

Review Article - Human Monkeypox

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Abstract: *The root cause of monkeypox is comparable to smallpox and is caused by the monkeypox virus (MPXV). In 1971, the first case of monkeypox was documented in Western and Central Africa. An outbreak of monkeypox viruses occurred outside of Africa in 2003. The Centres for Disease Control and Prevention (CDC) and the World Health Organisation (WHO) state that direct contact with infected animals or people who have been exposed to infectious sores, scabs, or bodily fluids are the two ways that monkeypox is spread. Furthermore, this disease can spread by close contact between individuals during intercourse, kissing, snuggling, or touching specific body regions. Due to the various difficulties in using the smallpox vaccination to prevent monkeypox, antivirals such tecovirimat, brincidofovir, and cidofovir have been utilised..*

Keywords: monkeypox

I. INTRODUCTION

Definition and Classification:

Monkeypox is a viral disease caused by the Monkeypox virus (MPXV), a member of the Orthopoxvirus genus, which includes

1. Smallpox (Variola virus)
2. Cowpox (Cowpox virus)
3. Camelpox (Camelpox virus)
4. Vaccinia (Vaccinia virus).

The virus that causes mpox, also referred to as monkeypox, is a species of the genus Orthopoxvirus. Subclades Ia and Ib of clade I and subclades IIa and IIb of clade II are the two distinct clades into which the virus is classified. In 2022—2023, a worldwide outbreak of mpox caused by the clade IIb strain occurred. The recent increase in cases in the Democratic Republic of the Congo and other countries shows that clades Ia and Ib continue to pose a concern to public health.

Vaccines against mpox are available. Vaccination should be taken into consideration in addition to other public health initiatives. Typical symptoms of mpox include skin rash or mucosal lesions, which can last for two to four weeks. Fever, headache, back discomfort, aches in the muscles, low energy, and enlarged lymph nodes are some other symptoms. Intimate contact with an infected person, contaminated materials, or ill animals can all result in the transmission of mumps. The virus can infect the newborn either during or after delivery, as well as the fetus throughout pregnancy. For mpox symptoms including pain and fever, supportive care is given. Close attention is also paid to diet, hydration, skin care, preventing secondary infections, and treating co-infections, including HIV where it is present.

History and Discovery :

1. 1958: In Copenhagen, laboratory monkeys (*Macaca mulatta*) were the source of the virus's discovery by Danish researchers.
2. 1970: The Democratic Republic of the Congo (DRC) reported the first human case.
3. In the 1980s and 1990s, sporadic cases were documented in West and Central Africa

Virus Characteristics :

MPXV is a:



1. Double-stranded DNA virus
2. Large, complex virus (~300 kilobase pairs)
3. Enveloped virus with a lipid membrane
4. Contains two distinct genetic branches: Congo Basin and West African strains

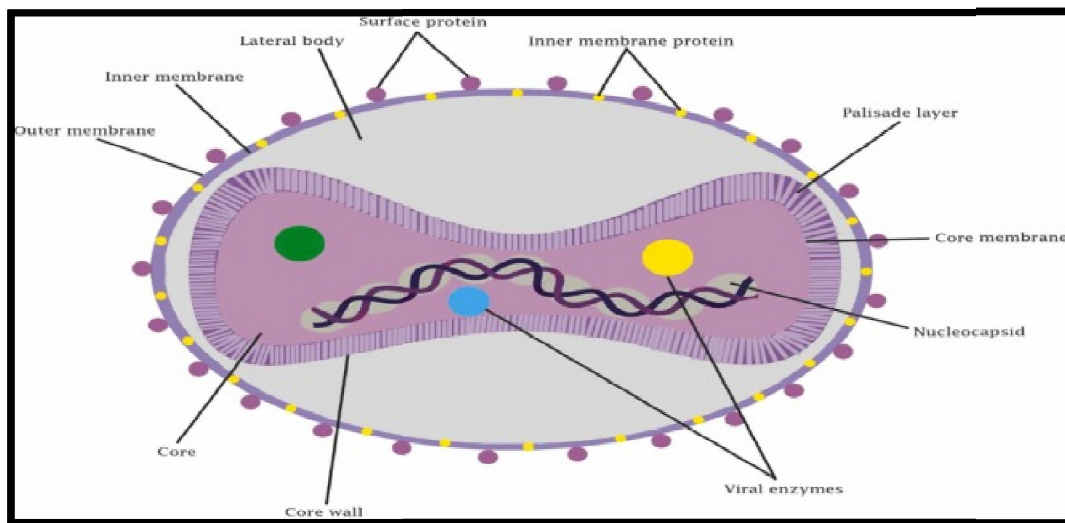


Fig 1. Structure of Monkeypox virus

Types of Monkeypox Virus :

There are two types of monkeypox virus, or clades, that cause the disease mpox:

- Clade I: More severe disease and death than Clade II are caused by this clade, which is typically found in Central Africa.
- Clade II : Typically found in West Africa, this lineage is responsible for less serious illnesses. The global mpox outbreak that started in 2022 was brought on by the clade IIb strain.

-Mpox is an uncommon illness that results in a rash and flu-like symptoms. The rash may resemble other viral diseases like hand, foot, and mouth disease, herpes simplex virus, or chickenpox.

-Intimate contact with an infected person or animal can spread the disease. Additionally, respiratory droplets and contact with contaminated things might spread it.

How Monkeypox Spread ?

Monkeypox (mpox) can spread through close contact with an infected person or animal, or by touching contaminated objects:

- Direct contact: Skin-to-skin contact, such as touching.
- Respiratory droplets: Prolonged face-to-face contact with someone who has mpox, such as talking or breathing close to them.
- Contaminated objects: Touching objects, fabrics, or surfaces that have been used by someone with monkeypox
- Animal-to-human: Bites, scratches, or contact with the feces of an infected animal.
- Pregnancy: A pregnant person can transmit the virus to their fetus.
- Needle injuries: Getting monkeypox through a needle injury in a health care setting or community setting.

To prevent the spread of mpox, you can clean and disinfect surfaces and objects, and wash your hands after touching surfaces that may be contaminated.



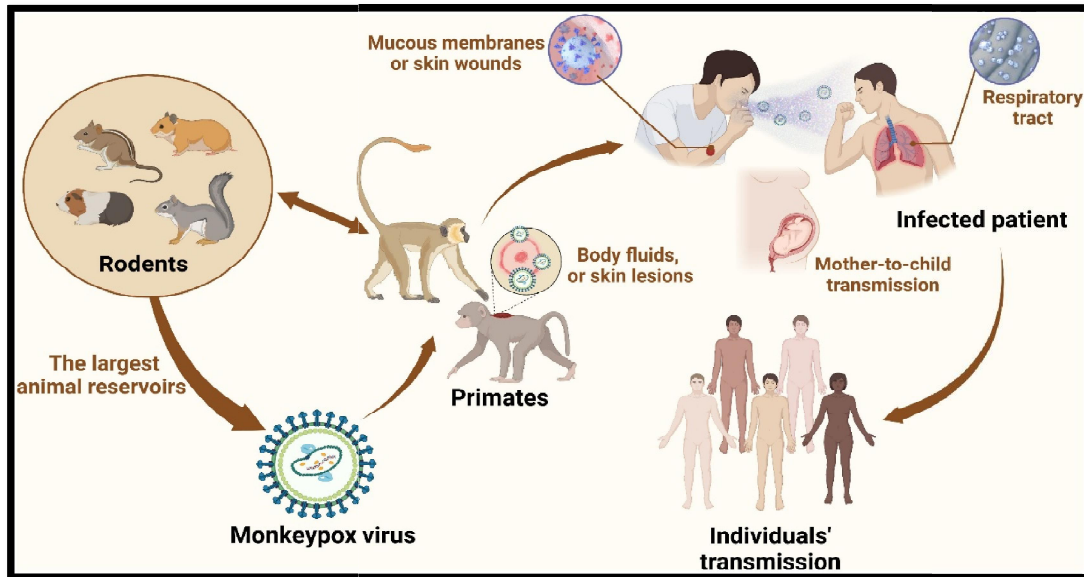


Fig 2: Overview of Monkeypox Transmission

Sign and Symptoms :

Initial Symptoms (days 0—5)

- Fever
- Headaches
- Pain in the muscles and joints (arthralgia, myalgia)
- Lymphadenopathy, or enlarged lymph nodes
- Exhaustion
- Sore throat

Lesions and Cough Rash (5—14 days)

- Blisters or rashes (usually beginning on the face and then spreading)
- Lesions may combine to form big blisters.

Additional Signs

- Colds
- Throwing up and nausea
- The diarrhoea
- Pain in the abdomen
- Eye infection, or conjunctivitis
- Inflamed tonsils
- Rarely, severe symptoms

Distress with breathing

Blood infection, or sepsis

Meningitis (brain lining inflammation)

Encephalitis (inflammatory brain disease)

Mortality (rate of 1—10%)





Fig 3: Sign and Symptoms of Monkeypox

2022-24 Monkeypox Outbreak – Global Trend

Weekly data updates from January 1, 2024, to September 29, 2024. Be aware that this data only contains cases that have been verified in a lab. Because there are reporting delays, care should be taken when interpreting the most recent weeks displayed in the epidemic curves.

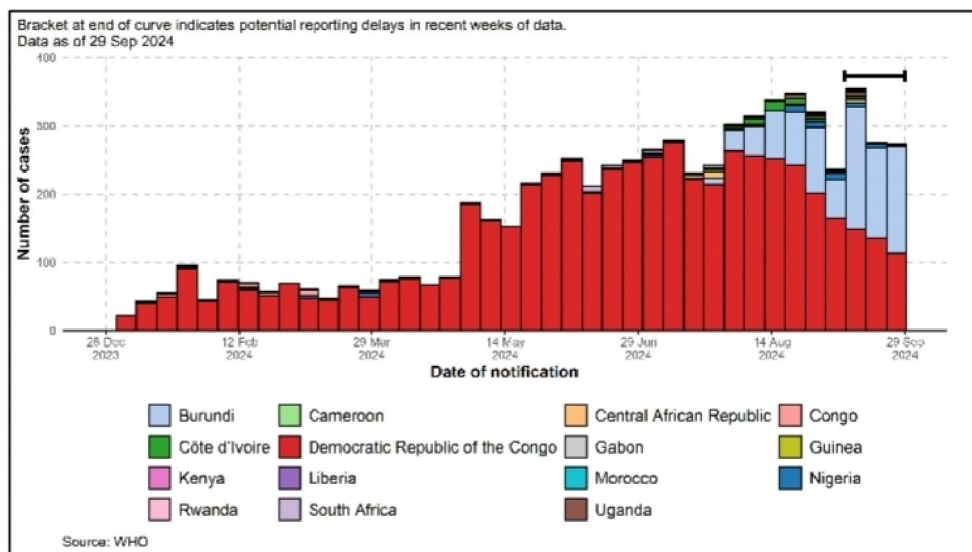


Fig.4 2022-24 Monkeypox Outbreak – Global Trend

The Information in this report is based on worldwide data surveillance data that was gathered starting on January 1, 2022, as a result of the unusual human-to-human transmission of the monkeypox virus.



Overview:

This report presents a monthly summary (as of August 2024) of the global mpox1 epidemiological situation and a weekly summary (as of 29 September 2024) of the situation in Africa.

Worldwide occurrence of rus (MPXV) in the same year.

The WHO Director General announced on August 14, 2024, that the rise in mpox cases in the International Concern (PHEIC) was in accordance with the International Health Regulations (2005). This spread poses a public health risk to the Democratic Republic of the Congo, and its spread to other nations creates a public health emergency that calls for a concerted international response.

According to information that is currently available, there are two primary reasons why mpox cases are spreading throughout the Democratic Republic of the Congo.

August 2024 saw the completion of the most recent global mpox fast risk assessment by WHO. Using the data at hand, the risk was evaluated as follows:

- High in the Democratic Republic of the Congo's east and its surrounding nations.
- High in Democratic Republic of the Congo regions where mpox is endemic.
- MPV is endemic in Nigeria and other West, Central, and East African nations: moderate.
- Moderate in all other African and international countries.

Treatment for Monkeypox Virus :

Although there isn't a single medication approved for treating monkeypox (mpox) in the US, there are a few approaches to manage symptoms and avoid complications:

Antivirals: People with severe smallpox symptoms or those at high risk of developing a serious illness may benefit from antivirals such tecovirimat (TPOXX) or brincidofovir (Tembexa), which are authorised for the treatment of smallpox.

Immunoglobulin from vaccination: This could be recommended by a medical practitioner to those who are not expected to respond to the vaccination. It has antibodies from recipients of the smallpox vaccination.

Supportive care: This can involve controlling skin damage, addressing discomfort, and maintaining a soft stool by consuming adequate fluids.

Isolation: Until your rash and scabs heal, keep yourself and your pets alone in a different room at home.

Fever reducers and pain relievers: These can improve your condition.

Baths with oatmeal: These can ease the itching, dry feelings that may accompany the rash.

Topical creams: Petroleum jelly or calamine lotion can relieve itching

Bedrest: You may need to rest, especially during the febrile stage of the illness.

Drugs that Used in tratment of Monkeypox virus :

There is no specific treatment approved for monkeypox, but some antiviral drugs may help:

The CDC advises using teirimcovat (TPOXX) as the first line of treatment for monkeypox, including in HIV-positive patients. On smallpox, the FDA has approved tecovirimat; however, there is a lack of safety or efficacy data on its usage in treating monkey pox.

Another antiviral medication called brincidofovir (Tembexa) may be used to treat monkeypox.

Another antiviral medication that might be used to treat monkeypox is cidofovir (Vistide).

An additional method of treating monkeypox is intravenous vaccination with vaccinia immune globulin (VIGIV).

If administered within two weeks after exposure, the smallpox vaccination, in conjunction to antiviral medications, may help lessen the severity of monkeypox. In this instance, the JYNNEOS vaccination is advised.

When you have monkeypox, you should stay away from your loved ones and pets in a different room at home until the rash and scabs go away.





Fig 5 Drugs that Used in tratment of Monkeypox virus

Test For Monkeypox virus :



The polymerase chain reaction (PCR) test, which looks for viral DNA, is the recommended laboratory test for monkeypox. Using pathogen-specific primers, genetic material is extracted from a patient samples and amplified for the test. The presence of the virus in the sample will be identified.

Here are some specifics regarding testing for monkeypox:

Sample gathering: Using a forceful swab, the best samples are extracted from the rash, including skin, fluid, or crusts. Swabs from the throat or anus can be obtained if there are no skin lesions.

Count of samples: In order to guarantee sufficient material for confirmatory testing, it is advised to get two samples from each patient.

Availability: Numerous sizable commercial laboratories as well as local, state, territorial, or tribal health authorities offer tests.

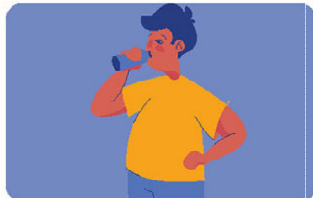
Blood samples: Since the virus only stays in the blood for a brief period of time during an infection, blood samples are not advised.

Self care from Monkeypox Disease



HOW TO TAKE CARE OF YOURSELF WHEN DIAGNOSED WITH MONKEYPOX (MPV)

These are recommendations. You should always talk to your provider for recommendations based on your case and symptoms.



Keep yourself hydrated.



Sanitize your hands.



Do your best to rest.



Avoid scratching and picking.



For MPV sores in throat, rinse with salt water 3 or 4 times a day and after eating.



Wash your skin with soap and water.



Take over the counter pain medication like Advil or Tylenol. Choose what works best for you.



Protect pox with gauze before putting on band-aids or covering.



Soaking can help relieve pain, especially after bowel movements.



For more information, visit [Michigan.gov/MPV](https://www.michigan.gov/MPV).

Courtesy of the Washington State Department of Health.

II. CONCLUSION

A new virus appears before the population has had time to recover from the impacts of the previous one. This is the situation with COVID-19 infection and monkeypox. The initial sequencing data from 15 isolates shows that the virus causing monkeypox is adapting to humans more quickly than expected because of larger-than-expected alterations in



the DNA genome. This highlights how vital it is to investigate therapeutic and preventative measures for the monkeypox outbreak. MSM make up the significant majority of patients, and HIV infection is more common among them. It has also been established that male gender poses a risk. The review advances knowledge of the clinicodemographic, therapeutic, and preventive facets of monkeypox. Understanding this will enable us to provide patients with better focused and well-organised care.

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