



**INTERNATIONAL JOURNAL OF  
PHARMACEUTICAL SCIENCES**  
[ISSN: 0975-4725; CODEN(USA): IJPS00]  
Journal Homepage: <https://www.ijpsjournal.com>



## Short Communication

# Exploring Hand, Foot, Mouth Disease: A Detailed Case Series Analysis

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## ARTICLE INFO

Received: 24 July 2024

Accepted: 05 Aug 2024

Published: 06 Aug 2024

### Keywords:

HFMD-  
(hand,foot,mouth,disease),  
Coxsackievirus,  
Enterovirus(EV).

### DOI:

10.5281/zenodo.13234404

## ABSTRACT

HFMD is also known as Tomato fever is a viral disease causing skin irritation, dehydration, and rashes. The symptoms include fever, fatigue, nausea, dehydration, rashes, diarrhea etc. It is caused by the Coxsackievirus. There is no specific treatment but it is treated based on the signs and symptoms of the patient. The diagnosis of the diseases, mainly based on the symptoms like blisters, rashes over the body and fevers<sup>[6]</sup>. This paper is a case series of a pediatrics patient with HFMD and provide a in-depth information about the demographics, clinical presentation, treatment outcomes, and epidemiological patterns. Understanding these aspects can leads to improved management strategies and better care for individual affected by this infectious disease.

## INTRODUCTION

Tomato fever or tomato flu is also known as HFMD disease (Hand, Foot, Mouth Disease). It is caused by coxsackievirus and it is highly contagious viral infection common in young children. It can spread through contact with unwashed hands, feces, saliva, mucus, or fluid from the blisters. Kids under 7 are more susceptible to HFMD, and it often spreads in place where children are in close proximity, like school

and childcare centers. The incubation period ranges from 3-6 days<sup>[1]</sup>.

The HFMD was first reported in New Zealand in 1957, and in 1958, coxsackievirus A16 was identified in Canada. HFMD is generally considered to be a self-limiting disease with benign nature [11]. The climatic conditions for the spread of Hand, Foot, and Mouth Disease (HFMD) can vary, but it is more commonly observed in tropical and subtropical regions. These regions

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**Relevant conflicts of interest/financial disclosures:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



typically have warmer temperatures and higher humidity, which create favorable conditions for the virus to thrive and spread. The virus can be transmitted through close contact with infected individuals or contaminated surfaces, so practicing good hygiene, such as regular handwashing, is crucial in preventing its spread. In India, Hand, Foot, and Mouth Disease (HFMD) is commonly seen in various parts of the country. It is more prevalent in areas with higher population density, such as urban and semi-urban regions. Some states in India where HFMD cases have been reported include Kerala, Tamil Nadu, Karnataka, Maharashtra, and Uttar Pradesh. However, it's important to note that HFMD can occur in other parts of the country as well. In Kerala mainly Kollam and Trivandrum district are highly affected. The disease is highly contagious and spreads through close contact with infected individuals, as well as through respiratory droplets and contaminated surfaces. During the monsoon season, which is typically from June to September are highly prevalent to these diseases. The exact epidemiology, such as the number of cases and specific locations, can vary from year to year and region to region. The pathophysiology of the HFMD is not fully understood, but in case caused by EV71, the virus replicates in lymphoid tissue like the tonsils and small bowel. It can then spread to other organs like the liver, spleen, and CNS. The virus can be shed for several weeks post-infection. The relationship between pathogenesis and viral entry receptors and host factor is still unknown. Symptoms include fever, sore throat, painful blisters like lesion on the tongue, gums and inside of the cheeks, rashes on the palms, soles and sometimes buttocks, loss of appetite, fatigue, vomiting, nausea, dehydration, body aches [3] etc. The diagnosis of the disease is usually made clinically on the basis of symptoms like rashes, fever, sores etc or from throat swab or stool examination [1]. Complication of this disease

include viral meningitis, encephalitis, pneumonia, myocarditis, pancreatitis etc[1]. Clinicians diagnosed the suspected patient as a confirmed case of HFMD based on epidemiological history, clinical manifestations, and laboratory nucleic tests[5]. Clinically, most cases have fever accompanied by rash on hands, feet, mouth, and buttocks. Hand, foot, mouth disease is a coxsackievirus A type 16 in most cases, but the infection are also be caused by many other strains of coxsackievirus and enterovirus. The coxsackievirus is a member of Picornaviridae family, which include non-enveloped single stranded RNA virus<sup>[1]</sup>. The serotypes that are often implicated as causative agents include coxsackievirus A16, enterovirus A71 and recently Coxsackievirus A6. Other less common serotype includes coxsackievirus A4 to A7, A9, B1 to B3 and B5<sup>[1]</sup>. HFMD can be divided into 5 stages – rash, neurological dysfunction, early stage of cardiopulmonary failure, cardiopulmonary failure, and recovery. Most cases only experience the first stage and recover within a week. There are 7 indicators considered as risk factors for HFMD severity, including high fever, nervous system involvement, abnormal respiratory rate and rhythm, circulatory dysfunction, increased white blood cell count, increased blood glucose, and increased blood lactate. Humans are considered to be the only reservoir of human EVs, and both cases and asymptomatic infections can be sources of HFMD infection<sup>[5]</sup>. There is no specific treatment for the disease; symptoms of the disease usually clear up in 7-10 days. Frequent hand-washing and avoiding close contact with people who have hand-foot-and-mouth disease may help lower your child's risk of infection. Based on the symptoms the treatment are suggested. The non pharmacological treatment includes- drink plenty of fluids to avoid dehydration and avoid the consumption of spicy or acidic substances because it may cause discomforts, maintain good personal



hygiene to reduce the spread of disease. And then the pharmacological treatment includes NSAIDS, Antihistamines, topical analgesics to relieve pain of mouth sores, fever, rashes etc.

#### Case One

A 4 years old female pediatric patient came with complaints of fever for one day, rashes in the hand feet and mouth sores. Based on the signs and symptoms the patient was diagnosed as HFMD. The patient was treated with Syrup. Paracetamol (250mg/5ml) 4ml given thrice daily for 2 days, Syrup. Hydroxyzine 3ml twice daily for 5 days, Syrup. Multivitamin 5ml, once daily for 2 weeks and Dermacaloe Lotion for local application.

#### Case Two

A 1 years old male patient was admitted with complaints of fever, rashes all over the hand and feet and mouth sores. Based on the signs and symptoms the patient was diagnosed with HFMD. The patient was treated with Syrup. Paracetamol (120mg/5ml) 5ml given thrice daily for 2 days, Hydroxyzine drops 0.5ml twice daily for 3 days, Syrup. Multivitamin 1ml, once daily for 2 weeks and Dermacaloe Lotion for local application for 5 days.

#### DISCUSSION

HFMD is a mild contagious viral infection in young children<sup>[3]</sup>. The fever may last up to 2-3 days. It is most common in children under 10 years of age, but it can also affect older children's and adult. Its symptoms include painful rash on the feet and hands, as well as ulcers in the mouth. There is no specific treatment and prevention for HFMD, but it normally clears up without treatment within 7-14 days. The first noticeable symptoms are of fever 100-104 degree celsius and sore throat. The treatment are mainly given based on the signs and symptoms and the general treatment options are NSAIDS, liquid diphenhydramine, gargle, which help to coat ulcer, easing in pain<sup>[1]</sup>. In this cases the pediatric patient

was more affected and complaints with fever, rashes, mouth sores and the diagnosis are mainly based on the clinical symptoms and treated with the Antihistamines like Hydroxyzine for rashes, for fever Syrup Paracetamol, lotions and multivitamin.

#### CONCLUSION

HFMD is a common infection that causes mouth ulcers, fever, spots on the hands and feet. Its most common in children particularly those under 10 years of age, but it can affect older children and adults also. It is caused by the Coxsackievirus and is a highly contagious viral infection common in young children. The pathophysiology of the HFMD is not fully understood. There is no specific treatment for the disease, based on the signs and symptoms, the treatment are suggested. In this paper, case series of pediatrics patients with HFMD are discussed.

#### REFERENCE

1. Guerra AM, Orille E, Waseem M. Hand foot and mouth disease.
2. Hand, foot, and mouth disease (HFMD). Centers for Disease Control and Prevention. <https://www.cdc.gov/hand-foot-mouth/index.html> Accessed May 14, 2022.
3. When and how to wash your hands. Centers for Disease Control and Prevention.
4. Zhu P, Ji W, Li D, Li Z, Chen Y, Dai B, Han S, Chen S, Jin Y, Duan G. Current status of hand-foot-and-mouth disease. *Journal of Biomedical Science*. 2023 Feb 24;30(1):15.
5. Saguil A, Kane SF, Lauters R, Mercado MG. Hand-foot-and-mouth disease: rapid evidence review. *American family physician*. 2019 Oct 1;100(7):408-14.
6. World Health Organization. A guide to clinical management and public health response for hand, foot and mouth disease (HFMD).



7. Wang JF, Guo YS, Christakos G, Yang WZ, Liao YL, Li ZJ, Li XZ, Lai SJ, Chen HY. Hand, foot and mouth disease: spatiotemporal transmission and climate. *International journal of health geographics*. 2011 Dec;10(1):1-0.
8. Koh WM, Bogich T, Siegel K, Jin J, Chong EY, Tan CY, Chen MI, Horby P, Cook AR. The epidemiology of hand, foot and mouth disease in Asia: a systematic review and analysis. *The Pediatric infectious disease journal*. 2016 Oct;35(10):e285.
9. Wang, Y., Zhao, H., Ou, R. et al. Epidemiological and clinical characteristics of severe hand-foot-and-mouth disease (HFMD) among children: a 6-year population-based study. *BMC Public Health* 20, 801 (2020). <https://doi.org/10.1186/s12889-020-08961-6>
10. Cox B, Levent F. Hand, Foot, and Mouth Disease. *JAMA*. 2018;320(23):2492. Doi:10.1001/jama.2018.17288
11. Guo J, Cao Z, Liu H, Xu J, Zhao L, Gao L, Zuo Z, Song Y, Han Z, Zhang Y, Wang J. Epidemiology of hand, foot, and mouth disease and the genetic characteristics of Coxsackievirus A16 in Taiyuan, Shanxi, China from 2010 to 2021. *Frontiers in cellular and infection microbiology*. 2022:1705.

**HOW TO CITE:** Lekshmi R, Shaiju S Dharan, Dhanya Dharman\*, Exploring Hand, Foot, Mouth Disease: A Detailed Case Series Analysis, *Int. J. of Pharm. Sci.*, 2024, Vol 2, Issue 8, 2654-2657. <https://doi.org/10.5281/zenodo.13234404>

