

India's Monkey Pox Outbreak 2022

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Abstract

Monkey pox is a viral zoonotic disease caused by the monkey pox virus in the orthopox genus and family Poxviridae. The major reservoirs of this disease are wild animals. Previously, it was limited to certain endemic countries. But the ongoing outbreak was started by a British resident in the United Kingdom on May 6th, 2022. After that, many cases have been reported in different non-endemic countries, including India in July 2022. The clinical manifestations include fever, lymphadenopathy, along with skin lesions varying from rashes to macules, papules, vesicles, and crusts. It needs to be differentially diagnosed from small pox, which usually causes similar lesions. The definitive diagnosis can be made via polymerase chain reaction. There is no specific treatment or vaccination for monkey pox. The preventive measures that need to be taken include reducing the ecological disruption caused by humans and taking precautionary measures against risk group people (healthcare workers).

Background And Timeline

Monkey pox, a viral anthroponozoonosis (transmitted to humans from animals), is caused by monkey pox virus, which belongs to the genus *Orthopox* virus of the family *Poxviridae*. There are two distinct hereditary subgroups (clades) of monkey pox virus, i.e., the central African and the west African clade. The ongoing 2022 India outbreak is caused by a West African clade of human monkey pox virus [1, 2]. The term monkeypox was given as it was first isolated from the monkeys who were transported from Singapore to Denmark for laboratory research purposes in 1958 [3].

The first human monkey pox cases were reported in unvaccinated children from the Democratic Republic of Congo in 1970 during small pox eradication programmes [4]. Since the 1970s, it has been reported in various African countries and outside Africa. The ongoing outbreak was first confirmed by a British resident on May 6, 2022, who had travelled from Nigeria (an endemic country) [5]. After that, on May 22, 2022, various non-endemic countries were affected by this virus, and on July 23, 2022, the World



Health Organization declared it as a Public Health Emergency of International Concern [6]. In India, the first suspected monkeypox case was reported from Kerala on July 14th, 2022, and it was later confirmed by the National Institute of Virology (NIV), Pune [7]. Then, on July 31st, 2022, a 22-year-old man who returned to Kerala from the United Arab Emirates died due to the monkey pox virus [8]. After that, various cases have been reported from the national capital as well. India was the tenth country in Asia and the first in South Asia with reported monkey pox cases. Currently, the Indian Council of Medical Research (ICMR) and Viral Research and Diagnostic Laboratory (VRDL) are using preliminary RT-PCR tests for diagnosis, which are further routinely confirmed by NIV, Pune [6].

Transmission

As the nature of the disease is anthroponosis, it can be transmitted via bite/scratch by an infected animal or via contact with an infected animal's fluids through mucus membrane or abraded skin [9]. Also, there exists a human-to-human transmission that spreads via direct or indirect contact with an infected person's body fluids, air droplets, or contaminated bedding. The sexual mode of transmission of the disease is speculative [10, 11].

Clinical Manifestations

The incubation period of the disease varies from five days to three weeks, with the duration of symptoms ranging from two to five weeks [12]. The disease is more pronounced in the young and elderly, as well as immune-compromised patients [13]. The most common initial clinical manifestations are fever, fatigue, headache, myalgia, and lymphadenopathy [1, 6]. After five days following the onset of fever, different sized rashes start developing on the face, trunk, palm, and soles of the feet. The lesions progress from rashes to macules, papules, vesicles, and exanthema, which then progress to scabs/crusts and marks during the healing phase (Figure 1) [12]. These lesions make this disease difficult to differentiate from small pox. However, the presence of marked lymphadenopathy (in the neck, groin, and submandibular area) prior to the onset of rashes, combined with its lower severity compared to small pox, distinguishes it as a distinguishing feature for the diagnosis of human monkey pox [1, 12]. Congenital birth defects can develop if infection occurs in pregnant women [14]. Also, various species of animals like tree squirrels, non-human primates, and dormice have also been reported to be infected with this disease. The clinical signs among the animals vary, and transmission occurs via direct or indirect routes [15].





Figure1: Stages of lesion development (Source: Centre for Disease Control and Prevention)

Diagnosis

First, a detailed medical history should be taken, with special attention paid to the travel history, vaccination history, date of onset of fever, onset of rashes, and specimen collection date [1, 6]. The gold standard test for diagnosing monkey pox is polymerase chain reaction (PCR). Various immunological methods are also in current use, which involve detection of IgG and IgM antibodies against monkey pox virus. The only limitation of these techniques is the costly equipment and lack of proper facilities in low-income countries [1].

Treatment

There is currently no specific treatment or vaccination for monkeypox viral disease. Tecovirimat, an antiviral drug, is being used in the United States and European Union for the treatment of monkey pox. WHO has recommended tecovirimat or brincidofovir (smallpox treatment) as the first line antiviral therapy along with other supportive therapy [16]. Also, the Centre for Disease Control and Prevention (CDC) recommends the small pox vaccination within four days of exposure to infection, which can prevent the disease and can reduce the severity of the disease when injected within two weeks of exposure [1].

Prevention

The WHO and CDC have given the status of an emergent disease to the monkey pox. The major work for prevention needs to be done at the ecological and risk group fronts. As the major reservoirs of the disease are wild animals, As a result, people's reliance on wild hosts (rodents) for protein-rich diets must be shifted to vegetarian and other protein sources, while also preventing reservoir animal displacement by limiting urban expansion into reclaimed forests [17]. The other front is preventing



exposure to risk groups, which can be accomplished through small pox vaccinations, proper precautions taken by health care professionals (including the use of personal protective equipment), and the isolation of affected patients in negative pressure rooms [1, 12].

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