



MONKEYPOX DISEASE SYMPTOMS, TRANSMISSION AND TREATMENT: AN OVERVIEW

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Article Received: 08 May 2023 || Article Revised: 30 May 2023 || Article Accepted: 20 June 2023

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ABSTRACT

The current multicounty 2022 monkeypox outbreak is the biggest outside of Africa in recorded history. The rising frequency of human outbreaks in recent years has led to the perception that monkeypox, an emerging zoonotic disease, has a high potential for epidemic spread. Healthcare practitioners worldwide are attempting to become familiar with the varied clinical manifestations and therapy of this infection as public health organizations seek to contain the current outbreak. In light of the current outbreaks worldwide, we provide updated information on monkeypox for healthcare professionals in this review. Also, we attempt to outline the conventional and alternative therapies that can effectively treat monkeypox in its most serious form. After researching the most recent information on this devastating illness and its connections, we can say that both conventional and alternative medicine offer excellent treatments.

KEYWORDS: Monkeypox, Zoonotic, Symptoms, Orthodox.

INTRODUCTION

The monkeypox virus, a zoonotic DNA virus closely related to the smallpox virus, was initially discovered in humans in the Democratic Republic of the Congo (formerly Zaire) in 1970. In Africa, sporadic outbreaks of the disease have occurred, mainly due to interactions with wildlife reservoirs, particularly rodents. It has been observed that human-to-human transmission is limited, and most cases outside of Africa are associated with travel. Despite its historical prevalence in certain regions, research on monkeypox has been neglected and underfunded. However, the situation has changed since early May 2022, with more than 3000 reported infections in over 50 countries across five continents. Consequently, the World Health Organization has classified monkeypox as an "evolving disease" and a "moderate public health concern" as of June 23, 2022. The virus can spread through large respiratory droplets, direct contact with skin lesions, and potentially contaminated objects (fomites). While there is no definitive evidence of sexual

transmission through seminal or vaginal secretions, cases of fetal fatalities and vertical transmission have been documented.^[4,5]

In the Democratic Republic of the Congo, where smallpox had been eradicated in 1968, a 9-month-old boy was the first person to be diagnosed with human monkeypox. Since then, the Democratic Republic of the Congo in particular has seen an increase in human cases, with the majority of cases coming from rural, rain forest areas of the Congo Basin.

Since 1970, cases of monkeypox have been documented in 11 African countries, including Benin, Cameroon, the Central African Republic, the Democratic Republic of the Congo, Gabon, Cote d'Ivoire, Liberia, Nigeria, the Republic of the Congo, Sierra Leone, and South Sudan. The precise impact and cost of monkeypox remain uncertain. For example, the Democratic Republic of the Congo experienced an outbreak from 1996 to 1997 that exhibited a higher attack rate and a lower-case fatality ratio compared to typical cases. The simultaneous occurrence of monkeypox and chickenpox epidemics may have influenced the transmission dynamics, although it is important to note that chickenpox is caused by the varicella virus, which is not an orthopoxvirus. Nigeria has reported a significant epidemic, with more than 200 confirmed cases and over 500 probable cases.

Given its impact on countries in West and Central Africa as well as the rest of the world, monkeypox is a disease of global public health significance. The United States of America experienced its first monkeypox outbreak outside of Africa in 2003, which was traced back to contact with pet prairie dogs infected with the disease. These pets had been in close proximity to dormice and pouched rats imported from the Gambia, resulting in nearly 70 cases of monkeypox in the US. Additionally, there have been reported cases of monkeypox among travelers from Nigeria to Israel in September 2018, the United Kingdom in September 2018, December 2019, May 2021, and May 2022, Singapore in May 2019, and the United States of America in May 2019. In May 2022, multiple cases of monkeypox were detected in several countries where the disease is not endemic. Ongoing studies aim to enhance our understanding of the disease's epidemiology, sources of infection, and transmission patterns.

Monkeypox is a zoonotic viral illness, meaning it is a virus that can be transmitted from animals to humans. The symptoms of monkeypox are similar to those observed in smallpox patients, although the disease is generally less severe. Since the eradication of smallpox in 1980 and the discontinuation of smallpox vaccination, monkeypox has emerged as a significant public health concern. It is primarily found in central and west Africa, particularly in regions near tropical rainforests. There have been reported cases of monkeypox occurring in urban areas as well. The disease can infect a variety of animals, including rodents and non-human primates.

MONKEYPOX SYMPTOMS

People with monkeypox get a rash that may be located on or near the genitals (penis, testicles, labia, and vagina) or anus (butthole) and could be on other areas like the hands, feet, chest, face, or mouth. The rash will go through several stages, including scabs, before healing. The rash can initially look like pimples or blisters and may be painful or itchy.

Other symptoms of monkeypox can include

- Fever
- Chills
- Swollen lymph nodes

- Exhaustion Muscle aches and backache
- Headache
- Respiratory symptoms (e.g., sore throat, nasal congestion, or cough)

You may experience all or only a few symptoms Sometimes, people have flu-like symptoms before the rash. Some people get a rash first, followed by other symptoms. Others only experience a rash.^[6]



Generally, it is the more fetal when gone to last stage, similarly according to the stage normally six stages have covered this disease. In first stage the rashes started on the infected area or all over the skin is possibly this condition is known as the macule. In second stage the spots become hard, raised bumps last for 1-2 days, this is the papule stage. Other stage given in the below diagram accordingly.



MODE OF TRANSMISSION

Person to person

Monkeypox is transmitted from person to person through close contact with an individual displaying a monkeypox rash. Close contact includes face-to-face interactions, such as talking, breathing, or singing near each other, which can generate droplets or short-range aerosols. It also includes skin-to-skin contact, such as touching or engaging in vaginal/anal sex, as well as mouth-to-mouth contact like kissing, or mouth-to-skin contact such as oral sex or kissing the skin. The exact mechanisms of airborne transmission for monkeypox are not yet fully understood, and ongoing studies are being conducted to gain more knowledge.

The duration of infectiousness for individuals with monkeypox is still being studied. Generally, they are considered infectious until all their sores have formed crusts, the scabs have fallen off, a new layer of skin has developed underneath, and all sores in the body (including the mouth, throat, eyes, vagina, and anus) have completely healed.

Contamination of the environment with monkeypox virus can occur when an infected person touches items like clothing, bedding, towels, devices, and surfaces. If another person with cuts, abrasions, or accidental contact with their eyes, nose, mouth, or other mucous membranes comes into contact with these contaminated objects, they are at risk of infection. This type of transmission is known as fomite transmission. It can be prevented by promptly washing hands after handling anything that may be infected. There is also a possibility of contracting the virus from contaminated clothing, bedding, towels, or inhaling skin flakes. Experts are still investigating whether this mode of transmission plays a significant role in the ongoing pandemic.

The virus can also be transmitted from a parent with monkeypox to a fetus during pregnancy, during or after birth through skin-to-skin contact, or from an infected parent to an infant or child during close contact.

While asymptomatic infections have been reported, it is unclear whether individuals without symptoms can transmit the disease or if it can spread through other bodily fluids. Live monkeypox virus has been isolated from semen, but it is not yet determined whether infection can occur through semen, vaginal fluids, amniotic fluids, breast milk, or blood. Research is currently underway to gather more information about the potential transmission of monkeypox through the exchange of these fluids during and after symptomatic infection. It should be noted that animals can also be affected by this virus, although there have been limited reported cases in animals.

ANIMAL TO HUMAN TRANSMISSION

When individuals come into contact with an infected animal, such as a non-human primate, terrestrial rodent, antelope, gazelle, or tree squirrel, through actions like bites, scratches, hunting, skinning, trapping, cooking, or handling carcasses, there is a risk of contracting the disease. Consumption of inadequately cooked meat from infected animals can also lead to the transmission of the virus through ingestion. To reduce the likelihood of contracting monkeypox from animals, it is advisable to avoid unprotected contact with wild animals, particularly those that appear sick or dead, including monkeys. In regions where monkeypox is prevalent among animals, it is crucial to ensure that any food containing animal parts or meat is thoroughly cooked before consumption.

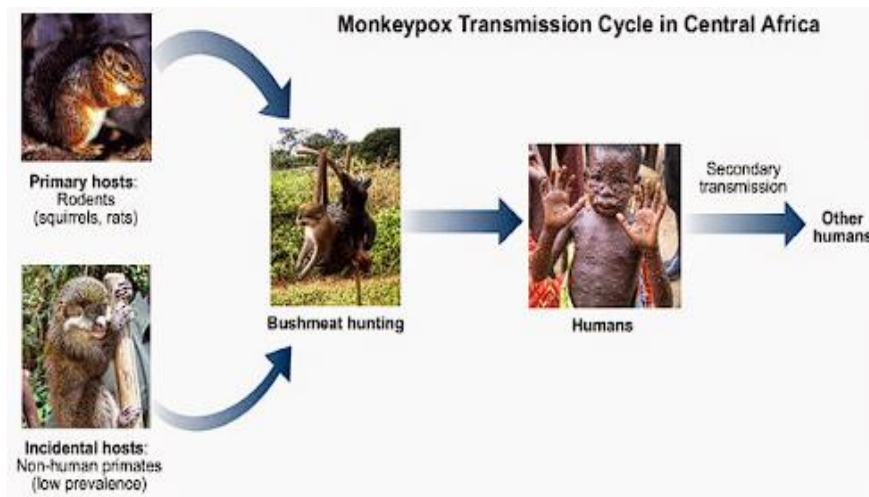
IS MONKEYPOX FATAL?

The less severe West African clade is causing the current world outbreak (2022). No one has died from this outbreak to date. But monkeypox can lead to other problems (complications) like pneumonia and infections in your brain (encephalitis) or eyes, which can be fatal.

PATHOPHYSIOLOGY OF MONKEYPOX

With the exception of the fact that the virus most likely enters the body through microscopic skin lesions or oral mucous membranes, the pathophysiology of monkeypox in humans is virtually the same as that of smallpox. Viral invasion may also occur through the respiratory system in exceedingly rare cases of transfer from one person to another.

Although monkeypox causes more lymphadenopathy than smallpox, it can also spread through lymphoid tissue. The virus first localizes in mononuclear phagocytic cells after being discharged into the bloodstream, and then it localizes again in skin cells. For more detailed information, please refer to the pathophysiology section of the smallpox virus.



The monkeypox orthopoxvirus is responsible for causing the disease. The lipoprotein layer has tubules or filaments that cover the viral DNA, and the viruses are oval brick-shaped. It is a zoonotic virus, and the main routes of transmission are thought to be direct contact with infected animals or, less likely, consumption of their undercooked flesh. In particular, when the skin barrier is weakened as a result of bites, scratches, or other trauma, vaccination may occur through cutaneous or mucosal sores on the animal.^[7]

PRECAUTION AND TREATMENT

How is monkeypox diagnosed?

Because monkeypox is rare, a healthcare provider may first suspect other rash illnesses, such as measles or chickenpox. But swollen lymph nodes usually distinguish monkeypox from other poxes.

To diagnose monkeypox, your healthcare provider takes a tissue sample from an open sore (lesion). Then, they send it to a lab for polymerase chain reaction (PCR) testing (genetic fingerprinting). You may also need to give a blood sample to check for the monkeypox virus or antibodies your immune system makes in defence of it.

In countries where animals carry monkeypox, protect yourself by avoiding unprotected contact with wild animals, especially those that are sick or dead (including their meat and blood). Any foods containing animal parts or meat should be cooked thoroughly before eating.

Reduce your risk of catching monkeypox from other people by limiting close contact with people who have suspected or confirmed monkeypox. Keep yourself informed about monkeypox in your area or social group and have open conversations with those you come into close contact (especially sexual contact) with about any symptoms you or they may have. Clean your hands frequently with soap and water or an alcohol-based hand rub.

Frequently clean and disinfect commonly touched surfaces in the environments that could have been contaminated with the virus from someone who is infectious. Common household disinfectants or bleach products are enough to kill the monkeypox virus.

If you think you might have monkeypox, you can act to protect others by seeking medical advice and isolating from others until you have been evaluated and tested. If you have probable or confirmed monkeypox, you should isolate from others until all of your sores have crusted over, the scabs have fallen off and a new layer of skin has formed underneath, and all the sores inside your body have also healed. This will stop you from passing on the virus to others. Get advice from your health worker on whether you should isolate at home or in a health facility. 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.

General precaution to protect monkeypox

A smallpox vaccine provides protection against monkeypox, but its use is currently limited to clinical trials. Prevention depends on decreasing human contact with infected animals and limiting person-to-person spread. The Bestway to help prevent the spread of monkeypox virus is to:

- Avoid contact with infected animals (especially sick or dead animals).
- Avoid contact with bedding and other materials contaminated with the virus.
- Thoroughly cook all foods that contain animal meat or parts.
- Wash your hands frequently with soap and water.
- Avoid contact with people who may be infected with the virus.
- Practice safe sex, including the use of condoms and dental dams.
- Wear a mask that covers your mouth and nose when around others.
- Clean and disinfect frequently touched surfaces.
- Use personal protective equipment (PPE) when caring for people infected with the virus.

MEDICAL TREATMENT

Diagnosis: Before the treatment of any disease that should be diagnosed properly for better selection of the treatment.

The monkeypox clinical presentation other rash illnesses like chickenpox, measles, bacterial skin infections, scabies, syphilis, and medication-related allergies must be taken into account during the clinical differential diagnosis. When an infection is in the prodromal stage, lymphadenopathy can tell monkeypox from chickenpox or smallpox. Tests for the virus can confirm the diagnosis.^[8]

The primary laboratory test is the polymerase chain reaction (PCR) analysis of samples from skin lesions. Because the virus only stays in the blood for a brief period of time, PCR blood tests are typically inconclusive. The onset dates of the fever, rash, specimen collection date, current stage of the rash, and patient age must be known in order to interpret test results.^[8]

Monkeypox is not the fetal condition but it may be complicated in several cases so many of the prevention and proper treatment is applicable. Generally, when the 5th stage of this virus has occurred in human body that is the complicated condition. So, patient can easily recover with self-medication and also can recommendation of medical practitioner or any prescriber.

If have monkeypox symptoms, there are over-the-counter medications that can help you feel better, including:

Pain relievers and fever reducers. Medicines like ibuprofen (Advil®, Motrin®) and acetaminophen (Tylenol®) can help you feel better.

Oatmeal baths. Soaking in a warm bath with colloidal oatmeal can relieve the dry, itchy feeling that comes with skin rashes.

Isolate yourself if you're infected. Avoid contact with others until all of your lesions have scabbed.

Cover single or local lesions. Use gauze or bandages to limit the spread to others and the environment.

Take good care. It's important to stay home and rest when you're sick, wear a mask around others and drink plenty of fluids.

Avoid contact with pets (especially rodents)

Currently, tecovirimat, cidofovir, and VIGIV are available from the Strategic National Stockpile under Expanded Access Investigational New Drug (EA-IND) protocols held by the Centers for Disease Control and Prevention (CDC) for treatment of OPXV infections in an outbreak scenario. In the United States, these medications can be accessed through the CDC via requests from state and territorial health departments. As of this writing, the CDC is developing EA-IND for use of Brin cidofovir for treatment of OPXV infections.^[9]

HERBAL REMEDIES BY PLANET AYURVEDA FOR MONKEYPOX

As examples of natural herb preparations offered by Planet Ayurveda are curcumin capsules and maha sudarshan kwath, which are made in accordance with traditional methods and effectively treat monkeypox, These formulations are extremely successful at promoting the patient's health and effectively managing the diseased state because they contain valuable ayurvedic herbs and are made strictly in accordance with the instructions provided in the samhitas (classical scriptures). The following is a list of the ayurvedic remedies for monkeypox that are effective.



1. PLANT CURCUMIN

Curcumin is a bright yellow chemical produced by plants of the *Curcuma longa* species. It is the principal curcuminoid of turmeric (*Curcuma longa*), a member of the ginger family, Zingiberaceae. It is sold as a herbal supplement, cosmetics ingredient, food flavoring, and food coloring.



Curcumin capsule

Curcumin capsules by planet ayurveda are prepared using natural extracts of a very beneficial ayurvedic component namely haridra (*Curcuma longa*). It contains numerous medicinal properties. Haridra helps to balance all the three dosha of the body. It is kushta hara (manages skin diseases), kandu hara (manages itching), and vrana hara (improves healing of wounds). Haridra is also useful in detoxifying the blood and contains anti-inflammatory properties. These medicinal properties will help to manage the condition of monkeypox effectively.

Dosage – One capsule two times a day, after meals.

2. Septrin tablet

Septin tablets prepared by Planet ayurveda contains natural extracts of various health benefiting ayurvedic components such as guggul (*Commiphora mukul*), tulsi (*Ocimum sanctum*), marich (*Piper nigrum*), etc. The combination of these herbs will help to fight off the disease-causing pathogens and establish the hindered equilibrium between the dosha, hence bringing back the healthy state. It promotes a healthy digestive system and a healthy respiratory system also. Hence, it helps to improve the overall condition of the patient with monkeypox.

Dosage – One tablet two times a day, after meals.

3. Maha sudarshan kwath

Maha sudarshan kwath is being prepared by planet ayurveda using beneficial extracts of various ayurvedic components such as amla (*Emblica officinalis*), haridra (*Curcuma longa*), pippali (*Piper longum*), shigru (*Moringa oleifera*), etc. These are presented in the form of decoction exhibiting numerous health benefits. It is beneficial in various acute and chronic fevers, weakness, reduced digestion, etc.

Dosage – Two teaspoon two times a day, after meals.

4. Gandhak Rasayan

Gandhak Rasayan is an Ayurvedic formulation presented by planet ayurveda. It is prepared using pure extract of a very beneficial ayurvedic component namely gandhak (Sulfur (purified)). It shows great results on the overall health of the

body. It helps to detoxify the blood of the body. It acts as an antibiotic and anti-inflammatory agent. Hence, will help to improve the condition of monkeypox. It is also beneficial in various other skin related disorders such as urticaria, acne etc.

Dosage – One tablet two times a day, after meals.^[10]

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