

Monkeypox- need for Vigilant Health system and Regulations towards a Global Health Threat

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Mpox, formerly known as monkeypox, is a viral infection caused by the monkeypox virus. It is a zoonotic disease that results in symptoms such as a painful rash, swollen lymph nodes, fever, headaches, muscle aches, back pain, and fatigue. The World Health Organization (WHO) reported that while most cases in 2022 were concentrated in Africa, the virus eventually spread to the USA, Europe, Australia, and Canada. Mpox remains a significant concern, with increasing cases in the Democratic Republic of the Congo and other African countries. From January 2022 to August 2024, over 120 countries reported more than 100,000 confirmed cases and over 220 deaths. [1] In India, the Ministry of Health and Family Welfare recorded 30 cases during the 2022 outbreak, with the last case reported in March 2024. [2]

The monkeypox virus was first identified in 1958 in Denmark among monkeys kept for research, and the first human case was documented in a nine-month-old boy in the Democratic Republic of the Congo in 1970. Mpox has progressively emerged in central, eastern, and western Africa, especially after smallpox was eradicated in 1980 and global smallpox vaccination programs ended. In 2003, the USA experienced an outbreak linked to imported wild animals. Since 2005, the Democratic Republic of the Congo has

reported thousands of cases annually. In May 2022, mpox outbreaks suddenly occurred and spread rapidly across Europe, the Americas, and all six WHO regions, including refugee camps in Sudan.

EPIDEMIOLOGY & MANAGEMENT

Mpox is caused by an enveloped double-stranded DNA virus belonging to the Orthopoxvirus genus, which has two clades: I (Ia and Ib) and II (IIa and IIb). The IIb clade has been responsible for outbreaks since 2022 and continues to spread beyond Africa, leading WHO to declare it a Public Health Emergency of International Concern. [3] Although the natural reservoir of the virus remains unknown, certain rodents (such as rope squirrels, tree squirrels, Gambian pouched rats, and dormice) and non-human primates are known carriers.

The virus typically incubates for 6 to 13 days but can range from 5 to 21 days, and it is contagious from 1-2 days before the rash appears until the scabs heal. [4] Mpox spreads primarily through close contact, including skin-to-skin contact, sexual contact, and mouth-to-mouth or mouth-to-skin interactions. Transmission can also occur through contaminated items like clothing and linens or needlestick injuries in healthcare settings.

Sexual partners of mpox patients are at higher risk, [3] and the virus can cause severe complications during pregnancy, potentially leading to miscarriage, stillbirth, neonatal death, or maternal health issues.

Animal-to-human transmission can occur during activities such as hunting, skinning, trapping, cooking, or handling animals. Clinically, mpox is generally self-limiting, with symptoms lasting 2 to 4 weeks. It often starts with fever, body pain, weakness, and swollen lymph nodes, followed by a rash that appears 3-4 days later, starting on the face and spreading to other parts of the body, including the palms, soles, and genital areas. The rash begins as flat sores, which then develop into blisters that crust over and fall off. Complications can include abscesses, pneumonia, sepsis, vision loss due to corneal infections, and severe conditions like encephalitis, myocarditis, and urethritis. The case-fatality rate ranges from 1-10%. [2][5]

Due to the limited availability of vaccines and treatments, preventive measures and public health education are critical in controlling mpox and preventing it from becoming a widespread pandemic. Public awareness campaigns are essential for early detection, prompt reporting to health authorities, and adherence to public health protocols. Preventive steps include isolation, frequent handwashing, wearing masks, covering lesions, avoiding shared items, and using personal protective equipment (PPE) when caring for patients. Health monitoring at international borders, including airports, seaports, and land crossings, is crucial for identifying and reporting suspected cases under the Integrated Disease Surveillance Programme (IDSP). The JYNNEOS vaccine, based on the Modified Vaccinia Ankara Bavarian Nordic (MVA-BN) virus strain, offers protection with a two-dose regimen that is 66%-89% effective. It is generally safe for most individuals except for pregnant women, lactating mothers, and young children. The vaccine can also be used post-exposure if administered within 4 days of contact with an infected person, and up to 14 days if symptoms have not developed. [6]

The One Health concept emphasizes the outcomes, responses, and actions at the

intersections of animals, humans, and ecosystems, with particular attention to emerging and endemic zoonotic diseases. The latter contributes significantly more to the disease burden in developing countries, having a substantial societal impact, especially in low-resource environments. Mpox as a disease, justifies the concept of One Health perfectly where its control and management require an integrated approach. Whether it is surveillance of animal or human populations, promoting proper hygiene of animal handlers, encouraging coordination between people of all sectors- doctors, veterinarians, environmentalists etc. [7]

Recommended public health actions include maintaining a high index of suspicion for individuals with unexplained rashes, recent travel to affected regions, or contact with confirmed or suspected mpox cases. Suspected cases should be isolated in designated healthcare facilities until all lesions have healed, or until a healthcare provider determines that isolation can be safely discontinued. Core Surveillance Strategies include Hospital-based Surveillance and Targeted Surveillance. Suspected cases should be reported to the District Surveillance Officer under the Integrated Disease Surveillance Programme. Even one monkeypox case is treated as an outbreak, triggering an investigation by Rapid Response Teams under IDSP. Laboratory testing involves collecting samples from lesions, blood, and other fluids for DNA-PCR testing at designated laboratories such as NIV Pune. If a case is confirmed, contact tracing should be initiated immediately. [8] Clinical diagnosis involves differentiating mpox rashes from other conditions like chickenpox and measles.

Treatment is primarily symptomatic, including saltwater rinses for oral sores, warm baths with baking soda or Epsom salts for skin lesions, and avoiding the popping or scratching of sores. Over-the-counter medications like paracetamol or ibuprofen can be used for pain management. Avoiding new sexual partners during high transmission periods can reduce the risk of contracting mpox. [9] The antiviral drug TPOXX contains tecovirimat, which is used to treat smallpox and has shown efficacy

against mpox. [10] Designated hospitals with nodal officers are equipped to manage mpox cases.

CONCLUSION

The re-emergence of mpox, especially in non-endemic areas, is a significant global health concern. This outbreak highlights the ongoing threat of zoonotic diseases, which are exacerbated by human encroachment into wildlife habitats. The current situation requires a coordinated international response, including enhanced disease surveillance, strengthened health systems, equitable access to diagnostics and treatments, and cross-border collaboration to prevent future outbreaks.

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