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Letter to Editor

The importance of differentiating monkeypox from chickenpox: possible response for better preparedness

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Dear Editor-in-Chief

Monkeypox is a global public health concern that needs serious attention to prevent it from spreading worldwide and encountering a new pandemic like COVID-19 again. Since the 1970s, monkeypox has been endemic in several African countries, but the biggest outbreak of monkeypox started in May 2022 in non-endemic countries (1). On June 23, 2022, the World Health Organization (WHO) declared monkeypox an "emerging threat of moderate public concern" due to the observation of more than 3,000 cases of monkeypox in more than 50 countries from five regions of the world in less than three months (2). Although monkeypox is a mild and self-limiting disease, it can cause severe consequences in pregnant women, children, and immunocompromised individuals (1). In this article, the authors described the epidemiology and clinical features of monkeypox and chickenpox in order to better equip clinicians and public health specialists to provide a correct and timely diagnosis.

Epidemiology:

Monkeypox is caused by the monkeypox virus (MPXV) and belongs to the orthopoxvirus genus of the Poxviridae family, similar to the smallpox virus. Monkeypox is a zoonotic viral disease and is transmitted through large respiratory droplets, direct contact with skin lesions, and infected fomites, but most monkeypox infections are transmitted to humans by contact with an infected animal (3). However, a recent study in India highlighted the need for active surveillance to prevent MPXV infection in the high-

risk population of men having sex with male and female sex workers (4). Chickenpox is also similar to monkeypox. Chickenpox is caused by the varicella-zoster virus. It is self-limiting but very contagious; the secondary attack rate of chickenpox is 61% to 100% (5). In high-income countries, more than 80% of the population is diagnosed before the age of 10, while in low- and middle-income countries, most people are diagnosed between the ages of 20 and 30. Most cases of chickenpox occur in winter and spring (5).

An analysis of previous outbreaks of MPXV (1970-2019) showed a significant difference in case fatality between the Central African group (10.6%) and the West African group (3.6%). The 1970 outbreak was found to affect young children, in contrast to the 2010-2019 outbreak, which affected young adults. In contrast to previous outbreaks that affected both sexes almost equally, the current outbreak appears to have originated in male community transmission of the virus through male-female (MSM) and bisexual contact (4). Therefore, an accurate and timely diagnosis of monkeypox in high-risk groups is very important.

Table 1. Clinical features of monkeypox and chickenpox

Disease	Clinical features
Monkeypox	Monkeypox begins with fever, followed by severe headache, early lymphadenopathy (swelling of the lymph nodes), back pain, myalgia (muscle ache), and intense asthenia (lack of energy). Lesions evolve from macules (lesions with a flat base) to papules (raised firm painful lesions), then to vesicles (filled with clear fluid), then to pustules (filled with pus), followed by scabs or crusts. Most of the rashes are present on the face, palms and soles (6). However, the clinical features of monkeypox cases reported in this outbreak, compared with previous outbreaks, showed unusual and atypical clinical symptoms, including anogenital lesions, rashes on the face and extremities, fever, and inguinal lymphadenopathy. The rash seen in the current outbreak showed a polymorphic presentation with fewer lesions, unlike previous outbreaks (4, 7, 8).
Chickenpox	In chickenpox, fever, weakness, and loss of appetite occur a few days before the rash. The rash is characterized by the appearance of new foci of skin lesions that progress over 5 to 7 days, from macules to papules, then to pruritic vesicles and finally to crusts. Most of the rashes are located on the trunk and are not present on the palms and soles (9).

Due to the similarity of symptoms between monkeypox and chickenpox and the uncertainty of the monkeypox outbreak resolution, it is necessary to consider special diagnostic strategies to distinguish monkeypox from chickenpox. A definitive diagnosis of monkeypox includes nucleic acid amplification testing (NAAT), i.e., PCR using different targets of the viral genome, which are necessary to detect and distinguish from other poxviruses. Several diagnostic assays were well-established in previous monkeypox epidemics (10). The use of real-time quantitative PCR (RT-qPCR) alone or in combination with sequencing is recommended by WHO (10, 11).

The three essays in the WHO interim guidelines for detecting monkeypox virus infection include (11):

1. The RT-QPCR technique detected West African Strain viruses, Congo Basin Strain, MPXV Generic.

2. RT-QPCR technique that detected variola virus, monkeypox virus, and varicellazoster virus.

3. The third technique of RT-QPCR that diagnosed orthopoxvirus, molluscipoxvirus, and parapoxvirus.

However, chickenpox diagnosis is usually a clinical diagnosis based on characteristic vesicular lesions (12). Furthermore, laboratory confirmation may be required in Persons during an outbreak or with atypical symptoms. The most sensitive method to confirm chickenpox diagnosis is using the polymerase chain reaction (PCR) to detect VZV in skin lesions, such as vesicles, crusts, and maculopapular lesions (12, 13).

The authors believe that the following points can help clinicians and public health specialists in distinguishing monkeypox from chickenpox:

- Because chickenpox is highly contagious, it typically spreads within the household and infects other family members who subsequently develop similar symptoms. This pattern is less common with monkeypox. Therefore, obtaining the family history of infection can help differentiate monkeypox from chickenpox.
- Mostly, monkeypox is transmitted to humans through contact with an infected animal, while chickenpox is transmitted through contact with a sick person. Paying attention to the history of contact with animals can help differentiate between monkeypox and chickenpox.
- The symptoms of monkeypox and chickenpox are very similar, but lymphadenopathy is mostly associated with monkeypox rather than chickenpox.
- Usually, monkeypox rashes are single and appear on the palms and soles, but chickenpox rashes are multiple and do not appear on the palms and soles.
- Most cases of chickenpox occur during the spring and winter, while the occurrence of monkeypox has an even distribution throughout the seasons.
- In the current outbreak, paying attention to the history of high-risk sexual behaviours, anogenital lesions, and inguinal lymphadenopathy is helpful in differentiating between monkeypox and chickenpox.

Finally, the clinical picture of monkeypox is very similar to chickenpox (2). Therefore, its laboratory diagnosis is very important.

Conflict of interest

The authors have no conflict of interest in this study.

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