Hand, Foot, and Mouth Disease
(Enterovirus EV-71, Coxsackievirus CVA-16)
Essential Information
Hand Foot and Mouth Disease (EV-71, CVA-16)

Origins

Hand, Foot, and Mouth Disease (HFMD) is a common viral illness which usually affects infants and children under the age of 5. While it can also occur in adults, it is much less common. HFMD can be caused by a number of different enteroviruses. Enteroviruses are members of the Picornaviridae family of viruses, which includes poliovirus, coxsackieviruses, echoviruses, rhinoviruses, and other enteroviruses.

The most common sources of HFMD are enteroviruses species A (HEV-A), particularly enterovirus 71 (EV-71), which is the most common cause of HFMD globally, and several coxsackieviruses including A16 (CVA16), A6 (CVA6), A5 (CVA5), and A10 (CVA10), which are all enteroviruses. CVA16 is the most common cause of HFMD in the US. Most people infected with HFMD recover within 7-10 days without medical treatment and complications are uncommon, but can occur. HFMD infections caused by coxsackieviruses tend to be mild, while cases with severe complications, including death, tend to occur with EV-71 infections.

Hand, Foot, and Mouth Disease is often confused with Foot and Mouth (F&M) disease (also called Hoof and Mouth disease), which is a common disease in cattle, sheep, and swine. However, Foot and Mouth disease is caused by different viruses and the diseases are not believed to be related. Humans do not get the animal disease (F&M) and animals do not get the human disease (HFMD).

Enteroviruses are often detected in the respiratory secretions (mucus, saliva and sputum) and feces of infected people. While historically polio was the most significant enterovirus infection, global vaccination programs against poliovirus have greatly reduced the prevalence of polio. Non-polio enteroviruses have a high mutation rate and there are more than 200 non-polio enteroviruses causing diseases such as the common cold, flaccid paralysis, aseptic meningitis, myocarditis, conjunctivitis, and hand, foot and mouth disease.

The number of cases of HFMD that occur globally each year is not well tracked, but outbreaks occur regularly, indicating that HFMD infections are common. While anyone can become infected with HFMD, infants and children under the age of 5 are most commonly infected. Within this document, we will use the term HFMD to refer to infections from any of the pathogens that can cause HFMD to simplify the terminology.
Symptoms and Diagnosis

Usually 3-7 days after infection, a person will start to show symptoms. The initial symptoms of HFMD are:

- High fever lasting 24-48 hours
- Poor appetite
- Sore throat
- A general feeling of being unwell (malaise)

1-2 days after the fever starts, painful sores (herpangina) develop in the mouth (often the back of the mouth) that start as small red spots which blister and can become ulcers. The mouth sores can make it painful to swallow, so especially for young children, they may not drink enough liquids and may become dehydrated.

A non-itchy skin rash generally develops over 1-2 days on the palms of the hands, soles of the feet, or less frequently, on the knees, elbows, buttocks, or genital area. The rash has flat or raised red spots, sometimes with blisters, however persons with HFMD may only get some of the symptoms.

Complications, while rare, do occur and can include the following. While rare, HFMD can be fatal.

- Meningitis, which causes fever, headache, stiff neck, and/or back pain
- Encephalitis (swelling of the brain)
- Temporary fingernail and/or toenail loss
- Permanent brain damage
- Death (rare)

Performing a diagnosis on a person infected with HFMD can be difficult because many of the symptoms likely to present early in the illness are often seen in patients with other diseases. Diagnosis and treatment should only be performed by a trained physician who can rule out other potential diseases. Because a number of viruses can cause HFMD, recovery from having it once does not guarantee that a person will not become infected again.

Method of Transmission

The viruses that cause HFMD can be found in an infected person’s:

- Fluid from blisters in the mouth, hands, buttocks, or other locations on the body
- Respiratory secretions (saliva, mucus, or sputum)
- Feces

Generally a person with HFMD is most contagious during the first week of illness, but an infected person can be contagious for days or weeks after symptoms stop. Some people, especially adults, may carry the virus, not develop any symptoms, and still be contagious for some period of time. Even if an infected person does not develop visible symptoms, they may disperse viable virus onto themselves, onto other people, or into the environment. People recently infected with HFMD can shed the virus from their respiratory tract and feces for up to several weeks and can do so with no visible symptoms.
A person can become infected through:

- Close personal contact with an infected person (direct transmission). This can include intimate contact, such as hugging, kissing, sharing drinking cups or eating utensils
- The air (droplets from coughing or sneezing by an infected person)
- Contact with contaminated feces
- Contaminated objects and environmental surfaces (indirect transmission)
- Waterborne transmission, such as from a swimming pool with inadequate levels of chlorine (although relatively uncommon)
- HFMD is NOT transmitted to or from pets or animals

Coughing and sneezing by an infected person can disperse droplets of respiratory secretions (saliva, mucus, and sputum) into the air, which can settle on the infected person’s but does occur. The mechanism of transmission between birds and people is believed to be inefficient, which is why even when there are outbreaks of avian influenza in bird and poultry populations, bird to human transmission occurs rarely and when it does occur, very few additional people become ill through secondary infections. Thus the risk of Avian Influenza infecting large number of people is believed to be low according to experts at the CDC and WHO.

Prevention

There are currently no vaccines against HFMD. There are also no antiviral treatments. Supportive care is used to reduce the severity of symptoms, including an emphasis on staying well hydrated.

In non-healthcare settings, frequent hand hygiene, such as after using the toilet or when changing a baby diaper, increased frequency of surface disinfection, and respiratory hygiene are recommended to reduce the risk of HFMD infection. In the general public, a person can lower their risk of infection through:

- Avoiding close contact with people infected with HFMD
- Avoid sharing drinking cups and eating utensils with an infected person
- Frequent hand hygiene, especially when around people infected with HFMD
- Cleaning and disinfecting commonly touched objects (including children’s toys) and surfaces using a cleaner/disinfectant capable of killing enteroviruses.

In a healthcare setting, Standard, Contact, and Droplet precautions would be indicated. Healthcare workers caring for a patient with HFMD, risk exposure when providing care and should follow precautions as outlined below:

- Hand hygiene as per the WHO five moments and before/after glove use.
- Appropriate Personal Protective Equipment (PPE), including gloves, fluid resistant gowns, and masks. Use of eye protection (face shield or goggles) for Healthcare workers is also recommended if there is a potential for exposure to contaminated secretions, as would usually be anticipated with respiratory infections.
- Environmental Infection Control as appropriate. Use of a country governmental approved disinfectant effective against human enteroviruses for environmental surface disinfection. Standards procedures for food utensils and dishware.
- Treat all blood and body fluids as potentially infectious and decontaminate.
- Respiratory hygiene/cough etiquette to prevent the spread of contaminated respiratory secretions.
- Masking Patients: Known or suspected HFMD patients traveling in a Healthcare facility outside their room may need to wear a mask to minimize the risk to others.
- Patient Placement/Isolation of suspected HFMD patients from contact with unprotected persons. During patient transport, cover or contain contaminated areas of the patient’s body with PPE.
- Fabric Handling ensuring soiled fabric is handled in a way to prevent transmission. Standard Healthcare laundering procedures for contaminated fabric are capable of making the fabric hygienic.
- Safe Injection Practices to ensure multi-use vials of medication and reuse of needles does not infect additional patients. Also ensure lumbar punctures do not create risk for healthcare workers through proper use of PPE.
References and useful websites: If you have any questions, please contact Diversey Customer Service at your local number. Much of the information used in the development of this brochure was taken from the sites listed below:


http://www.wpro.who.int/emerging_diseases/documents/HFMDGuidance/en/

http://www.wpro.who.int/mediacentre/factsheets/fs_10072012_HFMD/en/
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