

CD Alert

National Centre for Disease Control,
Directorate General of Health Services, Government of India

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Monkeypox

INTRODUCTION

Monkeypox (MPX) is a viral zoonotic disease with symptoms like smallpox, with less clinical severity. MPX was first discovered in 1958 in colonies of monkeys kept for research, hence the name 'monkeypox.' It is a disease of global public health importance as it not only affects countries in West and Central Africa, but the rest of the world. The true burden of disease is not known.

HISTORICAL BACKGROUND

Monkeypox was first identified in humans in 1970 in the Democratic Republic of the Congo in a 9-year-old boy in a region where smallpox had been eliminated in 1968.

Since 1970, cases of monkeypox were reported in 11 African countries and in 2003, the first monkeypox outbreak outside of Africa was reported in the United States of America and was linked to contact with infected pet prairie dogs.

GLOBAL SCENARIO

According to World Health Organization (WHO), in the present series of outbreaks in Europe being reported, this is the first time that chains of transmission are without known epidemiological links to West or Central Africa. Monkeypox is a rare viral infection and has been reported as endemic in several central and western African countries such as: Benin, Cameroon, Central African Republic, Cote d'Ivoire, Democratic Republic of the Congo, Gabon, Liberia, Nigeria, Republic of the Congo, South Sudan and Sierra Leone. This has been also reported in certain non-endemic countries e.g. USA, UK Belgium, France, Germany, Italy, Spain,

Netherlands, Portugal, Sweden, Australia, Canada, Austria, Canary Islands, Israel and Switzerland. As on 25th July, India has reported four cases. Monkeypox has been declared as PHEIC by WHO on 23rd July'2022.

EPIDEMIOLOGY

Agent

Monkeypox virus (MPXV) is an enveloped double-stranded DNA virus that belongs to the genus Orthopoxvirus and family Poxviridae. There are two distinct genetic clades of the monkeypox virus – the Central African (Congo Basin) clade and the West African clade. The Congo Basin clade has historically caused more severe disease and was thought to be more transmissible. As per the recent literature, the latest strain of monkeypox virus is from West African clade and has about 50 genetic variations compared to related viruses that circulated in 2018-2019. The virus is continuing to evolve during the current outbreak, including several small changes in the genetic code, minor gene variants and a deleted gene.

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 infection of 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.

Mode of transmission:

- **Human-to-human transmission** is known to occur through large respiratory droplets generally requiring a prolonged close contact. It can also be transmitted through direct contact with body fluids or lesion material, and indirect contact with lesion material, such as through contaminated clothing or linens of an infected person. Transmission between sexual partners, due to intimate contact during sex with infectious skin lesions seems the more likely mode of transmission among men who have sex with men (MSM). The mode of transmission is evolving.

- **Animal-to-human transmission** of MPXV may occur by bite or scratch of infected animals like small mammals including rodents (rats, squirrels) and non-human primates (monkeys, apes) or through bush meat preparation.

CASE DEFINITION

Suspected case:

A person of any age having **history of travel to affected countries within last 21 days** presenting **with an unexplained acute rash AND** one or more of the following signs or symptoms

- Swollen lymph nodes
- Fever
- Headache
- Body aches
- profound weakness

Probable case:

A person meeting the case definition for a suspected case, clinically compatible illness and has an **epidemiological link** (face-to-face exposure, including health care workers without appropriate PPE; direct physical contact with skin or skin lesions, including sexual contact; or contact with contaminated materials such as clothing, bedding or utensils is suggestive of a strong epidemiological link).

Confirmed case:

A case which is laboratory confirmed for monkeypox virus (by detection of unique sequences of viral DNA either by **polymerase chain reaction (PCR) and/or sequencing**).

Surveillance Strategies

The aims of the proposed surveillance strategy are to rapidly identify cases and clusters of infections and the sources of infections as soon as possible to:

- ✓ isolate cases to prevent further transmission
- ✓ provide optimal clinical care
- ✓ identify and manage contacts
- ✓ protect frontline health workers
- ✓ effective control and preventive measures based on the identified routes of transmission.

Surveillance outline

- a) Use Standard Case Definitions by all District Surveillance Units (DSUs) under Integrated Disease Surveillance Programme (IDSP) and at Points of Entry (PoEs).
- b) Even one case of monkeypox is to be considered as an outbreak. A detailed investigation by the Rapid Response Teams need to be initiated through IDSP.
- c) Report any suspected case immediately to the DSU/State Surveillance Units (SSUs) and CSU (Central Surveillance Unit), which shall report the same to Dte. GHS MoHFW.
- d) Send the samples as per the guidelines to the designated laboratories.

Core Surveillance Strategy

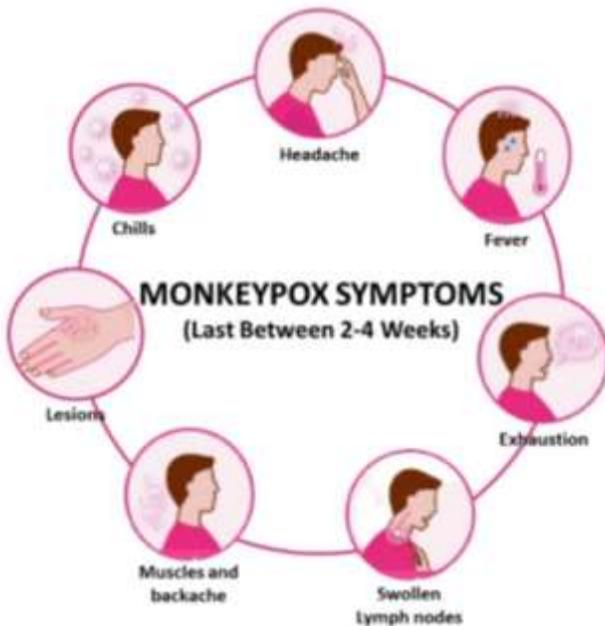
- a) **Hospital based Surveillance:** - Health facility-based surveillance & testing – in dermatology clinics, STI clinics, medicine, pediatrics OPDs etc.
- b) **Targeted Surveillance:** This can be achieved by:
 - Measles surveillance by Immunization division
 - Targeted intervention sites identified by NACO for MSM, FSW population
- c) Initiate contact tracing and testing of the symptomatic after the detection of the probable/confirmed case.

Reporting

Reporting of cases to be done in the specified format as per MoHFW Guidelines for Management of Monkeypox Disease.

CLINICAL FEATURES

Monkeypox is usually a self-limited disease with the symptoms lasting from 2 to 4 weeks. Severe cases occur more commonly among children and are related to the extent of virus exposure, patient health status and nature of complications. The extent to which asymptomatic infection occurs is unknown. Case fatality ratio of monkeypox has historically ranged from 0 to 11% in the general population and has been higher among young children. In recent times, the case fatality ratio has been around 3-6%.



Common symptoms and signs

Prodrome (0-5 days)

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

Skin involvement (rash)

- Usually begins within 1-3 days of fever onset, lasting for around 2-4 weeks
- Deep-seated, well-circumscribed and often develop umbilication
- 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 vesico-pustular.



Morphologic Appearance of Disseminated Lesions over Time

Source: <https://www.nejm.org/doi/full/10.1056/NEJMoa032299>

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. During the recent outbreak in the European Region, most of the cases have been picked up in sexual health clinics, with patients presenting with lesions on their genitals and anus.

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 monkeypox. At any one point in time pleomorphic forms can also be seen in a patient.

- e. The skin manifestation depends on vaccination status, age, nutritional status, associated HIV status. Monkeypox chiefly occurs in communities where there is often a high background prevalence of malnutrition, parasitic infections, and other significant health-compromising conditions, any of which could impact the prognosis of a patient with MPX.
- f. The total lesion burden at the apex of rash can be quite high (>500 lesions) or relatively slight (<25).

DIFFERENTIAL DIAGNOSIS

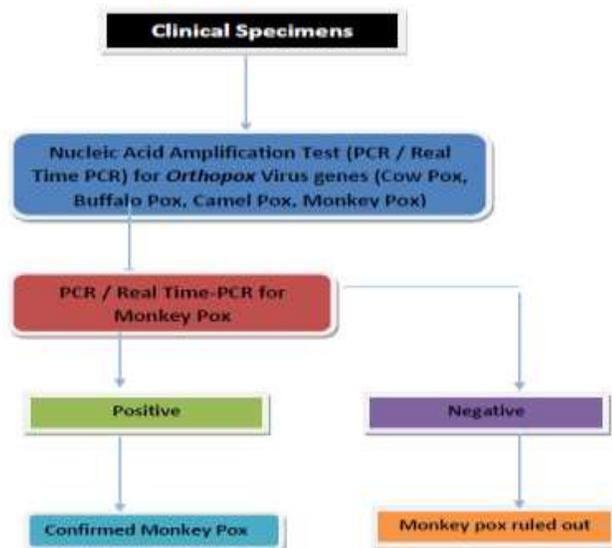
Varicella (Chicken pox), disseminated herpes zoster, disseminated herpes simplex, measles, chancroid, secondary syphilis, hand foot & mouth disease, infectious mononucleosis, molluscum contagiosum.

Complications

- Secondary infections
- Pneumonia, sepsis, encephalitis
- Corneal involvement (may lead to loss of vision)

DIAGNOSIS

Use Personal Protective Equipment for handling the clinical specimens. The recommended



Flowchart for Lab diagnosis of Monkeypox

specimen type for laboratory confirmation of monkeypox is skin lesion material from multiple sites, including swabs of lesion surface and/or exudate, roofs from more than one lesion, or lesion crusts. Oropharyngeal swab is recommended for diagnosis, if feasible, in addition to skin lesion material.

Detailed procedure for sample collection and transport of the clinical specimen are included in MoHFW Guidelines for management of Monkeypox Disease.

MANAGEMENT

Treatment of Monkeypox is primarily supportive.

Principles of Management include:

- Patient isolation
- Protection of compromised skin and mucous membranes
- Rehydration therapy and Nutritional support
- Symptom alleviation
- Monitoring and treatment of complications

Patient Isolation

- ✓ Isolation of the patient in an isolation room of the hospital/ at home in a separate room with separate ventilation
- ✓ Patient to wear a triple layer mask
- ✓ Skin lesions should be covered to the best extent possible (e.g. long sleeves, long pants) to minimize risk of contact with others
- ✓ Isolation to be continued until all lesions have resolved and scabs have completely fallen off

For details of supportive management of Monkeypox, refer to MoHFW Guidelines for Management of Monkeypox Disease.

CONTACT TRACING

Definition of a contact

A contact is defined as a person who, in the period beginning with the onset of the source case's first symptoms, and ending when all scabs have fallen off, has had one or more of the following exposures with a probable or confirmed case of monkeypox:

- ✓ face-to-face exposure (including health care workers without appropriate PPE)

- ✓ direct physical contact, including sexual contact
- ✓ contact with contaminated materials such as clothing or bedding

Contact identification

Cases can be prompted to identify contacts across household, workplace, school/nursery, sexual contacts, healthcare, houses of worship, transportation, sports, social gatherings, and any other recalled interactions.

Contact monitoring

Contacts should be monitored at least daily for the onset of signs/symptoms for a **period of 21 days** (as per case definition above) from the last contact with a patient or their contaminated materials during the infectious period. In case of occurrence of fever clinical/lab evaluation is warranted.

- a) Asymptomatic contacts should not donate blood, cells, tissue, organs or semen while they are under surveillance.
- b) Pre-school children may be excluded from day care, nursery, or other group settings.
- c) Health workers who have unprotected exposures to patients with monkeypox or possibly contaminated materials do not need to be excluded from work duty if asymptomatic but should undergo active surveillance for symptoms for 21 days.
- d) Advisory for International Passengers and surveillance at Airports and Role of APHOs/PHOs is elaborated in MoHFW Guidelines for Management of Monkeypox Disease.

PREVENTIVE MEASURES

Raising awareness of risk factors and educating people about the measures they can take to reduce exposure to the virus is the main prevention strategy for monkeypox. There are number of measures that can be taken to prevent infection with monkeypox virus:

- Avoid contact with any materials, such as

bedding, clothing etc. that has been in contact with a sick person.

- Isolate infected patients from others.
- Practice good hand hygiene after contact with infected animals or humans. For example, washing your hands with soap and water or using an alcohol-based hand sanitizer.
- Use appropriate personal protective equipment (PPE) when caring for patients.
- Correct containment and disposal of contaminated waste (e.g., dressings) in accordance with **Biomedical Waste Management guidelines** for infectious waste.

IPC at home

Patients who do not require hospitalization may be managed at home taking preventive measures as laid down in MoHFW Guidelines for Management of Monkeypox Disease.

Duration of Isolation Procedures

Affected individuals should avoid close contact with immunocompromised persons and pregnant women until all crusts are gone. Isolation precautions should be continued until **all lesions have resolved and a fresh layer of skin** has formed.

RISK COMMUNICATION

This includes providing public health advice through the channels that target audiences use on how the disease transmits, its symptoms, preventive measures and what to do in case of suspect or confirmed infection. This should be combined with targeting community engagement to the population groups who are most at risk, working closely with health care providers, including STD clinics, and civil society organizations.

Risk communication should be informed by insights from social listening detecting public sentiment and should timely address possible rumors and misinformation. Health information and advice should be provided avoiding any form of stigmatization of certain groups such as men who have sex with men (MSM).

VACCINATION

Vaccination against smallpox was demonstrated through several observational studies to be about 85% effective in preventing monkeypox. Based on currently assessed risks and benefits and regardless of vaccine supply, mass vaccination is not required nor recommended for monkeypox at this time.

CONCLUSION

Monkeypox is a rare viral zoonotic disease endemic in certain areas and now spreading to other non-endemic areas. The identification of confirmed and suspected cases of monkeypox with no direct travel links to an endemic area represents an unusual event making surveillance an important activity. Human-to-human spread of monkeypox can be controlled by public health measures including early case-finding, diagnosis and care, isolation and contact-tracing. Genomic sequencing, where available, may be undertaken to determine the monkeypox virus clade(s) in this outbreak. Government officials, researchers and workers across sectors at the local, national, regional and global levels should implement joint responses to such public health threats.

ACKNOWLEDGEMENT

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....about CD Alert

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