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Monkeypox: Next Global Health Emergency Hitting India in 2022

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Abstract

Monkeypox disease which is catalyzed by the zoonotic orthopox monkeypox virus is taking shape in the form of novel threat to the human lives not only in India but also worldwide creating a sense of fear and panic and gaining attention globally after the severe acute respiratory syndrome coronavirus 2 (coronavirus disease 2019) pandemic. The present research article discusses about the current scenario and preparedness in India after the first case of the monkeypox disease that has hit the country and what are the master plans that the country should follow in the future to cease the virus transmission.

Keywords: India, Monkeypox, Outbreak, World Health Organization

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Introduction

As India is still combating coronavirus disease 2019 (COVID-19) pandemic caused by severe acute respiratory syndrome coronavirus 2, another infectious disease, monkeypox, caused by the monkeypox virus (MPXV) is expanding its horizon beyond imagination gaining attention not only in the country but also on an international level. Monkeypox is not a brand new disease but a once - disregarded zoonotic virus endemic to West and Central Africa.[1-3] The first case was detected as early as in 1958 in non-human primates kept for research in Denmark,[4,5] while the first case in humans was identified in the year 1970 in a child in the Democratic Republic of the Congo.[6] Initially, it was associated to occurrences in the West that had a clear-cut history of travel to endemic African countries but the recent multi-country outbreak with human-to-human transmission, absence of travel record in the past, and a dearth of contact with travelers or animals from endemic countries is causing great perturbation among global health bodies. Since the beginning of May 2022, instances of monkeypox have been delineated from non-endemic countries and continue to be reported from endemic nations.[7] The very first monkeypox case confirmed in the country in Kerala in a 35-year-old male and a native of Kollam district who had arrived in the State from the United Nations Emirates on July 12.[8] The World Health Organization is fairly deciding whether to proclaim monkeypox as public health emergency of international concern.[9]

Etiology and Pathogenesis

Having the linear double-stranded DNA genome, MPXV has a broad spectrum of potential host organisms – monkeys, rodents, squirrels, etc., and the disease is transmitted enterally through eating improperly cooked meat and parenterally through contact with or bites of animals, blood, and body fluids secretion, mainly from the respiratory tract or skin.[10] Transmission can also escalate through contaminated articles such as linens, bedding, gadgets, and clothing having infectious particles.[11]

Clinical Features

People strike by this disease get a rash that may be situated on or near the genitals (penis, testicles, labia, and vagina) or anus and can be on other areas such as the hands, feet, chest, face, or mouth and the rash will follow different phases before juncture of healing.[12] It ordinarily presents with fever, rash, and swollen lymph nodes. The incubation interval is usually from 6 to 13 days but can extend up to 21 days. The infection can be divided into two spans: invasion and skin eruption.[12] The former lasts from 0 to 5 days and is characterized by fever, intense headache, lymphadenopathy (swelling of the lymph nodes), back pain, myalgia, and intense asthenia while the latter usually begins within 1–3 days of the appearance of fever. The rashes are usually more condensed on the face and extremities rather than on the trunk affecting the face (in 95% of cases) and palms of the hands and soles of the feet (in 75% of cases). Oral mucous membranes (in 70% of cases), genitalia (30%), and conjunctivae (20%) are also affected along with the cornea. The rash evolves consecutively from macules (lesions with a flat base) to papules (slightly raised firm lesions), vesicles (lesions filled with clear fluid), pustules (lesions filled with yellowish fluid), and crusts that descend after drying. The number of lesions varies from a few to several thousand. In severe cases, lesions can mingle until sizeable sections of skin get toss [Figures 1 and 2].

Diagnosis

Acknowledging the clinical presentation and having a pointer of inkling is crucial for identifying potential cases. The clinical differential diagnosis that encompasses other rash illnesses, such as chickenpox, measles, bacterial skin infections, scabies, syphilis,

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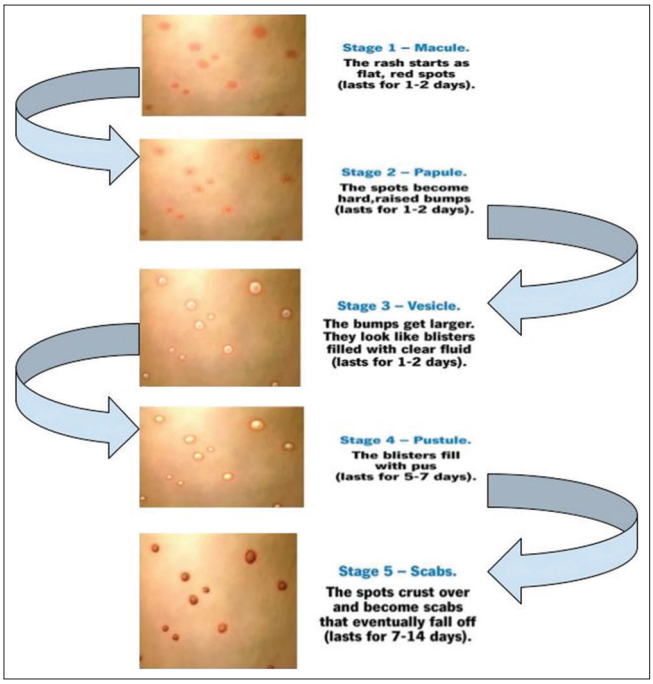

Figure 1: Illustration of the various clinical stages of the monkeypox disease

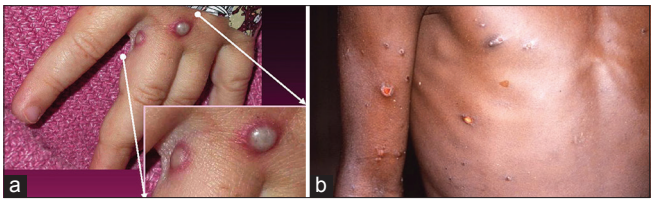

Figure 2: (a and b) Clinical images of patients affected by the monkeypox virus (*Source: Google images*)

and medication-associated allergies, should be considered for making an accurate diagnosis of the monkeypox disease. Contact scrutinizing is very important to cease the viral transmission thereby checking the disease. The travel history of the suspected individuals should be taken. Polymerase chain reaction is the preferred laboratory test given its accuracy and sensitivity having optimal diagnostic samples for monkeypox is from skin lesions – the roof or fluid from vesicles and pustules, and dry crusts.[13] Serology and antigen detection methods are not advised because orthopox viruses are serologically cross-reactive. Cell culture can be performed that can provides virus strains.

Management

At present, there are no US Food and Drug Administration-approved treatments specifically for monkeypox. The treatment includes primarily supportive but antiviral agents and immune therapies are also been given to the patients. The bioavailable drugs that are used against the virus are cidofovir, brincidofovir, and tecovirimat [Figure 3]. There are no vaccines specifically designed to protect against MPXV infection but vaccinia immune globulin intravenous (vaccinia virus-based vaccines) is contemplated to be used for post-exposure prophylaxis, which was developed for the smallpox virus.[14]

Cidofovir

- 5mg/kg per dose once weekly for >= 2 doses
- Can be given iv, off-label, topical, intravesicular

Brincidofovir

- 4mg/kg once weekly for 2 doses
- Given orally

Tecovirimat

iv - 35 to <120 kg: 200mg q12 hrs for 14 days
>=120 kg: 300 mg q12 hrs for 14 days
Oral- 40 to <120 kg: 600mg q12 hrs for 14 days
>=120 kg: 600mg q8 hrs for 14 days

Figure 3: Depicting the doses of the available drugs for the treatment of the monkeypox disease

Conclusion

The continuing global outbreak of the monkeypox disease is one of the largest in history, with chains of transmission chains occurring in multiple countries including India which is already struggling with the devastations of the COVID-19 pandemic. The key to utilize the available tools to control the monkeypox disease and stop its further spread in the country will be best achieved by defining the characteristics of the present outbreak. We have to implement the screening tools in health-care settings and maintaining a high level of suspicion using emerging clinical case definitions to identify cases and delineate the scope of the outbreak. There is a need for early-stage isolation of suspected and confirmed cases and their close monitoring and vaccinating their close contacts and health-care professionals who are at high-risk exposures discontinuing the chain of transmission of the virus.

The country needs to map out some guidelines for the prevention and control of this contagious disease. The researchers need to strengthen the vaccine production capacity that would be an essential strategy. A separate economy planning should also be done by the government of India. Using public health measures and ensuring health tools that are available to at-risk populations are of utmost importance. It is also important to work with coteries to ensure that people who are most at risk, have the information, and support they need to protect themselves and their near ones.

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