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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Correspondence

Should not airborne transmission be ignored in the 2022 monkeypox outbreak?

Dear Editor,

Although primary transmission of monkeypox infection is through direct contact with infected individuals or animals, the aerosol route plays an important role in secondary transmission [1,2]. Over 6100 monkeypox confirmed cases (https://www.monkeypoxmeter.com/) have emerged in at least 40 non-African countries as of July 4, 2022. The West African Clade of monkeypox, the culprit of the 2022 monkeypox outbreak, had shown human-to-human transmission in the monkeypox outbreak in Nigeria in 2017 [3]. It was unclear whether monkeypox had been transferred without symptoms or if MPXV had been spread through the air [4]. Monkeypox virus has evolved mechanisms to evade the host immune responses [5]. Asymptomatic MPXV infections were recorded in the Democratic Republic of Congo and the USA. Following transmission from infected animals or people, monkeypox infection begins with the infection of the dermis or respiratory epithelium, respectively [6]. The Centers for Disease Control and Prevention (CDC) acknowledges the theoretical risk of airborne transmission and recommends using airborne infection control techniques to avoid it wherever possible [7].

Infected individuals' aerosols may contain contagious viruses. The physicochemical features of virus-laden aerosols, as well as environmental parameters, such as temperature, relative humidity, UV light, airflow, and ventilation, influence their transport [8]. Due to the increased evaporation rate in dry and hot weather, the average particle size increases as more respiratory droplets are converted to aerosol particles [9], and aerosol-sized particles remain suspended in the air [10].

Different routes of human monkeypox exposure can lead to variations in the disease course in humans and monkeys [11]. Zaucha and colleagues [1] reported that aerosolized monkeypox in cynomolgus monkeys has clinicopathologic traits that are similar to monkeypox and smallpox in humans. The same was reported in the study by Nalca et al. [2]. Because the infection begins in the respiratory mucosa and spreads to local lymph nodes before the main viremia, the pathogenesis of aerosol MPXV infection is similar to that of smallpox. Verreault and colleagues [12] documented that MPXV is resistant to degradation when in an aerosol, it remains viable in suspension for up to 90 h.

Recently, Adler et al. found prolonged MPXV DNA shedding from the upper respiratory tract after skin lesion resolution [13]. They detected prolonged viral DNA in upper respiratory tract swabs. Therefore, individuals who present near to the patient during an aerosol-generating procedure (e.g., intubation) while not wearing a surgical face mask or respirator are vulnerable to MPXV infection [14]. Despite host immune responses, the route of MPXV infection, the proximity and duration of contact, and virus survival influence clinical aspects of monkeypox disease in humans. During the 2003 monkeypox outbreak in the USA, the animal-to-human transmission of MPXV infection was documented wherein Infections involving respiratory and/or mucocutaneous exposures, percutaneous and/or inoculation exposures, or both, were all possible.

Direct contact is undoubtedly the primary route for MPXV transmission in the current outbreak setting and population [15]. However, airborne transmission should be considered in the 2022 monkeypox outbreak.

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Availability of data and materials

The data in this correspondence article is not sensitive in nature and is accessible in the public domain. The data is therefore available and not of a confidential nature.

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Declaration of competing interest

None.

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