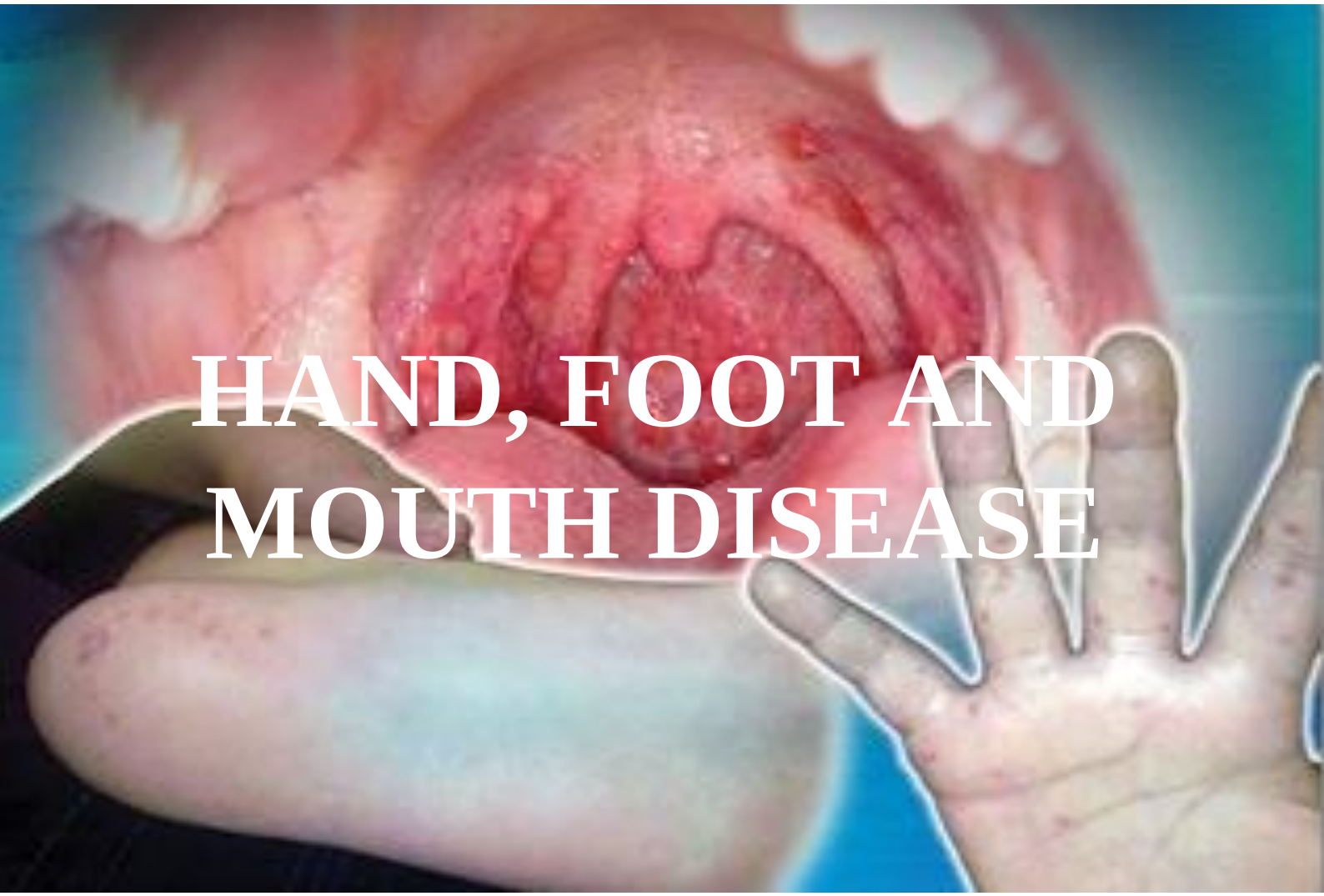

# HAND, FOOT AND MOUTH DISEASE


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In the name of ALLAH, the most merciful, the most compassionate.

I would like to thank God for his mercy and grace, and we hope that God will accept this work with good acceptance.

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## ABSTRACT

Hand, foot and mouth disease (HFMD) is a common viral syndrome, usually self-limiting in children and in adults. It is characterized by fever, mouth ulcers and skin manifestations affecting the palms of the hands, the soles of the feet and the buttocks, with symptoms generally lasting less than a week. Since has the potential to reach epidemic levels in the United States, GPs should be aware of this.


## INTRODUCTION

Hand, foot and mouth disorder (HFMD) is a human syndrome due to intestinal viruses of the Picornaviridae family. The maximum not unusual place strains inflicting HFMD are Coxsackie A virus and Enterovirus71 (EV71). It is a not unusual place viral illness of toddlers and youngsters and is extraordinarily uncommon in adults; however, nonetheless a possibility. Most adults have robust sufficient immune structures to guard the virus, however people with immune deficiencies are very susceptible. It is frequently pressured with foot-and-mouth (additionally called hoof-and-mouth) disorder, a disorder of cattle, sheep, and swine; however, the 2 sicknesses are now no longer related—they're due to specific viruses. Humans do now no longer get the animal disorder, and animals do now no longer get the human disorder **(2).**

## AETIOLOGY

HFMD is as a result of viruses belonging to the enterovirus genus (institution). This institution of viruses consists of polioviruses, coxsackie viruses, echoviruses, and different enteroviruses. The maximum not unusual place motive of HFMD is Coxsackie virus A16. HFMD as a result of Coxsackie virus A16 contamination is a slight disease. Nearly all patients get better in 7 to ten days without clinical treatment. Complications are uncommon, however after they do occur, hospital therapy need to be sought. Rarely, the affected person with Coxsackie virus A16 contamination may also also broaden viral ("aseptic") meningitis wherein the man or woman has fever, headache, stiff neck, or back ache and can want to be hospitalized for a few days. HFMD and outbreaks of the disease have also been linked to enterovirus71 or other enteroviruses. Enterovirus71-caused HFMD has been discovered a greater likelihood of neurologic involvement Fatal Enterovirus 71 has caused encephalitis in certain people. Occurred when there were epidemics **(4,6).**

| | CA16 | | p-value | HEV71 | | p-value | Common enteroviruses | | p-value |
|---|---|---|---|---|---|---|---|---|---|
| | Detected (n = 1094) | Not detected (n = 3659) | | Detected (n = 1067) | Not detected (n = 3696) | | Detected (n = 941) | Not detected (n = 3812) | |
| *Age* | | | | | | | | | |
| ≤ 1 year | 90 (8.2%) | 394 (10.8%) | 0.006* | 75 (7.0%) | 409 (11.1%) | < 0.001* | 117 (12.4%) | 367 (9.6%) | < 0.001* |
| 1-5 years | 949 (86.7%) | 3,024 (82.6%) | | 912 (85.5%) | 3,061 (83.0%) | | 787 (83.6%) | 3,186 (83.6%) | |
| >5 years | 55 (5.0%) | 241 (6.6%) | | 80 (7.5%) | 216 (5.9%) | | 37 (3.9%) | 259 (6.8%) | |
| | | | | | | | | | *Gender* |
| Female | 434 (39.7%) | 1,439 (39.3%) | 0.860 | 442 (41.4%) | 1,431 (38.8%) | 0.126 | 340 (36.1%) | 1,533 (40.2%) | 0.023* |
| Male | 660 (60.3%) | 2,220 (60.7%) | | 625 (58.6%) | 2,255 (61.2%) | | 601 (63.9%) | 2,279 (59.8%) | |
| *Hospitalization* | 100 (9.1%) | 425 (11.6%) | 0.021* | 261 (24.5%) | 264 (7.2%) | < 0.001* | 88 (9.4%) | 437 (11.5%) | 0.072 |
| *Critical cases* | 7 (0.6%) | 59 (1.6%) | 0.017* | 42 (3.9%) | 24 (0.7%) | < 0.001* | 9 (1.0%) | 57 (1.5%) | 0.275 |
| *Deaths* | 0 (0.0%) | 3 (0.1%) | 1.000 | 1 (0.1%) | 2 (0.1%) | 0.534 | 0 (0.0%) | 3 (0.1%) | 1.000 |

* Indicates a significant association between the corresponding variable and the viral infection.

**TABLE 1. Association between virus type and clinical characteristics.**

## RECORDED OUTBREAKS

Person cases and flare-ups of HFMD occur worldwide. In calm climates, cases happen more often in summer and early harvest time. Since 1997, outbreaks of HFMD caused by Enterovirus 71 have been detailed in Asia and Australia **(5).**

- In 1997, 34 children kicked the bucket in a flare-up in Sarawak, Malaysia.
- In 1998, there was an episode in Taiwan, affecting basically children. There were 405 cases with serious complications, and 78 children died. The add up to number of cases is evaluated to have been 1.5 million.
- In 2006, 7 individuals passed on in a flare-up in Kuching, Sarawak (concurring to the Modern Straits Times, March 14).
- In 2007, April 15–21: 688 detailed cases in Singapore.
- In 2007, May 30: Over 30 detailed cases in the Maldives.
- In 2008, a flare-up in China, starting in March in Fuyang, Anhui, driven to 25,000 infections, and 42 passing's by May 13th. Similar outbreaks were detailed in Singapore (more than 2,600 cases as on April 20th, 2008), Vietnam (2,300 cases, 11 passing's), and Mongolia (1,600 cases).

## ROUTE OF INFECTION

Infection is spread from individual to individual by direct contact with irresistible infection which is found in the nose and throat emissions, spit, rankle liquid, and stool of contaminated people. The infection is most often spread by people with unwashed, virus contaminated hands and by contact with virus contaminated surfaces. Infected people are most infectious amid the first week of the ailment. They can still pass the infection to other individuals indeed in spite of the fact that he/she appears well. A few people who are tainted and excreting the infection, counting most grown-ups, may have no indications. HFMD isn't transmitted to/ transmitted from pets or other creatures **(3).**

## AGE GROUP

happens basically in children beneath 10 a long time of age, but it can happen in grown-ups as well. Everybody is at risk of obtaining disease with infections that cause HFMD, but not everybody who gets contaminated becomes ill. Newborn children, children and teenagers are more likely to be vulnerable to disease and sickness from these viruses since they are less likely to be safe to them than grown-ups. Numerous grown-ups have developed protective antibodies due to past exposures to the infections. Disease comes about in insusceptibility to the specific infection, but a moment scene of HFMD may occur taking after disease with a distinctive part of the enterovirus bunch **(1).**

## RISK ASESSMENT

**Risk of individual infection**: All those who get exposed to the infection are at chance but not everyone who is contaminated gets to be sick. Youthful children under 5 a long time of age are most vulnerable. The clinical sign of most cases is gentle. Since enteroviruses are ubiquitous, it is likely for adults and more seasoned children to have resistance. The main transmission course for Enterovirus71 is via respiratory beads, contact with liquid in the blisters or contact with tainted dung. The risk of transmission can be minimized by avoiding contact with known contaminated people or activities that include hazard and by moving forward individual hygiene **(7,8,9).**

**Risk of transmission**: HFMD could be a generally common disease. There have been a number of flare-ups of EV71 HFMD within the Asia-Pacific locale since 1997. Outbreaks have been reported in Bulgaria (1975), Malaysia (1997), Australia (1999), Singapore (2000) and other ranges within the locale. In China, an outbreak of HFMD due to EV71 was detailed in Taiwan Province in 1998 with a add up to number of 129,106 cases of HFMD and Herpangina, of which 405 cases were extremely sick and 78 cases were deadly **(7,8,9)**.

# CLINICAL FEATURES

HFMD is characterized by fever, bruises in the mouth, and a skin hasty.
It starts with gentle fever, poor craving, disquietude, and regularly a sore throat. One or two days after the fever starts, difficult sores develop within the mouth. They start as small red spots that rankle and after that regularly gotten to be ulcers. The bruises are more often than not found on the tongue, gums, and interior of the cheeks **(13,17).**

## Chief symptoms

- Fever.
- Sore throat.
- Ulcer in the throat, mouth and tongue.
- Headache.
- a rash with vesicles (small blisters, 3-7 mm) on hands, feet and diaper area. The vesicles are usually on the region facet of the hands, the only side of the feet and are terribly characteristic in look.
- Loss of appetite.


**Figure 1. (A) Palmar lesions in a previously healthy 16-month-old boy, typical of those seen in hand, foot, and mouth disease (HFMD). He also had features of atypical HFMD inthat he presented with an eruption resembling eczema herpeticum, with lesions negative for herpes simplex virus 1 and 2 by polymerase chain reaction testing. (B) Sole of the foot of the same patient. (C) Hard- and soft-palate lesions in a 31-year-old man diagnosed with HFMD who also had concomitant vesicular lesions on his palms and soles. (D) Onychomadesis in a 3-year-old boy diagnosed with HFMD (10).**

**In severe cases, the patient has at least one of the following:**

- Continuous high fever.
- Weakness, vomiting, irritability, etc.
- Abnormal white blood cell count.
- High blood glucose level.
- Poor blood circulation of limbs.

| | Hand, foot, and mouth disease | Herpangina | Aphthous ulcers ("canker sores") | Herpetic gingivostomatitis |
|---|---|---|---|---|
| **Cause** | Coxsackievirus A16<br>Enterovirus 71<br>Others | Coxsackievirus A | Unclear<br>Consider systemic disease (Behçet, human immunodeficiency virus infection) | Herpes simplex virus 1 |
| **Age group** | Children younger than age 10 and adult contacts | Children ages 3 to 10 | More common in children and adolescents | Infants and young children |
| **Typical features** | Vesicles that become ulcers<br>Involvement of the tongue, palate, and buccal mucosa | Ulcers that affect the pharynx, tonsils, and soft palate.<br>Little tendency to bleed | Painful, shallow ulcers surrounded by erythema<br>Tendency to remain isolated<br>Not present in keratinized surfaces<br>Recurrent aphthous stomatitis is the most common cause of oral ulcers | Tendency to coalesce<br>Perioral vesicular lesions common<br>Gingivae bleed easily<br>Prodromal symptoms include fever |
| **Seasonal incidence** | Spring and early summer | Summer and early fall | No | No |

**Table 2. Oral ulcer: differential diagnosis of HFMD.**

| | Hand, foot, and mouth disease | Varicella | Erythema multiforme | Drug eruption |
|---|---|---|---|---|
| **Cause** | Coxsackievirus A16<br>Enterovirus 71 | Varicella-zoster virus | Herpes simplex virus | Exposure to drug |
| **Age group** | Children under the age of 10 and adult contacts | Most cases in preadolescent children | Most cases age 20 to 40 | Any |
| **Typical features** | Exanthem affecting the palms and soles lasting less than 7 to 10 days, sometimes preceded by painful oral ulcers | Subcentimeter lesions associated with intense pruritus<br>Spreading from face and trunk to extremities (centrifugal)<br>Vesicles with central umbilication ("dewdrop on a rose petal") and subsequent crusting | Target lesions 1 to several centimeters in diameter | Morbilliform or maculopapular exanthema most common<br>Pruritus<br>Starts in the trunk and may spread to other areas |

**Table 3. Skin rash: Differentials diagnosis of HFMD.**

## COMPLICATIONS

Complications from the viral infections that cause HFMD are not common, but if they do occur, medical care should be sought.

Viral or aseptic meningitis rarely occurs with HFMD. Viral meningitis causes fever, headache, stiff neck, or back pain. The condition is usually mild and clears without treatment, however, some patients may need to be hospitalized for a short time. Other more serious diseases, such as encephalitis or polio-like paralysis may occur very rarely but encephalitis can be fatal **(11,12).**

## DIAGNOSIS

HFMD is one of the numerous diseases that result in mouth bruises. Be that as it may, wellbeing care suppliers can usually tell the distinction between HFMD and other causes of mouth bruises by considering the patient's age, the indications detailed by the persistent or parent, and the appearance of the hasty and/or bruises. Samples from the throat or stool can be despatched to a laboratory to check for the virus concerned in causing the illness, which may also take 2–four weeks to achieve the laboratory results, so fitness care vendors usually do now no longer order tests. The trying out need to be finished for research of an outbreak, in order that preventive measures may be initiated **(14,15).**

### SAMPLE COLLECTION

- Throat and fecal samples should be collected within 48 hrs of illness.
- CSF can be collected within 48 hrs if the patient has encephalitis.
- Biopsy of lesion.
- Skin scraping of lesion in viral transport media.
- For serology: 4-fold rise in neutralizing antibody within 14 days, one acute sample at the onset of illness and the second after 10 days of illness.

### TRANSPORTION

Sample should be transported to the laboratory on ice for virus isolation and serology within 24 hrs. If the sample cannot be sen immediately, it should store at -20 c for 2-3 days and sent on ice to the laboratory at the earliest.

## TREATMENT

There is no specific treatment for HFMD. Individual symptoms such as fever, lameness and pain from the sore, may be eased with of the use medication. Symptoms can be treated to provide relief from pain from mouth sores, fever and ache **(16, 11):**

- Fever should be treated with antipyretics.
- Pain can be relieved with acetaminophen, ibuprofen or other over-counter pain relievers
- Mouthwashes or spray that numb pain can be used to lesson mouth pain.
- Fluid intake should be emphasized to prevent dehydration, if moderate-severe dehydration develops IV fluid can be administered.
- HFMD is a viral disease that is self-limiting, so many doctors may not prescribe medicine for this disease unless severe infection. infection in older children , aldosents and adults normally last for 3 days.
- Only small number of people may need hospital admission, mainly as a result of neurological complications as encephalitis, meningitis and acute flaccid paralysis or from pulmonary edema

## PREVENTION

Specific preventive tools for HFMD are not available, but the risk of infection can be lowered by following good hygiene practices **(15).**

Preventive measures include:

- Washing hands frequently and correctly especially after changing diapers and after using the toilet.
- Children should be kept away from crowded public places such as school, markets etc.
- Cleaning dirty surfaces and soiled items, including toys, first up with soap and water and then disinfecting the by cleansing with a solution of chlorine bleach.
- Avoiding close contact with people having HFMD.

## VACCINATION

No vaccine is available to protect against the enteroviruses that cause HFMD **(15).**

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