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Short communication

Monkeypox viral disease outbreak in non-endemic countries in 2022: What clinicians and healthcare professionals need to know

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ABSTRACT

An outbreak of monkeypox Viral Disease in non-endemic countries in May 2022 is increasingly spreading. Clinicians and other healthcare professionals need to understand the aetiology and characteristics of the monkeypox pathogen and illness. By familiarizing themselves with these characteristics, they can map out the outbreak and roll out necessary public health mitigation measures to curb the spread. This short communication presents a summarized message regarding the aetiology, mode of transmission, clinical features, risk factors, diagnosis, treatment, and prevention of monkeypox viral disease. Considerations for surveillance and reporting have also been highlighted.

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1. Introduction to Monkeypox Viral Disease

Monkeypox is a zoonotic disease, a member of the orthopoxviral genus of the *Poxviridae* family which manifests in a smallpox-like disease in humans (Hammerschlag et al., 2022). The initial case in humans was positively identified and diagnosed in the Democratic Republic of Congo in 1970 although it was first isolated in Denmark from a vesico-pustular lesion of an infected cynomolgus monkey in 1958 (Farahat et al., 2022). The Human Monkeypox Viral Disease has since been reported in 11 countries in Africa. Studies have indicated that monkeypox is closely related to the variola virus (the smallpox virus), which was eradicated in the early 1980s (Daskalakis et al., 2022). As the eradication of smallpox was achieved, many countries stopped vaccination for smallpox and, as a result, the immunity of the generations that followed might have been reduced. There are two different genetic clades of monkeypox viral disease: The Congo Basin clade which is more virulent and the West African clade which is known to be relatively mild. Monkeypox viral disease is endemic in Benin, Cameroon,

Gabon, Ghana, Ivory Coast, Nigeria, South Sudan, Sierra Leone, the Republic of the Congo, the Central African Republic and the Democratic Republic of Congo (Mahase, 2022).

As of 13th September 2022, there were 19379 laboratory-confirmed cases of monkeypox viral disease reported to the World Health Organization from 29 non-endemic countries in EU/EEA. In addition, 47 cases have been reported from three Western Balkan countries and Turkey. By the time of writing this article, two deaths were reported from Spain and one from Belgium as a result of monkeypox viral disease. Five countries that have reported the most cases of monkeypox viral disease since the onset of the outbreak in May 2020 includes: Spain (6,947), France (3,784), Germany (3,547), Netherlands (1,192) and Italy (813) (Adler et al., 2022).

This paper discusses the epidemiology of the Human Monkeypox viral disease based on the available data and it highlights the mode of transmission, clinical features, risk factors, diagnosis, treatment, prevention, surveillance and reporting considerations. A section on recent advances in the knowledge of monkeypox viral disease and a short conclusion highlighting the importance of the paper and the study's limitations has also been included in the manuscript.

2. Mode of Transmission, Clinical Features and Risk Factors

Monkeypox viral disease is spread through direct contact, fomites or respiratory droplets. The disease is commonly found in younger populations below 50 years. Severe cases occur more

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commonly among children and are related to the extent of virus exposure, patient health status and nature of complications. Underlying immune deficiencies may lead to worse outcomes. The incubation period of monkeypox viral disease ranges from five days to three weeks. The major clinical features of monkeypox viral disease are similar to those of smallpox such as rashes, fever, lymphadenopathy, sore throats and headaches (Oladoye, 2021). Generally, there is a two to four day prodromal period characterised by fever and prostration before eruption begins (Adalja and Inglesby, 2022). Just like smallpox, the lesions develop instantaneously and evolve together at the same rate through papules, vesicles and pustules before umbilicating, drying and desquamating. The distribution of rashes is mainly peripheral and severe eruptions may cover the entire body. Studies have shown that the whole process may take two to four weeks depending on the disease severity. The illness has been classified into three: (i) Mild illness which has less than 25 lesions without the ability to incapacitate and is self limiting; (ii) Moderate illness which has more than 25 lesions with moderate ability to incapacitate and requires medical attention; and (iii) Severe illness which has more than 100 lesions with severe incapacity requiring urgent medical attention (Centre for Disease Prevention, 2022). Close physical contact with respiratory secretions and/or skin lesions of infected person or recently contaminated objects is a well known risk factors for monkeypox viral disease transmission. Equally, exposure to prairie dogs, sleeping in the same room or bed with an infected person, living in the same household, and drinking or eating from the same dish with an infected person (Mileto et al., 2022) have been documented as probable risk factors to the disease. Studies have also shown that consumption of bush meat could be a potential risk factor for monkeypox viral disease. There is a possibility of the disease progressing to severe complications which may include the involvement of the central nervous system and airways compromise from lymphadenitis. Mortality has been reported to range from 1% to 10% and case fatality ratio has historically ranged from 0 to 11% in the general population and has been higher among young children (Mahase, 2022).

3. Diagnosis, Treatment and Prevention of Monkeypox Viral Disease

Clinicians and healthcare workers attending to patients with new-onset of febrile illness and rash should consider monkeypox viral disease as a differential especially in the presence of lymphadenopathy. In most cases, the rash starts in the mouth, then to the face and proceeds to the entire body in a centrifugal pattern. Samples of suspected cases can be confirmed by undertaking a polymerase chain reaction (PCR) testing of the skin lesion or fluid. At the moment, there is no standard-of-care treatment for monkeypox viral disease but smallpox antivirals with poxvirus activity such as cidofovir or tecovirimat that have been used against monkeypox may prove beneficial in the management of monkeypox viral disease outbreaks. Regarding the prevention of monkeypox viral disease, the smallpox vaccines are effective in the prevention of the disease and post-exposure prophylaxis immediately after exposure can abort infection or attenuate it. In terms of post-exposure treatment, vaccination within 4 days after initial close contact with a confirmed case of monkeypox viral disease is recommended by the Centre for Disease Control and Prevention (Rizk et al., 2022). Sadly, eradication of monkeypox viral disease is not possible because of the existence of an animal reservoir. Available data has shown that the smallpox vaccine offers up to 85% protection from the disease, although contraindication in populations with a high prevalence of HIV infection has been indicated as a major challenge with the smallpox vaccine. Raising public

awareness of the risk factors and educating the population about measures to be taken to reduce exposure to the virus is the most important prevention strategy for the monkeypox viral disease (Mahase, 2022).

4. Surveillance and Reporting Considerations for Monkeypox Viral Disease

In non-endemic countries, one case of monkeypox viral disease is considered an outbreak (Quarleri et al., 2022). Due to the high virulence of the disease in some cases, clinicians should report suspected cases immediately by strictly following the standard case definition for monkeypox viral disease. Probable and confirmed cases should be reported immediately to World Health Organization under the International Health Regulations (Kaler et al., 2022). Case reports should be detailed with all biodemographic variables, date of onset of first symptoms, travel history, recent exposure to a probable or confirmed case, nature and relationship of contact with a probable or confirmed case and the recent history of multiple sexual partners. The extent of local transmission is unclear as surveillance regarding the disease has been limited, more specifically in non-endemic countries where the majority of the doctors and other healthcare workers have not come across cases of monkeypox viral disease in their routine clinical work.

5. Recent Advances in the Knowledge of Monkeypox Viral Disease

Identification of infection with monkeypox virus is complex as it has similarities between varicella-zoster virus and smallpox viral disease. The utility of the real-time quantitative polymerase chain reaction (PCR) assay and the more automated Gene Xpert MPX/OPX technique would be useful in the laboratory diagnosis of monkeypox virus. Studies have indicated the development of an on-site laboratory diagnostic test which can be used both in humans and animals. The laboratory uses an immune-filtration technique known as ABICAP (Antibody Immuno Column for Analytical Process). This technique works on gravity-driven flow-through antigen capture ELISA, different from the traditional enzyme-linked immunosorbent assays (ELISAs) and the lateral flow immunochromatographic tests (Gong et al., 2022).

6. Conclusion

There is a possibility of increased cases of monkeypox viral disease upsurges compared to cases being reported currently across the countries affected. There is also a possibility of new cases being reported in countries that have not reported any case so far. In this regard, all patients with suspected monkeypox viral disease should be investigated and if confirmed, they should be isolated until their lesions have been encased, the scab has fallen off and a new layer of skin has formed underneath (Centre for Disease Prevention, 2022).

Healthcare systems should be on high alert for patients presenting themselves with signs and symptoms of a typical rash that progresses in sequential stages- macules, papules, vesicles, pustules, and scabs at the same stage of development. These signs and symptoms may demonstrate further effects such as fever, back pains, muscle aches and enlarged lymph nodes. Equally, countries should prioritize the identification, isolation and contact tracing of monkeypox viral disease cases. Prompt diagnosis will facilitate the isolation of cases, aiding the control of the outbreak. Strengthening of laboratory diagnostic capacity for orthopoxviruses, stockpiling of personal protective equipment, strong risk communication

strategy and engagement with the vulnerable cohorts in the population should be enhanced (Gong et al., 2022).

As was mentioned in the introduction part of this manuscript, the author of this paper believes that this manuscript gives significant insights into the general epidemiology of monkeypox viral disease and it adds to the body of knowledge in the management and containment of the disease. There is a need for continued strengthening of disease surveillance and response mechanisms to improve the management of infectious disease outbreaks to a substantial level globally.

This article is descriptive and the information might be limited in that respect. However, the simplicity of its presentation may be beneficial to clinicians, healthcare professionals and the general public.

CRediT authorship contribution statement

David Onchonga: Conceptualization, Methodology, Investigation, Data curation, Writing – original draft, Supervision, Software, Visualization, Validation, Writing – review & editing, Formal analysis.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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