

Clinico-epidemiological study of hand foot & mouth disease

T. Vani, S. Nageswaramma, Srinivasa Rao Mudavath, D. Rakesh Ranen, B. Srujan Kumar, G. Prem Sagar

Affiliation: : Department of D.V.L. GGH, Guntur, Andhra Pradesh.

Date of Submission : 30-10-2018 **Date of online Publication** : 27-01-2019
Date of Acceptance : 01-12-2019 **Date of Print Publication** : 31-03-2019

***Author for correspondence:** Dr.T.Vani, Flat No.504, Yaganti Gold, 10/2 Arundelpet, Guntur, AndhraPradesh, Pin: 522022. E-mail: vanisomayajula@yahoo.co.in

ABSTRACT

Background: Hand foot mouth disease (HFMD) is a self-limiting viral disease which is mainly caused by Coxsackie virus A16 & Enterovirus 71 with a distinct clinical presentation of oral lesions and characteristic papulovesicular eruptions on distal extremities, mainly affecting the infants and children. **Aim:** To study the clinico-epidemiological features of HFMD during an outbreak in Guntur. **Methods:** A prospective observational study was conducted during the period October 2017 – April 2018. The study included consecutive cases of clinically diagnosed HFMD in children attended to DVL OPD, Guntur General Hospital. **Results:** Seventy cases of HFMD were detected from October 2017 to April 2018. Age ranged from seven months to 13 years. Prodromal symptoms of varying intensity were present in all the cases. All patients recovered without any complications. **Conclusion:** HFMD though occurring as isolated events, rise of epidemics across the globe and India is definitely alarming.

Key Words: Hand Foot Mouth Disease, Andhra Pradesh, Epidemic.

INTRODUCTION

Hand, foot, and mouth disease (HFMD) is a viral infection caused by enteroviruses predominantly affecting children. CA16 and EV71 were reported as the major enterovirus types where as A4, A5, A8, A10, B3 and B7 act as the minor etiological agents causing HFMD.¹ It is highly contagious and is clinically characterized by prodromal fever followed by a combination of exanthems and enanthems. The present study was conducted in a tertiary hospital at Guntur district on the clinical presentation and demography of the affected population with HFMD during the period October 2017 to April 2018. The details were described herein.

Objectives: To study the clinical features and demographic patterns of HFMD occurred during an outbreak in Guntur.

MATERIAL AND METHODS

A prospective observational study was conducted from October 2017 to April 2018 in a tertiary hospital at Guntur, Andhra Pradesh. The patients studied were children brought with papulovesicular exanthems, enanthems to the outpatient department, D.V.L. The history and clinical examination findings of the patients were recorded. Routine hematological workup was done.

Inclusion Criteria:

All patients diagnosed as HFMD on clinical basis. Age < 18 years.

RESULTS

During the period between October 2017 and April 2018, a total of 70 patients who were clinically diagnosed as HFMD were observed. Among them 92% of cases occurred during the months of October and February. **(Table 1)** Age group varied from seven months to 13 years. 96% of HFMD cases were younger than five years, of which 24% were infants. Only four percent of cases were aged above five years. **(Table 2)** Boys were 57% and girls were 43%. All patients presented after one to three days of onset of the disease and were associated with prodromal symptoms of varying intensity (fever, malaise, running nose, irritability). Irritability was observed more in younger children. Extent of skin and oral involvement was proportionate to the prodromal symptoms.

Both skin and oral lesions were present in 80% of cases. **(Table 3)** Papulovesicular lesions on erythematous background were distributed over hands, feet, buttocks, thighs, legs, knees, forearms and elbows (Figure 1,2,3,4,5). Lesions of varying number were present on the trunk in 14% of patients (Figure 6). Oral lesions in the form of aphthous like ulcers were present in 80% and perioral area in 50% of patients. Patients with oral lesions had presented with drooling saliva and refusal of feeds. History of contact with similar cases either in the family or neighbours was found in 80% of cases. All the patients were treated symptomatically. Children with

high fever and extensive lesions with feeding difficulties were given Acyclovir in divided doses. Significant response is noted in these cases. Recurrence was noted in four patients in three months. None of the children had systemic complications.

Table 1. Number of HFMD cases month wise

Month, Year	Number of cases
October, 2017	20
November, 2017	16
December, 2017	14
January, 2018	10
February, 2018	5
March, 2018	2
April, 2018	3

Table 2: Age distribution of the cases

Age	Number of cases (%)
<1 year	16 (24%)
>1 year to 5 years	51 (72%)
>5 years	3 (4%)

Table 3: Presenting Symptoms & Signs of HFMD

Symptoms and signs	Number of cases	Percentage
Prodromal symptoms		
Fever	70	100%
Running Nose	39	56%
Irritability	40	57%
Malaise	40	57%
Papulovesicular lesions		
Oral ulcers	56	80%
Perioral	35	50%
Palms	70	100%
Hands	70	100%
Elbows	70	100%
Trunk	10	14%
Buttocks	70	100%
Thighs	70	100%
Knee	70	100%
Feet	70	100%
Soles	70	100%

DISCUSSION

HFMD first diagnosed in child suffering from fever with rash in Toronto in 1957.² Reports from Asia- Pacific region indicated occurrence of epidemics in 1997 (Sarawak)³, 1998 (Taiwan)⁴, 1999 (Perth)⁵, and 2000 (Singapore, Korea, Malaysia, & Taiwan)⁶.

The first epidemic in India was reported from Kerala in 2003.⁷ Subsequently several states of India had reported epidemics. (Table 4) Maximum number of the cases occurred during summer and early autumn.¹⁴ Seasonal similarity noted in the present study. In most instances,

this is a mild self-limiting illness. The skin lesions heal spontaneously without scarring.

Table 4: Epidemiological data of HFMD epidemics in India

State	Year	Number of reported cases
Kerala – Calicut ⁷	2003-2004	81
West Bengal – Multi-centric study ⁸	2007	38
Assam – Jorhat ⁹	2008	34
Orissa ¹⁰	2009	78
West Bengal – Kolkata ¹¹	2010	62
Rajasthan – Udaipur ¹²	2012	38
Telangana ¹³	2016	50



Figure 1: lesions on perioral area



Figure 2: oral lesions



Figure 3: lesions over buttocks, thighs, legs & over trunk



Figure 4 : lesions over both hands

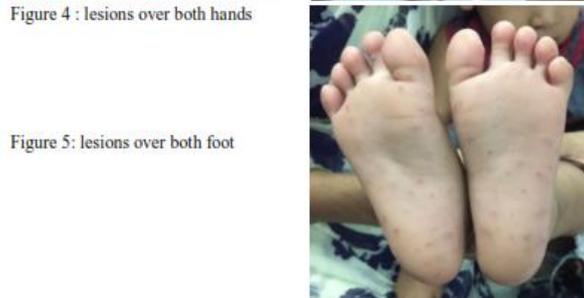


Figure 5: lesions over both foot

It is possible that the emergence of HFMD in India may be related to the mass polio vaccination. At any given time only one type of enteric virus multiplies within the intestine. Polio vaccination has eliminated polioviruses from the gut, thereby increasing the chances of coxsackie and enteric viral infections.

Hand foot and mouth disease (HFMD) is a self-limiting viral disease affecting predominantly children and immunocompromised adults. It is caused by serotypes of picornaviridae family of genus enteroviruses, most frequently CA16 and EV71.¹ They have single positive strand genomic RNA with high mutation rate. Due to the presence of multiple genotypes and subgenotypes repeated epidemics of HFMD have occurred and others are expected in future. An outbreak is usually followed by a quiescent phase of few years. Like all other enteroviruses, children are the most significant target as well as reservoirs.¹⁰

Unlike the HFMD epidemics occurred in India^{7,8,9,10,11,12,13}, in the present study younger children were predominantly affected – 96% were less than five years old of which 24% were infants. It is highly contagious, transmitted through faeco-oral route (principal mode of transmission¹⁰), oro-oral route and by droplet infection. In the present study 80% of cases had a positive contact history.

The incubation period is from three to six days. During epidemics the virus is spread by horizontal transmission. Initial viral implantation in the buccal and ilial mucosa is followed by spread to lymph nodes within 24 hours.¹⁵ Viraemia rapidly ensues with spread to the oral mucosa and skin. After a week neutralizing antibody levels increase and the virus is eliminated with the clinical clearance in one to three weeks.

Clinically HFMD starts with prodromal symptoms of fever, malaise, sore throat, and sometimes vomiting followed by painful oral ulcers on buccal mucosa, tongue, and hard palate. Oral lesions begin as erythematous macules that evolve into two to three millimeters vesicles on an erythematous base, which rapidly become ulcerated. They are painful and may interfere with feeding.¹⁵ Erythematous; papular or vesicular skin lesions usually follow this initial phase of enanthem. These lesions localized predominantly on palms and soles. Less commonly perioral skin and the lateral and dorsal surface of hands and feet can be affected.¹⁶ Buttocks and genitalia can also be involved.¹⁷ Cutaneous lesions usually resolve within two weeks without any complications.

In the present study prodromal symptoms of varying intensity were noted in all the patients. Oral lesions were present in 80% of cases of which 75% of them had drooling of saliva and refusal to feeds. Apart from the classical cutaneous sites involved, strikingly all the cases had classical lesions on buttocks. Few patients also presented with lesions on the trunk.

The differentials for cutaneous lesions include varicella, papular urticaria, impetigo, and pompholyx, but the constellation of features is unique to aid instant clinical diagnosis with certainty in almost all cases. Oral erosions in HFMD are usually more uniform, smaller and mild symptomatic unlike those in herpetic gingivostomatitis, which are painful and coalesce, and those of varicella usually last longer and always crust. Herpangina is a viral infection of the children caused by a Type A coxsackievirus, which presents with similar types of oral ulcers extensively involving the tonsils, pharyngeal mucosa, soft palate and the posterior part of buccal mucosa.¹⁸

The diagnosis of HFMD is mainly based on clinical grounds. The virus can be isolated and identified via culture, immunoassay, serologic testing, polymerase chain reaction and microarray technology. However, laboratory studies are usually needless for diagnosis.

Treatment of HFMD is usually supportive. Adequate fluid intake is needed to prevent dehydration. Fever is treated with antipyretics. Pain may be treated with standard doses of acetaminophen or ibuprofen. Acyclovir had showed dramatic improvement in severe cases.¹⁹

In the present study all the patients were treated symptomatically. The lesions had subsided within three weeks. Children with severe symptoms were given Acyclovir 200 mg in divided doses. Rapid symptomatic relief was noticed suggesting the role of systemic acyclovir in HFMD.

Recurrence is rare, however in present study four patients had recurrence within three months of initial episode. Complications from the viral infections that cause HFMD are rare, but if present, immediate medical treatment is required. A minority of individuals with HFMD may require hospital admission due to uncommon neurologic complications such as encephalitis, meningitis, or acute flaccid paralysis. Non-neurologic complications such as myocarditis, pleural effusion, or bleeding into the lungs may also occur.²⁰ In the present study none of the children had systemic complications.

HFMD is becoming a major public health issue in Asia and has global pandemic potential. It is an emerging infection that has overwhelmed countries in the Asia-Pacific region over the past two decades. On average, more than one million cases have been recorded in China annually since 2008.²¹

In India HFMD epidemics are on the raise. Since 2013 seven states of India had recorded epidemics. This is the first time an epidemic of HFMD was recorded in Andhra Pradesh.

It is well known that E71 infection can be associated with serious neurological and non-neurological complications.²² In a continuous surveillance since 1998 in Taiwan, it has been observed that the disease that was benign

initially, acquired more virulence in the subsequent years.²³

Clinical distinction among the disease caused by different viruses is impossible and in resource poor country like India laboratory confirmation is difficult. Contemplating all these facts, it becomes imperative that close monitoring of the disease in India is essential.

Prevention: Currently, there is no specific vaccine or antiviral therapy against HFMD but such vaccines are being developed.²³ HFMD is highly contagious and is transmitted by nasopharyngeal secretions such as saliva or nasal mucus, by direct contact, or by fecal-oral transmission. Education regarding hygienic precautions is very important to control the spread. These measures have been shown to be effective in lessening the transmission of the viruses responsible for HFMD.²⁴

Declaration of Patient Consent: The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflict of Interest : None

Source of funding support: Self

How to cite this article: T. Vani, S. Nageswaramma, Srinivasa Rao Mudavath, D. Rakesh Ranen, B. Srujan Kumar, G. Prem Sagar. Clinico-epidemiological study of hand foot & mouth disease. *Nat J Res Community Med* 2019;8(1): 70-73.

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