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## Correspondence

**Monkeypox virus under COVID-19: Caution for sexual transmission – Correspondence**

Dear Editor,

In December 2019, COVID-19 broke out in Wuhan, China, and it continues to spread globally. The emergence of new variants such as Alpha (b.1.1.7), Beta (b.1.351), Gamma (P.1), Delta (b.1.617.2) and Omicron (B.1.1) warns us that virus strains is constantly mutating and can develop resistance to vaccines. According to the latest estimates of the World Health Organization (WHO), from January 2020 to December 31, 2021, nearly 15 million “excess deaths” have been directly or indirectly caused by COVID-19, with 84% of the global “excess deaths” occurring in Southeast Asia, Europe and the Americas [1]. According to the McGill COVID-19 Vaccine Tracking System, 38 vaccines have been approved in multiple countries. The WHO has granted 11 vaccines in the Emergency Use Listing (EUL) (<https://covid19.trackvaccines.org/>). COVID-19 vaccines have successfully reduced the rates of infection, disease severity, need for hospitalisation, and mortality among different populations [2]. However, there are new variants that the vaccine cannot resist and present a real threat. More worryingly, in May this year, monkeypox virus broke out in many countries around the world, and the “combination virus” may become a hidden danger.

Monkeypox is a zoonotic infection caused by the monkeypox virus. This virus is similar to smallpox virus and cowpox virus, and was first isolated and identified in 1958. We do know a lot about monkeypox even after decades of research. In fact, monkeys are not the main carriers of the virus. The virus may persist in squirrels, kangaroos, and dormice and other rodents. According to the geographical origin, monkeypox viruses can be divided into two branches: Central Africa (Congo Basin) and West Africa. The reported mortality of monkeypox caused by the Central African branch virus is as high as 10.6%, while that of the West African branch virus is 3.6%. Monkeypox virus infection has three stages: (i) Incubation period – about 6–13 days, possibly up to 21 days; (ii) Onset period – the main symptoms are fever, severe headache, swollen lymph nodes, back pain, muscle pain, and severe fatigue and weakness. Swollen lymph nodes are a distinctive feature of monkeypox in contrast to other infections such as chickenpox, measles and smallpox; and (iii) Rash period – rashes tend to be concentrated on the face and limbs, with skin changes including papules, vesicles, pustules, umbilical pus, ulcerative lesions and scabs, ranging in number from a few to thousands.

In the past few years, human-to-human transmission of monkeypox virus has been limited and patients usually give history of travel to affected areas. Monkeypox has not occurred more or less simultaneously across different countries in the past, but it has now spread to many continents. As of June 8, monkeypox outbreaks have been detected in 5 continents and 28 countries in non-endemic areas of the world. A total of 1285 confirmed cases have been reported, of which 86.5% (1112 cases) were from Europe, followed by America (153 cases), Asia (13 cases), Oceania (6 cases) and Africa (1 case). In addition, monkeypox have been

reported in eight African countries, with a total of 1526 cases and 72 deaths, and a crude case fatality rate of 4.7%. The Democratic Republic of Congo reported the highest number of cases (1366 cases and 64 deaths). These epidemiological data suggest that human-to-human transmission is driving the spread. The current outbreak is affecting more people outside Africa than ever before.

The WHO has confirmed that monkeypox virus is spreading from person to person, mainly through close contact with respiratory secretions of infected people, skin lesions, or objects contaminated with bodily fluids or diseased tissue of infected people, and through respiratory droplets. It is commonly seen in children and immunocompromised people, especially those infected with human immunodeficiency virus (HIV). The severity of the disease is related to the degree of exposure to the virus, health status of the patient, and severity of complications [3]. COVID-19 continues to mutate and become more contagious as it spreads among humans. Monkeypox has developed an average of 50 single-nucleotide polymorphisms (SNPs), and it is suspected that it may also become more infectious and more adapted to spread among humans. Community transmission of monkeypox virus has been confirmed by the United Nations [4]. The vast majority of confirmed cases reported in many countries are men who have sex with men (MSM), and in some cases symptoms even first appeared in the genital area.

The original misnomer of HIV-gay-related immune deficiency (GRID) looms in the consciousness of many gay men and provides a cautionary lesson for the monkeypox and other infectious diseases outbreaks [5]. We should pay high attention to the huge potential dangers of sexual transmission, while ensuring that the disease and sexual behaviours are not stigmatised. A correct understanding of the epidemiological characteristics of infectious diseases is essential for public health work. However, there is no known biological signature of the monkeypox virus that tends to increase the risk of infection in gay men. The virus is more likely to start with a single source of infection and spread to anyone potentially through the social environment and interpersonal life.

Although gay, bisexual and other men who have sex with men (MSM) are disproportionately reported in non-endemic countries, it also appears to be the start of a discrimination. Through coverage of social news, people have turned their attention to this group, and also made gay men to pay more vigilance about their own health problems, which hopefully can increase their chances of being diagnosed. By simply linking the spread of a disease to a particular population, it is likely that we can ignore other infectious factors and by magnifying the potential risk, healthcare systems can be misled into not taking the right public health measures to deal with it. Healthy and safe sexual behavior and correct awareness of risks are important ways to prevent the transmission.

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Finally, comprehensive tracking of the epidemiological characteristics of monkeypox virus is essential not only to allow rapid and appropriate medical and public health interventions, but also to better understand the extent and spread of the disease [6].

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