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Popular Article

Monkeypox: Present-day Scenario in India

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Abstract:

An orthopox virus known as monkeypox has been reported to be spreading around the planet in 2022. In India and several other emerging nations, a major epidemic has not yet happened. Our goal with this study is to raise awareness of epidemiological, diagnostic, and infrastructural difficulties among health care workers, particularly paramedical staff. The most common way that this disease manifests typically cutaneous; nevertheless, multiorgan involvement which is frequently disregarded can result in morbidity and death. We have discussed vaccination as a preventative measure, a therapy option, and a differential diagnosis. We have also provided recommendations about the provision of training to non-medical workers in the event of an epidemic, including the field diagnosis, workup, and monitoring of confirmed cases both at home and at a medical facility. This might be very helpful in establishing an early diagnosis, adopting the proper contact precautions, and recommendations and prudent resource management.

Keywords: Vaccine, Preventive, Antiviral, Monkeypox

Introduction:

Amidst the disorderly waves and aftermath of the COVID-19 pandemic, a new viral epidemic known as "monkeypox" surfaced globally in early May 2022 (Ladnyj *et al*., 1972). Related to the smallpox virus, the monkeypox virus was initially characterized in human beings in the 1970s and had been intermittent and endemic in several African regions. August 2022 will see the World Health Organization proclaimed it as a Public Health Emergency of International Concern (Philpott *et al*., 2022). Why then is there a monkeypox outbreak at this time? A shift in human behaviour brought about by the easing of coronavirus protection measures, the return of international travel, widespread events and a rise in homosexual activity. Add-on triggers for the monkeypox outbreak include a likely shift in the biological makeup of the virus and weakened immunity to the smallpox virus (WHO, 2023). India reported the first two cases of monkeypox in the 2nd week of July 2022 in Kerala, and both these patients had arrived from the Middle East. The first reported monkeypox death on July 30, 2022, in India, was of a 22-year-old male from Kerala. Keeping in mind the rising toll of monkeypox cases in India, this article has been written with an

attempt to shed light on the important aspects of the disease (Yadav *et al*., 2022).

Two other genetic groupings of the monkeypox virus are the West African (WA) clade and the Congo Basin (CB) clade, which is sometimes referred to as the Central Africa clade. The CB clade has been discovered from Central and Southern Cameroon to the Democratic Republic of the Congo, whilst the WA clade has been traced from Western Cameroon to Sierra Leone. With incredibly high rates of interhuman transmission, serial transmission events, and secondary attack rates, the CB clade is believed to be more virulent than the WA clade, which is considered to be the gentler group. When a patient contracts the monkeypox virus, their immune system mounts cellular and humoral defences that prevent the virus from replicating and provide them with long-term protection. Following a spontaneous monkeypox infection, the body develops long-lasting residual IgG-memory B cells that protect against re-infection or the onset of severe illness, as well as orthopoxvirus-specific IgM and IgG antibodies against a range of antigen targets (William and Madan, 2023).

Epidemiology:

Magnus *et al*. (1959) identified the monkeypox virus as the causative agent of monkey pox in monkeys (Huang *et al*., 2022). On September 1, 1970, a similar virus was isolated from a male child in the Democratic Republic of the Congo who was afflicted with a pox infection. The child had fever and haemorrhagic lesions in a centrifugal pattern, resembling smallpox. It was then noted that the village's residents had either received a smallpox vaccination or had pock marks from a previous smallpox infection, suggesting that the patients had managed to avoid the new pox infection that the child had. More than 400 cases of monkeypox were reported between 1970 and 1990, and more than 500 cases were reported between 1990 and 2004 in Africa. However, the first outbreak of the infection in approximately 40 people was observed outside of Africa in 2003 in the United States. As of November 17, 2022, the number of laboratory-confirmed cases of monkeypox was 80,249, and 53 deaths had been reported to the World Health Organization from over 106 countries in the WHO regions. The illness has an approximate 17-day incubation period and its systemic symptoms, which typically last 1–5 days, include fever, myalgia, headache, and sore throat (Reed *et al*., 2004; Reynolds *et al*., 2007).

Transmission:

- **Animal to human:** Animal bites or bodily fluids can transmit monkeypox to humans. Reports of animals include monkeys, rats, and squirrels. Direct human-to-human contact can result in contact, respiratory secretions, and fomites.
- **Horizontal transmission** is known to happen as well. Gays and lesbians are at an increased chance of dissemination.
- **Transmission in a vertical** direction can cause congenital monkeypox (Thornhill *et al*., 2022).

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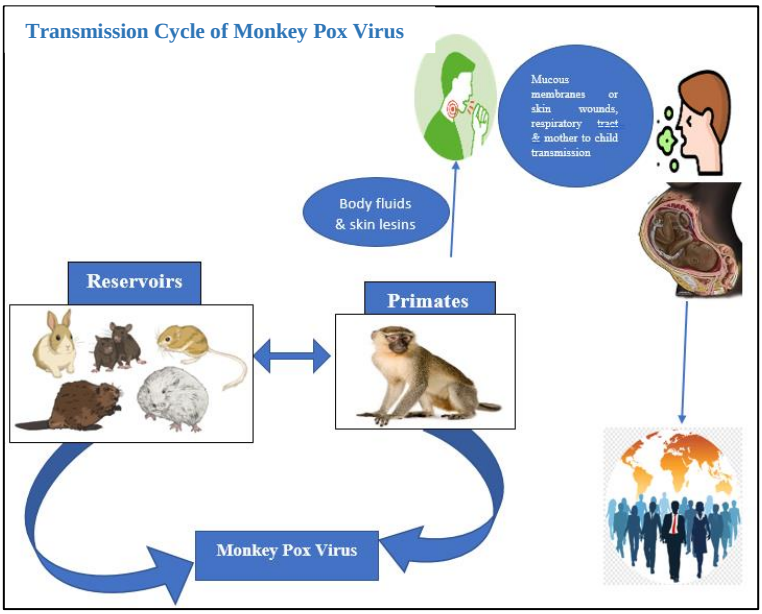
Symptoms:



- It primarily affects the genital region, with single or multiple lesions over the penis, scrotum, and pubis. Mucosal lesions are also known to occur; the rashes may start from the site of inoculation and spread.
- **Appearance**: It starts as macules and progresses to papules, vesicles, and pseudo-pustules. Occasionally, central umbilication may be noted. Crusting occurs 1-2 weeks after the rash onset.
- **Location**: It is primarily affected in the genital region and oral mucosa. There were cases that presented with both tonsillitis and proctitis during the most recent outbreak. In those cases, there were visible lesions on the tonsils/pharynx, but among those presenting with proctitis, there may not be any visible local lesions and they only present with pain and discharge/bleed from the anorectal region (Iñigo Martínez *et al*., 2022).
- The current outbreak's clinical characteristics differ in several respects from those of the earlier epidemics. Lesions are less frequent and more prevalent in the current pandemic across mucosal surfaces, in contrast to earlier epidemics where the hands and face were primarily affected by lesions. There should be a strong suspicion of monkeypox among individuals who have cutaneous lesions in addition to other risk elements including departure from endemic areas (Africa), interaction history (including kindergarten, contact sports, and sexual encounter) (Patel *et al*., 2022).

Treatment:

- Treatment for moderate instances is conservative, including of analgesics and enough water.
- It is advised to use antiviral medications for mild to severe instances. They work best when started early on.
- Tecovirimat a first-line antiviral medication. It is a substance that inhibits the orthopox virus VP37 protein eventually produced the inhibition of the virions' development, which is what causes the spread of the infection. It can be taken orally as a precursor to Off-label usage at 600 mg twice day and 200 mg intravenously twice day every day for a duration of 14 days.
- In the event of ocular involvement, topical medicines trifluridine and vidarabine, which are inhibitors of viral DNA synthesis, can be used as drops or ointment.
- Keeping an eye out for warning flags is crucial when treating patients conservatively or with antiviral medications.

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- Pregnant women and those with impaired immune systems are the patient groups that need to be watched. It is also necessary to educate patients who are not in a healthcare environment about warning signs so they can visit a nearby healthcare facility as soon as possible (Krishnan et al., 2023).

Diagnosis:

The primary clinical hallmark is the presence of cutaneous lesions, which may be typical. Nevertheless, genital lesions might not be very distinctive, and they might coexist with other genital tract abnormalities, muddle the clinical image. This may be connected to excruciating systemic symptoms and lymphadenopathy. A definitive diagnosis can be made using PCR and serology. Those who have had prior vaccinations may have positive serology results.

In the first stages of the illness, serology would be negative, approximately five days pass before immunoglobulin. It takes eight days for IgG to be positive and M (IgM) to be positive. PCR analysis to detect orthopox virus serology is not favoured over DNA, as it is more precise. It is advised to take two swabs from distinct lesions. It is important to remember that testing for monkeypox should be done even if testing for other illnesses has come back positive. Monkeypox coinfection can occur with varicella, syphilis, HIV, etc. favourable. Taking into account the common clinical presentations, it is to note that there are circumstances in which occurrences of monkeypox can be absent. Certain instances could have prominent mucosal lesions and fewer skin lesions, particularly in the context of the current outbreak (Karem *et al*., 2005).

Prevention:

Currently, there are two vaccinations for monkeypox: ACAM2000 and Modified Vaccinia Ankara (MVA).

1. The vaccinia virus has been attenuated to create MVA. Originally, it was designed to treat smallpox, however it was recently authorized for monkeypox as well. It is administered in two doses separated by four weeks. 0.5 mL subcutaneous or 0.1 mL intradermal.

2. ACAM2000 is a live-attenuated virus as well. ACAM2000 is connected to additional negative consequences including fever, eczema, myocarditis, and localized responses, such as lymphadenopathy. ACAM2000 is a single dose.

Vaccines can be given pre-exposure if at risk and as post-exposure prophylaxis. Post-exposure administration may be beneficial in reducing the severity of illness. Post-exposure prophylaxis can be considered for those with high-risk exposure. It was discovered that doing this lessened the chance of an epidemic and the severity of the sickness. In terms of effectiveness, a phase 3 experiment that was released in 2019 states that seroconversion rates (about 90%) across the two groups were comparable with greater unfavourable incidents in the group ACAM2000. The primary focus of this investigation was intended to protect against smallpox (Petersen *et al*., 2015).

Challenges in India:

In the event of an outbreak, India and other developing nations would face a number of challenges, from a lack of infrastructure and labour to the financial strain that a widespread outbreak would place on the already overburdened system. Potential challenges would arise in the areas of screening, immunization, and

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management. Nevertheless, there are several things we can do to lessen the impact of a potential outbreak, including leveraging the knowledge and experience gained from managing the COVID-19 pandemic. Beginning with raising awareness, primary care healthcare providers and non-medical workers, such as ASHA workers, can play a significant role in managing the outbreak. One advantage of monkeypox over COVID-19 is that a diagnosis can be made clinically with only visual inspection of the lesions.

Conclusions:

The progressive loss of smallpox immunity may account for part of the increase in monkeypox prevalence in some endemic locations. However, the current epidemic is a timely reminder that viral emergence is an unending phenomenon with unpredictable origins, goals, and scales. More thorough knowledge of vaccination is required, and this may be achieved by urging manufacturers to regularly assess dose delivery in upcoming clinical vaccine trials and when immunizing individuals at high risk.

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