreak occurred in 2007 from West Bengal [4] and later from Odisha in 2009[5, 6]

Since then, many small scale outbreaks have been repeatedly reported from different places. [3, 14-16] The outbreaks of disease have increasingly being reported from almost all parts of India, this time from a northern state. Although of milder degree, it may indicate vulnerability of India from possible future fatal outbreaks.

Laboratory diagnosis is usually performed by virus isolation of cell culture from throat/ vesicle swab and stool specimens. It is mostly necessary for research purpose, strain analysis or

occasionally in cases with atypical manifestations. CAV16 and CAV6 are major and CAV10, EV-71 and E-9 are rare viral pathogens of HFMD circulating in India.[13] Neurological involvement is frequently noted in HFMD associated with HEV71 but this is very unusual in CAV16 associated cases.

Outbreak of HFMD in Calicut, identified association with antibodies against HEV71 (2); while it was due to CAV16 from Nagpur[3] as well as from Odisha outbreak in 2009.[7] We could not confirm the diagnosis of HFMD in this outbreak from six serum samples sent for enterovirus PCR. Effective and accurate virological diagnosis depends on the correct timing and collection of appropriate clinical specimens, and their transport to the laboratory under optimal conditions.

There is neither an effective antiviral therapy nor an effective vaccine available against the disease. Early detection of outbreaks, early recognition and intervention in cases at high risk of developing the rare but severe forms of the disease are therefore among the key principles applied to minimize the impact of the disease. [7] Prevention of further spread of the disease is by avoiding direct contact with affected people and monitoring cleanliness of the hands, utensils and drinking water.

CONCLUSIONS: The present report is expected to increase the awareness amongst the practitioners regarding the clinical presentation, warning signs; and benign and self-limiting nature of HFMD.

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Age	No. of cases		Total (%)
	Males	Females	
<12 months	1	1	5.26
1-5 years	15	14	76.31
5-15 years	3	3	15.78
>15 years	1	0	2.63
	20	18	38(100)

TABLE 1: Age and sex distribution of HFMD patients

Symptom	No. of patients	% age
Fever	20	52.6
Cough	17	44.7
Sore throat	15	39.4
Anorexia	12	31.5
Malaise	4	10.5
Abdominal pain	4	10.5
Diarrhea	3	7.8
Constipation	1	2.6

TABLE 2: Systemic symptoms observed in HFMD patients

Site of lesion	No. of patients	% age
Palms and soles	29	76.3
Tongue	27	71
Dorsum of hands and feet	24	63
Buttocks	24	63
Inside of cheeks and lips	22	57.8
Knees	15	39.4
Gingiva	10	26.3
Elbows	8	21
Palate	6	15.7

TABLE 3: Distribution of lesions in HFMD patients

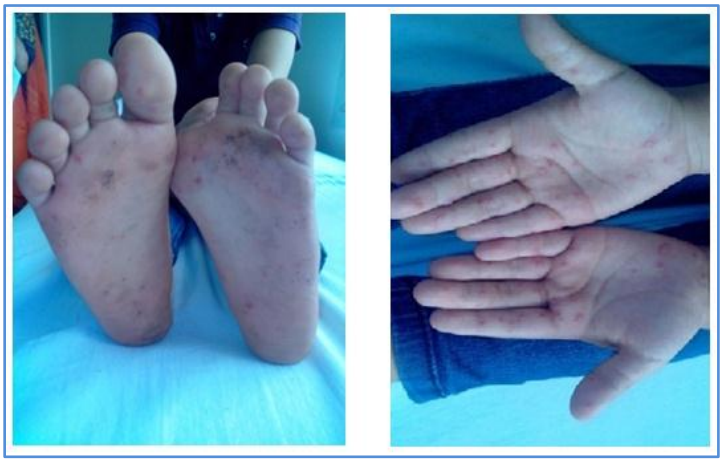

Figure 1 Figure 2

(Papulovesicular lesions over palms and soles of hands and feet in a child with hand, foot and mouth disease).

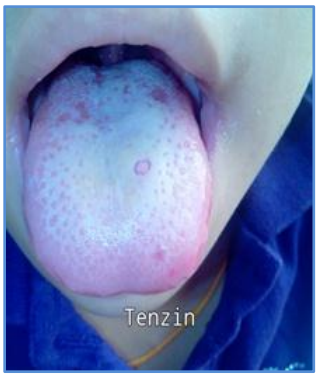

Figure 3

(Lesions of hand, foot and mouth disease over tongue and buccal mucosa)

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