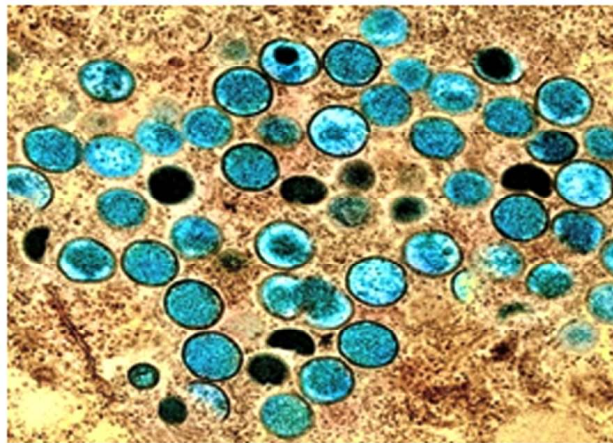


Monkeypox

Shibilamol C Baby



Source: National Institute of Allergy and Infectious Diseases

INTRODUCTION

The disease is called monkeypox because it was first identified in colonies of monkeys kept for research in 1958. It was only later detected in humans in 1970. Monkeypox is an illness caused by the monkeypox virus. It is a viral zoonotic infection, meaning that it can spread from animals to humans. It is caused by infection with monkeypox virus that occurs primarily in tropical rainforest areas of Central and West Africa and is occasionally exported to other regions. Monkeypox virus belongs to the Orthopoxvirus genus in the family Poxviridae. It can also spread from person to person. In most cases, the symptoms of monkeypox go away within a few weeks. However, in some people, an infection can lead to medical complications and even death. Newborn babies, children and people

with underlying immune deficiencies may be at risk of more serious symptoms and death from monkeypox.

1% to 10% of people with monkeypox have died in past years. It is very important to note that death rates in different settings may differ due to a number of factors, such as access to health care. These Fig.s may be an overestimate because surveillance for monkeypox has generally been limited in the past. In the newly affected countries where the current outbreak is taking place, there have been no deaths to date.

TRANSMISSION

Monkeypox can spread to people when they come into physical contact with an infected animal. Animal hosts include rodents and primates. The risk of catching monkeypox from animals can be reduced by avoiding unprotected contact with wild animals, especially those that are sick or dead (including their meat and blood). In endemic countries where animals carry monkeypox, any foods containing animal meat or parts should be cooked thoroughly before eating.

It spreads from person to person through close

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contact with someone who has a monkeypox rash, including through face-to-face, skin-to-skin, mouth-to-mouth or mouth-to-skin contact, including sexual contact. We are still learning about how long people with monkeypox are infectious for, but generally they are considered infectious until all of their lesions have crusted over, the scabs have fallen off and a new layer of skin has formed underneath.

Environments can become contaminated with the monkeypox virus, for example when an infectious person touches clothing, bedding, towels, objects, electronics and surfaces. Someone else who touches these items can then become infected. It is also possible to become infected from breathing in skin flakes or virus from clothing, bedding or towels. This is known as fomite transmission.

Ulcers, lesions or sores in the mouth can be infectious, meaning the virus can spread through direct contact with the mouth, respiratory droplets and possibly through short-range aerosols. Possible mechanisms of transmission through the air for monkeypox are not yet well understood and studies are underway to learn more. The virus can also spread from someone who is pregnant to the fetus, after birth through skin-to-skin contact, or from a parent with monkeypox to an infant or child during close contact. Although asymptomatic infection has been reported, it is not clear whether people without any symptoms can spread the disease or whether it can spread through other bodily fluids. Pieces of DNA from the monkeypox virus have been found in semen, but it is not yet known whether infection can spread through semen, vaginal fluids, amniotic fluids, breastmilk or blood. Research is underway to find out more about whether people can spread monkeypox through the exchange of these fluids during and after symptomatic infection.

EPIDEMIOLOGY

Agent

Monkeypox virus (MPXV) is an enveloped double-stranded DNA virus that belongs to the Orthopoxvirus genus of the Poxviridae family.

Host

Natural reservoir is yet unknown. However, certain rodents (including rope squirrels, tree squirrels, Gambian pouched rats, dormice) and non-human primates are known to be naturally susceptible to monkeypox virus.

Incubation period: The incubation period (interval from infection to onset of symptoms) of monkeypox is usually from 6 to 13 days but can range from 5 to 21 days.

Period of communicability: 1-2 days before the rash to until all the scabs fall off/gets subsided.

Usual onset: 5–21 days post exposure

Duration: 2 to 4 weeks

RISK GROUP

People who live with or have close contact (including sexual contact) with someone who has monkeypox, or who has regular contact with animals are most at risk. Health workers should follow infection prevention and control measures to protect themselves while caring for monkeypox patients. Newborn infants, young children and people with underlying immune deficiencies may be at risk of more serious symptoms, and in rare cases, death from monkeypox. People who were vaccinated against smallpox may have some protection against monkeypox. However, younger people are unlikely to have been vaccinated against smallpox because smallpox vaccination stopped in most settings worldwide after it was eradicated in 1980. People who have been vaccinated against smallpox should continue to take precautions to protect themselves and others.

CLINICAL SYMPTOMS AND SIGNS

Prodrome (0-5 days)

- a. Fever
- b. Lymphadenopathy
 - Typically occurs with fever onset
 - Periauricular, axillary, cervical or inguinal
 - Unilateral or bilateral
- c. Headache, muscle aches, exhaustion
- d. Chills and/or sweats
- e. Sore throat and cough

Skin involvement (rash)

- a. Usually begins within 1-3 days of fever onset, lasting for around 2-4 weeks
- b. Deep-seated, well-circumscribed and often develop umbilication
- c. Lesions are often described as painful until the healing phase when they become itchy (in the

- crust stage)
- d. Stages of rash (slow evolution)
- Enanthem - first lesions on tongue and mouth
 - Macules starting from face spreading to arms, legs, palms, and soles (centrifugal distribution), within 24 hours
 - The rash goes through a macular, papular, vesicular and pustular phase. Classic lesion is vesicopustular
 - Involvement by area: face (98%), palms and soles (95%), oral mucous membranes (70%), genitalia (28%), conjunctiva (20%). Generally skin rashes are more apparent on the limbs and face than on the trunk. Notably the genitalia can be involved and can be a diagnostic dilemma in STD population
 - By 3rd day lesions progress to papules
 - By 4th to 5th day lesions become vesicles (raised and fluid filled).
 - By 6th to 7th day lesions become pustular, sharply raised, filled with opaque fluid firm and deep seated.
 - May umbilicate or become confluent
 - By the end of 2nd week, they dry up and crust
 - Scabs remain for a week before falling off
 - The lesion heals with hyperpigmented atrophic scars, hypopigmented atrophic scars, patchy alopecia, hypertrophic skin scarring and contracture/deformity of facial muscles following healing of ulcerated facial lesions
 - A notable predilection for palm and soles is characteristic of monkey pox
- e. The skin manifestation depends on vaccination status, age, nutritional status, associated HIV status. It occurs in communities where there is often a high background prevalence of malnutrition, parasitic infections, and other significant health compromising conditions.
- f. The total lesion burden at the apex of rash can be quite high (>500 lesions) or relatively slight (<25).

Differential Diagnosis

- Varicella (Chicken pox)
- Disseminated herpes zoster

- Disseminated herpes simplex
- Measles
- Chancroid
- Secondary syphilis
- Hand foot mouth disease
- Infectious mononucleosis
- Molluscum contagiosum.

DIAGNOSTIC EVALUATION

Lymphadenopathy during the prodromal stage of illness can distinguish monkeypox from chickenpox or smallpox on physical examination. Diagnosis can be verified by testing for the virus. Polymerase chain reaction (PCR) testing of samples from skin lesions is the preferred laboratory test. PCR blood tests are usually inconclusive because the virus remains in blood only a short time. To interpret test results, information is required on date of onset of fever, date of onset of rash, date of specimen collection, current stage of rash, and patient age.

PREVENTION

Patient Placement

A patient with suspected or confirmed monkeypox infection should be placed in a single person room; special air handling is not required. The door should be kept closed, if safe to do so. The patient should have a dedicated bathroom. Activities that could resuspend dried material from lesions, e.g., use of portable fans, dry dusting, sweeping, or vacuuming should be avoided. Transport and movement of the patient outside of the room should be limited to medically essential purposes. If the patient is transported outside of their room, they should use well fitting source control (e.g., medical mask) and have any exposed skin lesions covered with a sheet or gown. The person should isolate from others until all of the lesions have crusted over, the scabs have fallen off and a new layer of skin has formed underneath. This will stop passing on the virus to others. Until more is understood about transmission through sexual fluids, use condoms as a precaution whilst having sexual contact for 12 weeks after you have recovered.

Personal Protective Equipment (PPE)

HCW who enter the patient's room should wear the following PPE: Gloves, Gown, Eye protection (goggles or faceshield) that covers the front and sides of the face), N95 filters. HCP should remove

and discard gloves, gown and eye protection, and perform hand hygiene prior to leaving the patient's room; the respirator should be removed, discarded and replaced with a mask for source control after leaving the patient's room and closing the door.

Environmental Infection Control

CDC recommends using an EPA-registered hospital-grade disinfectant with an emerging viral pathogen claim, although most of these are hospital grade disinfectants. Any EPA-registered hospital-grade disinfectant can be used for cleaning and disinfecting environmental surfaces. Take care when handling soiled laundry (e.g., bedding, towels, personal clothing) to avoid contact with lesion material. Soiled laundry should be gently and promptly contained in an appropriate laundry bag and never be shaken or handled in manner that may disperse infectious particles. Activities such as dry dusting, sweeping, or vacuuming should be avoided. Wet cleaning methods are preferred.

Waste (i.e., handling, storage, treatment, and disposal of soiled PPE, patient dressings, etc.) should be managed as medical waste. Reduce the risk of catching monkeypox by limiting close contact with people who have suspected or confirmed monkeypox, or with animals that could be infected. Clean and disinfect environments that could have been contaminated with the virus from someone who is infectious regularly.

If the person advised to isolate at home, do not go out and protect others from infection:

- Isolating in a separate room
- Using a separate bathroom, or cleaning after each use
- Cleaning frequently touched surfaces with soap and water and a household disinfectant and avoiding sweeping/vacuuming (this might disturb virus particles and cause others to become infected)
- Using separate utensils, towels, bedding and electronics
- Doing own laundry (lift bedding, clothes and towels carefully without shaking them, put materials in a plastic bag before carrying it to the washing machine and wash them with hot water > 60 degrees)
- Opening windows for good ventilation
- Encouraging everyone in the house to clean their hands regularly with soap and water or an alcohol-based hand sanitizer.

If the person cannot avoid being in the same room as someone else or having close contact with another person while isolating at home, then do best to limit their risk by:

- Avoiding touching each other
- Cleaning hands often
- Covering the rash with clothing or bandages
- Opening windows throughout the home
- Ensuring anyone in the room with you wear well fitting medical masks
- Maintaining at least 1 meter of distance.

TREATMENT

A vaccine was recently approved for preventing monkeypox. Some countries are recommending vaccination for persons at risk. Many years of research have led to development of newer and safer vaccines for an eradicated disease called smallpox, which may also be useful for monkeypox. One of these has been approved for prevention of monkeypox. Only people who are at risk should be considered for vaccination. Mass vaccination is not recommended at this time. While the smallpox vaccine was shown to be protective against monkeypox in the past, current data on the effectiveness of newer smallpox/monkeypox vaccines in the prevention of monkeypox in clinical practice and in field settings are limited. Studying the use of vaccines for monkeypox wherever they are used will allow for rapid generation of additional information on the effectiveness of these vaccines in different settings.

People with monkeypox should follow the advice of their health care provider. Symptoms normally resolve on their own without the need for treatment. If needed, medication for pain (analgesics) and fever (antipyretics) can be used to relieve some symptoms. It is important for anyone with monkeypox to stay hydrated, eat well, and get enough sleep. People who are self isolating should take care of their mental health by doing things they find relaxing and enjoyable, staying connected to loved ones using technology, exercising if they feel well enough and can do so while isolating, and asking for support with their mental health if they need it. People with monkeypox should avoid scratching their skin and take care of their rash by cleaning their hands before and after touching lesions and keeping skin dry and uncovered. They are unavoidably in a room with someone else, in

which case they should cover it with clothing or a bandage until they are able to isolate again. The rash can be kept clean with sterilised water or antiseptic. Saltwater rinses can be used for lesions in the mouth, and warm baths with baking soda and Epsom salts can help with lesions on the body. Lidocaine can be applied to oral and perianal lesions to relieve pain.

Many years of research on therapeutics for smallpox have led to development of products that may also be useful for treating monkeypox. An antiviral that was developed to treat smallpox (tecovirimat) was approved in January 2022 by the European Medicines Agency for the treatment of monkeypox. Experience with this therapeutics in the context of an outbreak of monkeypox is limited. For this reason, their use is usually accompanied by collection of information that will improve knowledge on how best to use them in future.

COMPLICATIONS

Complications include secondary infections,

pneumonia, sepsis, encephalitis, and loss of vision with severe eye infection. If infection occurs during pregnancy, still birth or birth defects may occur. The disease may be milder in people vaccinated against smallpox in childhood.

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