Elsevier has created a Monkeypox Information Center in response to the declared public health emergency of international concern, with free information in English on the monkeypox virus. The Monkeypox Information Center is hosted on Elsevier Connect, the company's public news and information website.

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Travel Medicine and Infectious Disease 49 (2022) 102387

Contents lists available at ScienceDirect

Travel Medicine and Infectious Disease

journal homepage: www.elsevier.com/locate/tmaid

Monkeypox and human transmission: Are we on the verge of another pandemic?

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Since the disease was discovered in 1970, monkeypox has been declared endemic in some countries, particularly in the west and central Africa [1]. The number of outbreaks increased over time, with 35 outbreaks occurring outside the Democratic Republic of the Congo (DRC), their majority have happened since 2010 [2]. The majority of cases were identified in rural areas and small villages located near tropical forests where human-animal interactions are frequent [3].

Recently, many cases have increasingly emerged in different regions of the world. The first case was documented in the United Kingdom. The total number of recorded cases since May 7th, 2022 has been 993 cases; 917 of them were confirmed within 29 countries. However, there have been no deaths during this period. The most common affected countries are UK (n = 225), Spain (n = 186), Portugal (n = 143), Canada (n = 80) and Germany (n = 67) while Spain has the higher number of suspected cases (48 case) [4]. Up to May 30th, the majority of UK cases were males. Moreover, they were mostly bisexual, guys, or men having sexual intercourse with men, causing the most recent surge. Unlike the previous outbreaks, the ages of cases lie between 20 and 49 years. Furthermore, most affected cases did not have a travel history into endemic areas [5].

Human monkeypox transmission occurs through close contact with skin lesions, respiratory secretions, and bodily fluids of infected animals, either with direct or indirect contact through contaminated fomites [6]. Although the Monkeypox virus (MPXV) can infect many mammalian species, the primary reservoir causing human infection has not been identified yet [7]. In addition, this virus has been isolated only from other species, such as Funisciurus squirrel, and mangabey monkey in the DRC in 1985, and Cote d'Ivoire in 2012, respectively [8,9].

This disease is clinically resembling smallpox with general clinical

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https://doi.org/10.1016/j.tmaid.2022.102387
Received 13 June 2022; Accepted 16 June 2022
Available online 21 June 2022

features such as fever, myalgia, chills, headache, malaise, and pathognomonic lymphadenopathy followed by a vesiculopustular rash. The incubation period for the recent outbreak is not yet established. However, the incubation period ranges from 5 to 21 days based on the previous literature [1,9]. Some diseases may be misdiagnosed with the monkeypox, leading to diagnostic bias such as Rickettsialpox, measles, and syphilis [10]. As a result, laboratory testing is recommended [6].

MPXV is a complex linear double-stranded DNA virus [6]. There are currently two known distinct clades of the MPXV: the less virulent West African clade and the central African (virulent Congo Basin) with mortality rates $\leq$3.6%, and up to 10%, respectively [1,6,11]. Because DNA viruses, which tend to have large genomes, accrue mutations somewhat slower than RNA viruses, finding the sequence by tracking human-to-human transmission would be less beneficial because minimal alterations to the genome could provide information on the propagation chain.

Isidro et al. analyzed the monkeypox genome sequence of nine patients and found that the 2022 MXPV belongs to the West African clade. Additionally, it is similar to the exported MXPV from Nigeria to the UK, Singapore, and Israel in 2018 and 2019. Furthermore, Isidro et al. suggested that the recent global outbreak has a single origin [12]. Interestingly, the Centers for Disease Control and Prevention (CDC) analyzed the US monkeypox cases and reported the presence of two different variants of MXPV [13].

The recent outbreak has shown to be more mutational than anticipated, which could be concerning as the virus evolves to spread more rapidly in humans. Based on known sequences, this rapid evolution began to take off around 2017. The mutation sequence could indicate that the virus has been replicating at reduced numbers among humans since then. Cases beyond the virus's endemic area have soared in the recent past, possibly prompted by events and the revival of global travel [14]. Although there are no known cases of COVID-19 and monkeypox co-existing, they can certainly co-exist, and the combination might be devastating. Coinfection of monkeypox and syphilis has been reported in HIV positive man in Prague [15]. MPXV fatalities may increase with COVID-19, raising people's concerns and fears. The COVID-19 pandemic had already sparked indignation as well as increased fear and anxiety among the general public. Owing to the high fatality rate, the combination could be dangerous. However, WHO stated that it is too early to assume that the disease will be a pandemic as COVID-19 but the governments should deal with it cautiously as the cases have risen dramatically [16]. A bibliometric assessment done by Rodriguez-Morales et al. alarms the need for more research on this re-emerging virus, which is currently expected due to the ongoing outbreak [17].

There is no specific vaccine to prevent monkeypox infection but a cross-immunity of 85% with the smallpox vaccine has been described [6]. The prevention of MXPV transmission is mainly based on the smallpox vaccine [18]. The CDC recommends the use of this vaccine for highly risked contact after 4–14 days of contact with infected subjects the infection prevention [6]. The delay in vaccine delivery after 14 days may decrease symptoms but cannot provide complete prevention of the disease. Immune globulin may also provide prophylaxis in immunocompromised individuals but there is not enough data on its benefits [19]. Infected patients should be isolated. Furthermore, the use of surgical masks and skin lesions covering is recommended [20]. The efficacy of the currently available drugs approved to treat smallpox has not been well determined in healing the monkeypox infection. These drugs include tecovirimat which is an oral intracellular viral release inhibitor, brincidofovir which is an oral DNA polymerase inhibitor, and intravenous vaccinia immune globulin [20,21].

It is of paramount importance to raise the general public awareness about the ongoing outbreak, by teaching them about the disease symptoms and when to seek medical care. Additionally, prompt surveillance measures should be deployed for the early recognition of cases and to limit the disease spread among the community. Governments should also consider offering vaccinations for the contacts of cases and to their healthcare providers. Furthermore, as many medical professionals in non-endemic countries have barely seen a case of monkeypox before, they should be trained on the appropriate management of such cases while taking full protective and safety precautions [22,23].

Funding

There was no funding for this study.

Declaration of competing interest

Authors have no conflict of interest.

Acknowledgments

None.

Abbreviation

MPXV	Monkeypox virus
DRC	the Democratic Republic of the Congo
CDC	Centers for Disease Control and Prevention
WHO	World Health Organization

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