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23 May 2007

Dear doctor,

### **Guideline on Hand-foot-mouth Disease (HFMD) Management**

The Centre for Health Protection (CHP) has developed a guideline on management of the Hand-Foot-Mouth Disease (HFMD) in health care settings to facilitate doctors to make timely diagnoses and provide appropriate care for HFMD. The guideline is developed with reference made from the Hospital Authority and the Scientific Committee on Enteric Infection and Foodborne Diseases and the Scientific Committee on Infection Control. Special emphasis has been placed on indication of laboratory studies, criteria for hospital admissions, and infection control measures.

HFMD is a viral infection commonly seen in children, with more cases observed during summer seasons, generally from May to July. The main symptoms of HFMD are fever, sore throat and skin rash over the hands and feet. Although the illness is usually self-limiting, some cases caused by EV71 virus may be associated with complications such as myocarditis, encephalitis or poliomyelitis-like paralysis. No specific treatment is available for HFMD. Good hygiene practices are the most important measures to prevent HFMD. Although an increasing trend of HFMD is not observed recently, there was one report of EV71 infection affecting a 3-year-old boy in early May 2007. He presented with HFMD symptoms and was fully recovered.

Besides conducting epidemiological investigation and implementing control measures, CHP has issued letters to schools, kindergartens and child care centres alerting them of the situation and to take appropriate measures.



Enclosed please find the guideline on managing HFMD for your reference. In view of the coming HFMD peak season, we enlist your support in providing the following health advice to parents whose children suffer from HFMD:

- Do not let children attend nurseries/kindergartens/schools until all vesicles have dried up.
- Keep children at home while symptomatic and do not let them attend activities that mix with other children, e.g. birthday party, interest classes, swimming pool.
- Wash hands thoroughly after changing diapers or handling respiratory secretions of their children
- Clean thoroughly toys or appliances which are contaminated by the child's secretions with 1:49 diluted household bleach.

If you encounter an increase in the number of clients with HFMD coming from the same institution, please inform the Central Notification Office of CHP as early as possible at Fax: 2477 2770 or Tel: 2477 2772. CHP will start epidemiological investigations and take appropriate control measures. More information is also available at the website of CHP at ([http://www.chp.gov.hk/health\\_topics.asp?lang=en&id=24&pid=9](http://www.chp.gov.hk/health_topics.asp?lang=en&id=24&pid=9)).

Yours sincerely,



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## **Management of Hand Foot Mouth Disease (HFMD) in Health Care Settings**

### **1. Introduction**

- 1.1 HFMD is usually a mild disease and can often be managed in outpatient setting. However, some patients, especially those cases associated with EV71 infection, may suffer from rapid deterioration. Awareness among clinicians is essential for timely diagnosis and treatment.
- 1.2 This guideline has been developed by the Centre for Health Protection (CHP) based on “The Fact Sheet on Enteroviral Infection for Hospitals” issued by Hospital Authority Central Committee on Infectious Diseases in June 2004 with incorporation of epidemiology information and advice on management in primary care settings. Special emphasis has been placed on indications for laboratory studies, referral for hospital admission, and infection control measures. This guideline has been reviewed by the Scientific Committees of Enteric Infection and Foodborne Diseases and Infection Control of CHP.

### **2. The Clinical Syndrome**

- 2.1 HFMD is a common childhood infectious disease in Hong Kong. Common signs and symptoms are fever, sorethroat, and skin rash. In most cases, the illness is self-limiting. The rash usually appears over fingers and palms, feet (including soles) and other parts of the body such as buttocks and thighs. Vesicles can also be found in the oral cavity especially on the tongue and soft palate. Fever may persist for 4 to 5 days. In most cases, the fever, rash and ulcers subside spontaneously in one week and full recovery is usual. Complications are uncommon. Rarely, this illness may be associated with meningitis.
- 2.2 HFMD caused by EV71 infection may be complicated by myocarditis, encephalitis or poliomyelitis-like paralysis.

### **3. Epidemiology**

- 3.1 HFMD is mainly transmitted by the faecal-oral route and respiratory droplets. Direct contact with open and weeping skin vesicles or contaminated objects may also transmit the virus. The incubation period for HFMD is 3 to 7 days.
- 3.2 The infectious period starts from several days before the appearance of symptoms and peaks within one week of disease onset. The virus may be excreted in stools for several weeks and can survive for days on fomites at room temperature.
- 3.3 In Hong Kong, enteroviral infections peak in May to July. Young children are its main target

and reservoir but adults can also be infected. From 2000 to 2006, the annual number of EV71 isolates detected at CHP's Public Health Laboratory Services Branch was between one to 40.

#### 4. Causative Agents

- 4.1 HFMD is caused by some species of enteroviruses<sup>1</sup>. Enteroviruses<sup>2</sup> refer to a group of small RNA viruses with a diameter of 24-30nm comprising four species, namely *Polioviruses* (3 serotypes), *Coxsackieviruses* (group A: 23 serotypes, group B: 6 serotypes), *Echoviruses* (31 serotypes) and *Enteroviruses type 68-71*. The commonest cause for HFMD is *Coxsackieviruses* A16. Other types of enteroviruses have also been associated with this syndrome, such as coxsackievirus A4, A5, A9, A10, B2, B5 and EV71.
- 4.2 Infections caused by enteroviruses other than those causing HFMD can be asymptomatic or mild and self-limited, or cause a wide array of illness, including herpangina, respiratory infections, acute haemorrhagic conjunctivitis, myocarditis, pericarditis, aseptic meningitis, and acute flaccid paralysis.
- 4.3 Compared to other enterovirus, EV71 is more often associated with severe complications such as myocarditis, encephalitis and poliomyelitis-like paralysis.

#### 5. Laboratory Diagnosis

- 5.1 In most mild cases, laboratory studies may not be necessary.
- 5.2 Viral studies for confirming the diagnosis are indicated in patients with any of the following conditions:
- HFMD/ Herpangina/ suspected enterovirus infection with rapid clinical deterioration or complications;
  - Children with fever/rash and rapid clinical deterioration;
    - aseptic meningitis / encephalitis;
    - acute flaccid paralysis;
    - myocarditis.
- 5.3 Specimens should be taken in the early phase of the disease, including;
- Nasopharyngeal aspirates ((NPA) or throat swab (within the first few days of illness);
  - Faeces (shedding continues for a few weeks);
  - Others as appropriate - vesicle fluid, CSF and tissue.

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<sup>1</sup> HFMD is sometimes confused with foot-and-mouth disease of cattle, sheep, and swine. The latter is caused by a virus *Aphthovirus* which belong to the family of *Picornaviridae*.and will not cause human diseases.

<sup>2</sup> Regarding the nomenclature, new Enterovirus types identified after 1969 were assigned Enterovirus type numbers rather than being subclassified into groups like Coxsackieviruses or Echoviruses.

### 5.3 Laboratory studies

- Virus Isolation
  - EV can be isolated by cell culture but this is of variable sensitivity;
  - Specimens, except CSF, should be put in viral transport medium (T/M) and all specimens should be kept at 4°C during transport to the laboratory.
- Serological test is of limited value and is not recommended for definitive diagnosis of enterovirus and is mainly used for seroepidemiological studies;
- RT-PCR: on CSF, throat swab/NPA and stool specimens from patients with CNS disease or rapid clinical deterioration can be arranged with the following laboratories.

### 5.4 Laboratories for specimen testing:

- The following laboratories accept specimens from both public and private doctors. There may be charges for specimens sent by private doctors:
  - The Virology Division, Public Health Laboratory Service Branch of Centre for Health Protection (Guides to requests for laboratory testing are available in CHP website. <http://www.chp.gov.hk/files/pdf/grp-specimenhandbook-en-2004122803.pdf>; or To surf from CHP Home (<http://www.chp.gov.hk/>) > Professionals > Public Health Laboratory > Guide to Requests for Laboratory Testing > 3. Virology ). Specimens should be sent within office hours. Charges will be waived if the specimens are used for investigating outbreaks notified to CHP ;
  - Virology Laboratory, Department of Microbiology at Queen Mary Hospital;
  - Department of Microbiology at Prince of Wales Hospital.
- While transporting the specimens, icepack and a securely closed container made up of insulating material can be used to keep specimens at low temperature.

## 6. Patient Management

6.1 Most cases of HFMD/enterovirus infection are mild and do not require hospitalisation.

6.2 Cases showing the severe symptoms/signs should be considered for hospitalisation or referral for hospitalisation for investigation and treatment. The following are important warning signs:

- Children <3 years old having persistent (>3 days) and high fever (>39°C);
- Signs or symptoms of neurological or cardiac complications:
  - irritability, insomnia, panic attack,
  - abdominal distension, repeated vomiting, photophobia, sleepiness, myoclonic jerks, hallucinations,
  - shortness of breath, cold sweating, poor peripheral circulation, tachycardia(>160/min),
  - limb weakness, unsteady gait, conjugated ocular disturbance, and cranial nerve paresis.
- Advice should be given to parents/patients upon discharge on the above mentioned

warning signs.

### 6.3 Hospitalized patients

- Prompt supportive treatment is the mainstay of patient management. Specific anti-enteroviral agents are not available;
- Secondary cases from household contact could be more severe and require closer observation;
- Early detection of signs of CNS involvement (especially brain stem) is important;
- Patients should be closely monitored for cardiopulmonary decompensation (HR, RR, BP, SaO<sub>2</sub>);
- Careful monitoring and assessment of fluid balance and left ventricular function are important;
- When deterioration is noted, early intubation is desirable since the patient might progress to pulmonary edema rapidly;
- Risk factors for pulmonary oedema are hyperglycaemia, leucocytosis, and limb weakness;
- Consider left ventricular failure and perform early echocardiogram if patient fails to respond to fluid resuscitation.

## 7. Infection Control Measures

7.1 Standard Precautions should be strictly observed to prevent outbreaks in healthcare settings. Contact Precautions are indicated for infants and young children or if the patient is incontinent and may contaminate the environment.

7.2 At the clinic/hospitals, the health care workers should:

- Wash hands immediately and thoroughly after handling patients secretions or excretions irrespective of whether or not gloves are worn;
- Wear gloves and gown during patient-care activities that are likely to involve contact with patient's secretions or excretions; remove the gloves and gown upon leaving the patient's environment;
- Put on personal protection equipments (e.g. mask, face shield) when carrying out procedure that is likely to generate splashes to mucous membranes.

7.3 At clinic setting, patients suspected to have HFMD/enterovirus infection should

- observe personal hygiene;
- wear a surgical mask to cover nose and mouth;
- avoid touching/playing with other patients;

Patient with HFMD/enterovirus infection requiring hospital admission should be placed under contact precaution.

#### 7.4 Disinfection

- Disinfect the patient items properly. Use of 1:50 diluted household bleach (one part of 5.25% hypochlorite solution added to 49 parts of water) would be sufficient for such purpose. Enterovirus is resistant to alcohol and phenolic disinfectants;
- Linen and Waste from patients suffering from HFMD should be handled with care, and wash hands after handling.

#### 7.5 Advice given to the patients or parents:

- Do not let children attend nurseries/kindergartens/schools until afebrile and all vesicles have dried up; or to follow the advice from CHP if there is an outbreak.
- Keep children at home while symptomatic and do not let them attend activities that mix with other children, e.g. birthday party, interest classes, swimming pool;
- Wash hands thoroughly after changing diapers or handling respiratory secretions of their children;
- Clean thoroughly toys or appliances which are contaminated by the child's secretions with 1:50 diluted household bleach (one part of 5.25% hypochlorite solution added to 49 parts of water). Rinse the toys or appliances with water afterwards.

### **8. Early warning and reporting of cases or clusters**

#### 8.1 Surveillance and early warning

- Experiences from overseas countries showed that EV71 infections are often associated with widespread HFMD outbreaks in the community. Hence, it is important to maintain sensitive surveillance of HFMD for early detection of possible EV71 outbreaks. The CHP maintains a series of surveillance systems to monitor HFMD activities and conducts epidemiological investigations and take appropriate control measures on cases or outbreaks reported to the Centre. Warning will be issued by press release and letters to institutions and doctors when there are signs of increase in HFMD activity. Information can be obtained from the CHP website (News and Statistics) or published at the bi-weekly Communicable Disease Watch.

#### 8.2 Reporting of cluster or EV 71 cases

- It is important to ask for any contact history of patient with HFMD or cluster of persons with fever and rash. Suspected clusters of HFMD or confirmed cases of EV71 should be reported to the Central Notification Office of Centre for Health Protection via the following means:
  - Website: <http://www.chp.gov.hk/ceno>.
  - Email: [diseases@dh.gov.hk](mailto:diseases@dh.gov.hk)
  - Fax: 2477 2770
  - Phone: 2477 2772

## Infection Control

- When the case is detected while in hospital, inform the hospital's Infection Control Team and ward staff should carry out appropriate infection control measures.

## 9. References and additional information

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- Scientific Committee on Enteric Infections and Foodborne Diseases. Strategies for the Prevention and Control of EV 71 Infection in Hong Kong: [http://www.chp.gov.hk/files/pdf/sas4\\_ev71\\_20050927.pdf](http://www.chp.gov.hk/files/pdf/sas4_ev71_20050927.pdf)
- Department of Health Hong Kong. Information on Communicable Disease : Hand, foot and mouth disease at <http://www.info.gov.hk/dh/diseases/CD/HFMD.htm>

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**May 2007**