



Science

REVIEW: AN ANALYSIS OF MONKEYPOX DISEASE AND CURRENT SCENARIO IN MALAYSIA

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Abstract

Recently, there is large outbreak of monkeypox virus in Central Africa and this remains as a growing public health threat. The last confirmed case of monkeypox was in 1978 at Nigeria. Monkeypox is now a major threat to global health security, requiring an urgent multidisciplinary approach including virologists, veterinarians, physicians, and public health experts to fast-track the development of diagnostic assays, vaccines, antivirals, and other control strategies. This aim of this manuscript is to provide information on the current state of knowledge about human monkeypox, with emphasis on epidemiologic characteristics, clinical features, diagnosis, treatment, and prevention.

Keywords: Monkeypox; Malaysia; Treatment.

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1. Introduction

The first case of monkeypox was first reported in a 9-month-old child from Zaire in 1970 ^(1, 15). Poxvirus infections are a common cause of cutaneous signs. Monkeypox is regarded as the most important orthopoxvirus infection in human beings since the eradication of smallpox. Monkeypox is a rare zoonotic viral disease caused by the monkeypox virus belonging to the Orthopox virus genus. Other notable members of this group include smallpox, vaccinia, cowpox, camelpox, ectromelia (mousepox) and other viruses ^(2, 16). There is no evidence to date that person-to-person transmission alone can sustain monkeypox in the human population. After smallpox eradication in 1980 and consequent to the cessation of smallpox vaccination, monkeypox emerged as the most prevalent orthopoxvirus infection in humans ⁽³⁾. The high risk of dissemination of this virus is due to the increase in international transport as well as loss of vaccinal protection against smallpox ⁽⁴⁾. Furthermore, trends for new animals as pets also increase the risk of monkeypox transmission

among public. Monkeypox has a wide range of hosts, 4 which has allowed it to maintain a reservoir in wild animals while sporadically causing human disease, and has precluded global eradication by human vaccination ⁽⁵⁾. Effective prevention relies on limiting the contact with infected patients or animals and limiting the respiratory exposure to infected patients.

2. Prevalence of Monkeypox Infection Cases

Monkeypox has been reported in the tropical rainforest region of Central and West Africa. The central and Western Africa includes the region of Democratic Republic of Congo, Cameroon, Central African Republic, Nigeria, Ivory Coast, Liberia, Sierra Leone, Gabon and South Sudan. It is considered endemic in Democratic Republic of Congo with more than 1000 suspected cases per year since 2005. Nigeria reported a large multistate outbreak in 2017 to 2018. In 2003, the Centres for Disease Control (CDC) reported 47 confirmed and probably human monkeypox cases in six (6) states ^(6,17). Cases were infected after contact with prairie dogs purchased as pet, which was earlier kept in proximity with small mammals imported from Ghana. Investigation revealed some patients get infected after touching sick animals, being bitten or scratched, and cleaning cage and the animal's bedding. No cases attributed to human-to-human transmission. In September 2018, the UK reported two imported cases in travellers returning from Nigeria. iii. On 12 October 2018, Israel reported a case, a 38-year-old Israeli man who was working in Nigeria and came back to Israel who had history of contact with dead rodents. Recently, on 9 May 2019, Singapore reported one case, a Nigerian who entered Singapore on 28 April 2019 and had history of consuming bush meat in Nigeria.

3. Mode of Virus Transmission

The monkeypox virus is transmitted to humans through a bite or direct contact with an infected animal's blood, body fluids or cutaneous/mucosal lesions. Monkeypox virus transmission occurs when a person comes into contact with the virus from human, animal or materials contaminated with the virus. It was postulated that the virus enters the body through broken skin, mucous membrane or respiratory tract. Animal to human transmission is possible by bite or scratch, bush meat preparation or direct contact with body fluids or lesion material. Indirect contact with lesion material such as through contaminated bedding may also cause the virus transmission ⁽⁷⁾. Human to human virus transmission is thought to occur mainly through large respiratory droplets. Respiratory droplets generally cannot travel more than a few feet, hence prolonged face to face contact is required for the virus transmission. Other human to human methods of transmission include direct or indirect contact with lesion material or body fluids ⁽⁸⁾.

The reservoir host (main disease carrier) of monkeypox is still unknown although African rodents are suspected to play a part in transmission. The virus that causes monkeypox has only been recovered (isolated) twice from an animal in nature. In the first instance (1985), the virus was recovered from an apparently ill African rodent (rope squirrel) in the Equateur Region of the Democratic Republic of Congo. In the second (2012), the virus was recovered from a dead infant mangabey found in the Tai National Park, Cote d'Ivoire. Human to human transmission is rare and likely to occur by close contact or airborne routes ⁽⁹⁾.

4. Symptoms of Illness

The incubation period is usually 6 to 21 days. The illness typically lasts for two to four weeks. It is characterised by fever, myalgia, headache, lymphadenopathy and rash. The rash which is first seen about two days after fever onset usually starts in the trunk and spreads peripherally to involve the palms and soles. The rash starts as a macules and papules and then progresses to become vesicles and pustules before scabbing and desquamation over a 2-3 week period. Unlike in chickenpox where lesions at various stages of development and healing are seen, in monkeypox all the lesions are generally at the same stage. Lymphadenopathy is observed prior to and concomitant with the rash, which helps differentiate it from smallpox or varicella ⁽¹⁰⁾.

5. Risk of Infection in Malaysia

Introduction of monkeypox case might be related to importation. The risk of its spread in Malaysia is very low due to the limited human-to-human transmission. If there is any, early identification of cases is vital for early case management including isolation and contacts tracing.

6. Identification of New Cases

Case will present with maculopapular or vesicular rash or pustular, generalised or localised, discrete or confluent with one or more of the symptoms such as chilling, sweating, headache, backache, lymphadenopathy, sore throat, cough, shortness of breath with epidemiologic criteria as exposure to a suspect, probable or confirmed human case of monkeypox within the incubation period or exposure to wild, captive or pet mammal from or in the African monkeypox endemic countries within the incubation period ^(11,18).

7. Diagnosis of Monkeypox Infection in Malaysia

National Public Health Laboratory (NPHL) and Institute for Medical Research (IMR) have the capacity to do test for monkeypox virus. Optimal diagnostic specimens are from lesion i.e. vesicular swabs of lesion exudate or crust, stored in a dry sterile tube (without any viral transport media) and send on ice. Blood and serum is useful if taken at the viremia phase. Monkeypox infection is confirmed via isolation of monkeypox virus in culture or demonstration of the virus DNA by PCR test. Probable case of monkeypox is when there is a demonstration of virus morphology under electron microscope or presence of orthopoxvirus in tissue using immunohistochemical test; in the absence of exposure to another orthopoxvirus. Monkeypox cases are classified into three different categories as below.

- 1) Suspect: a clinically compatible case that meets epidemiologic criteria that is awaiting laboratory test result.
- 2) Probable: a clinically compatible case that meets epidemiologic criteria and probable laboratory criteria for monkeypox.
- 3) Confirmed: a clinically compatible case with laboratory confirmed for monkeypox infection.

8. Treatment for Monkeypox Infection

There is no specific treatment or vaccine for monkeypox infection. Monkeypox is usually a self-limited disease with the symptoms lasting from 2 to 3 weeks. Severe symptoms common among children and is related to extent of virus exposure and patient's health status. McSharry JJ et al (2009) reported on an investigational new-drug cidofovir for treatment of variola infection. The use of an acyclic nucleoside phosphonate analogue (ANPA) was also being studied in animal infected with variola virus. A registered ANPA in Malaysia is Tenofovir®. However, no further studies or articles found to support the effectiveness of these drugs in treating monkeypox. CDC Atlanta reported that monkeypox outbreak can be controlled with smallpox vaccine, antiviral cidofovir, ST-246 (tecovirimat) and vaccinia immune globulin (VIG).

9. Management of Monkeypox Spreading

Even though human-to-human infection is limited, health care workers attending to monkeypox patient must implement standard contact and airborne infection control precautions ^(12,19). A monkeypox case should be isolated until all lesions have resolved and scabs separate. Close contact includes of anyone who provided care for the patient including a health care worker or family member, or had other similarly close physical contact should also be isolated. Anyone who stayed at the same place (e.g. lived with, visited) is identified as a probable or confirmed case while the case was symptomatic. Contacts with high risk of infections need to be quarantined and monitored for 21 days from the date of last exposure to the confirmed case; for monkeypox symptoms and signs surveillance. Contacts with low risk of being infected are to be placed under active surveillance with twice daily monitoring of their health status. Asymptomatic contacts should not donate blood, cells, tissue, organs, breast milk or semen while they are under symptom surveillance.

Monkeypox is not in the list of notifiable disease under the Prevention and Control of Infectious Disease Act 1988. However, as it is a new and emerging disease, all suspected or probable or confirmed monkeypox cases must be notified via phone or fax or email to nearest district health office within 24 hours.

10. WHO Recommendation of Travel or Trade Restrictions Related to Monkeypox

At this point of time, based on available information, WHO does not recommend any restriction for travel to and trade with Singapore or Nigeria.

11. Precautions While Travelling to Monkeypox Endemic Countries

Travelers to monkeypox endemic countries should avoid contact with sick, dead or live animals (rodents, marsupials, primates) that could harbor the virus ⁽¹³⁾. Do not eat or handle bush meat. Travellers must always practice good self-hygiene including proper hand hygiene using soap and water. Travellers must practice the use alcohol-based sanitizer when water and soap is no available. Any illness during travel or upon return should be reported to a health professional. Tell the doctor about all recent travel ^(19,20).

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