Review Article

Mpox: A Brief Review

Farzana Hoque, MD, MRCP (UK), FACP, FRCP

Associate Professor of Medicine, Saint Louis University School of Medicine, St. Louis, MO, USA

Corresponding author

Farzana Hoque, MD
E-mail: farzanahoquemd@gmail.com

Abstract

A global public health emergency due to the Mpox (monkeypox) epidemic was declared in July 2022 by the World Health Organization (WHO). Mpox is a double-stranded DNA Orthopoxvirus, belonging to the same family as the smallpox virus. Monkeypox name has been changed to "Mpox" to overcome social stigma and discrimination. Although Mpox cases have decreased since August 2022 in the USA, new cases, including clinically severe cases, continue to occur.[1]

This review summarizes the high-yield and up-to-date clinically relevant information on Mpox.

The Global Outbreak in 2022

As of May 2023, the CDC reported a total of 87,314 Mpox cases globally and 30,401 cases in the US.[1] Before 2022, community transmission of Mpox did not occur outside of Africa. Most cases occurred in the Democratic Republic of the Congo. In 2003, an outbreak of Mpox in Illinois, Indiana, Kansas, Missouri, Ohio, and Wisconsin, occurred due to contact with prairie dogs.[2,3] Most recent outbreaks in West and Central Africa have affected individuals of all ages, while previous outbreaks mainly affected children. 99% of U.S. Mpox cases occurred in men.[2,4] The most recent outbreak of Mpox predominantly affected gay, bisexual men, and men who have sex with men (GBMSM).[1,2]

Transmission

Mpox is a zoonotic infection. Despite the disease name, rodents are the primary animal reservoir.[3,4] Direct contact with animals' blood, body fluids, or mucosal lesions, transmit this disease. The intimate skin-to-skin or skin-to-mouth contact with an infected patient's lesions, and respiratory droplets through kissing or coughing can also cause human-to-human transmission of Mpox. Contact objects used by an infected person like clothing, bedding, or sex toys can spread this disease.[4,5,6] The 2022 worldwide epidemic of Mpox was mainly attributable to human transmission rather than direct contact with reservoir animals. Mpox has been detected in anorectal swabs from asymptomatic men who have sex with men (MSM).[5,6,7]

Clinical Features

Mpox usually takes between 3 to 17 days to manifest after exposure.[4,7,8] The illness typically lasts for 2-4 weeks, according to the CDC.[8] The most reported sign and symptom of Mpox is rash. The rash was most frequently reported on the genitals (46%).[2] These lesions are usually deep-seated, well-circumscribed, & often umbilicated.[4,7] Typically, the rash develops initially on the face, then on the palms & soles. The lesions evaluate through four stages – macular, papular, vesicular, and pustular before scabbing over & desquamation. These lesions are infectious until full healing with the formation of a fresh layer of skin.[4,7,8] Patients should receive health education and space to isolate themselves until all symptoms have resolved. Clinicians should test patients with a rash suspicious of Mpox, regardless of whether the rash is preceded by the prodrome or disseminated.[2] Lymphadenopathy is a key feature of Mpox and a distinguishing clinical feature from smallpox.[5,8] Inguinal lymphadenopathy is particularly prominent during this current outbreak.[4,7,8] Ocular Mpox can lead to blepharitis, conjunctivitis, keratitis, and loss of vision. Rectal pain and purulent or bloody stools have also been frequently reported.[4,5]

Risk Group

The illness severity can depend on the patient's initial health and exposure route.[7,8] Patients with HIV-associated immunosuppression, immunocompromised from other conditions & taking immunosuppressive drugs are at a high risk of severe Mpox.[9] Even HIV patients with no virologically suppression are at high risk of severe disease.[9] Children, particularly less than 8 years of age, pregnant or breastfeeding women are also at higher risk of severe disease. The co-infections with HIV, gonorrhea, syphilis, herpes, and chlamydia are frequently observed. It is crucially important to test for Mpox, HIV, & other sexually transmitted infections (STIs) in every sexually active person for whom Mpox is suspected.[4,9] Potential serious complications include encephalitis, secondary bacterial infections, septicemia, bronchopneumonia, and pneumonitis.[7,8]

Diagnostic Test

A definitive diagnosis can only be made when the clinical case definition has been met through confirmed laboratory testing. Nucleic acid amplification testing (NAAT), using real-time polymerase chain reaction (RT-PCR) or conventional PCR, is the preferred laboratory test. NAAT can be generic to Orthopoxvirus or specific to the Mpox virus (preferred). It is recommended to collect specimens from more than one lesion, including skin lesions, swabs of lesion exudate, roofs from more than one lesion, or lesion crusts. [10] Skin lesion swabs are the most effective means of detecting Mpox DNA by PCR. Aspiration or unroofing of lesions is not recommended due to the risk of sharp injury. In high-risk contacts of highly probable cases with systemic symptoms but without lesions, throat swabs are recommended to diagnose Mpox.[4] Any lab that performs tests for Mpox must report all results (positive, negative, equivocal) unless otherwise recommended by the applicable health department.[10] Positive test results must be reported within 24 hours of testing to the appropriate state, tribal, local, or territorial (STLT) health departments.[4,7,10] A positive test for Orthopoxvirus or Mpox virus DNA in a person without known risk factors or epidemiologic criteria needs to be verified by repeat testing. The other possible causes of rash also need evaluation.

Treatment

Mpox is a self-limited illness and does not require antiviral treatment for most patients with intact immunity. The antiviral tecovirimat is currently used to treat patients with severe Mpox disease or who are at high risk of severe diseases like severe immunocompromised patients.[4,8] Patients need to be counseled to take fatty meals with oral tecovirimat to ensure adequate gastrointestinal absorption to maximize serum drug levels.[11] Those at high risk of severe disease, such as severely immunocompromised patients may need a longer course of tecovirimat than its standard 14-day course until their immune system can effectively clear Mpox.[10,11] For most patients treatment with tecovirimat alone is sufficient. However, patients who experience persistent or newly emergent Mpox lesions after 14 days of tecovirimat treatment should undergo lesion swab specimens for tecovirimat resistance and plasma pharmacokinetic testing.[11] It is important to note that the pharmacokinetic test is conducted by a designated lab, not at the CDC.[11] CDC's Health Update stated in November 2022 that tecovirimat resistance is rare and has been associated with prolonged administration and severe clinical outcomes.[11]

Vaccination

Although two types of vaccines, JYNNEOS & ACAM2000 are available, JYNNEOS is the primary vaccine to prevent Mpox disease in the USA.[12] Per the CDC, unvaccinated people had 14 times the risk of Mpox compared to those who have received their first dose.[13] The vaccination within 4 days following exposure can prevent the onset of Mpox. CDC advises that if the vaccine is given between 4 to 14 days after the exposure, vaccination may reduce the severity of the disease, not the disease onset and it should be offered. JYNNEOS vaccine is administered as a series of two doses, with a 28-day interval between them. It is expected to achieve peak immunity 14 days after the 2nd dose of the JYNNEOS vaccine. In contrast, a single dose of ACAM2000 is

administered, and peak immunity is expected to be reached 4 weeks after that one dose administration.[12] JYNNEOS is currently recommended as safe for immunocompromised patients including HIV, and patients on immunosuppressive drugs.[9] Conversely, ACAM2000 is contraindicated in immunocompromised patients. [11,12]

Conclusion

Early treatment with available therapies for patients at risk for severe Mpox, particularly AIDS patients, is crucial.[9] The JYNNEOS vaccine has been shown to protect against Mpox, based on the currently available evidence.[12] Although further study is needed to determine the magnitude and durability of protection, CDC advised completing the 2-dose vaccination series for vaccine-eligible persons.[12] Health education aimed at avoiding behaviors that can lead to Mpox will reduce the stigma around our LGBTQ+ community.

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