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Monkeypox transmission among international travellers—serious monkey business?

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Outbreaks of emerging zoonotic infectious diseases, such as Ebola virus, highly pathogenic avian influenza (H7N9) and Middle East respiratory syndrome, have occurred in recent years, causing infections of these relatively rare diseases among international travellers. An additional emerging zoonosis is monkeypox,[1] which was first identified in the Democratic Republic of Congo (DRC) in 1970 but since 2010 has expanded to cause outbreaks among humans in seven additional African countries: Cameroon, Central African Republic, Republic of the Congo, Liberia, Nigeria, Sierra Leone and South Sudan.[1,2] Starting in September 2017, a large, ongoing human monkeypox outbreak in Nigeria has caused 269 suspect and 115 confirmed cases from 25 states and 1 territory, including large cities.[2]

In September and October 2018, three international travellers (two from the UK and one from Israel) became infected with monkeypox after exposure in Nigeria.[2,3] Additionally, one healthcare worker who did not travel but had documented contact with one of the ill international travellers in the UK was infected.[4]

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Authors contribution

K.M.A. contributed to the development, writing the first draft and editing of the manuscript. B.W.P., D.H.H., E.S. and G.B. contributed to the manuscript writing and editing. D.H.H. contributed to the development of the project. E.S. contributed case information to the manuscript. All authors read and approved the final manuscript.

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the US Centers for Disease Control and Prevention.

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The two UK travellers were not known to be epidemiologically linked to one another: one was a Nigerian naval officer who travelled to the UK for training and the other a UK resident returning from holiday in Nigeria. Each reported a rash that started in the groin before leaving Nigeria; one traveller reported contact with an ill individual at a family gathering and wild animal meat (bushmeat) consumption. Both travellers were initially treated for other conditions, a staphylococcal infection in one traveller and a fever in the other; both received antibiotics but experienced spread of their rash and worsening symptoms.[3]

The third traveller, from Israel, was reported in October 2018 to GeoSentinel (www.istm.org/geosentinel), a global clinician-based sentinel surveillance system that monitors travel-related illness and other conditions among international travellers. The Israeli traveller sought medical attention 1 week after returning to Israel from Nigeria. He was likely infected with monkeypox in Port Harcourt, Nigeria, after exposure to two dead rodents in his home; no other animal exposures were reported.

The three travellers and one UK healthcare worker represent the first reported cases of human monkeypox detected outside Africa since 2003, when a monkeypox outbreak occurred in the USA after direct contact with ill prairie dogs which had been exposed to rodents imported from Ghana.[5] These cases also represent the first-time international travellers have been implicated in the spread of monkeypox outside of an outbreak setting. Monkeypox incidence has increased over the past 10 years, and waning smallpox vaccine immunity, which provides cross-protection against monkeypox virus as well as a large younger unimmunized susceptible population, may be contributing to this increase.[6] Civil unrest in West and Central Africa may be bringing humans and animals into closer proximity through population movement, environmental disruption and the need to eat wildlife.[1] International travellers may be at risk of acquiring monkeypox during travel to endemic countries or locations with outbreaks, especially if participating in activities that involve close personal contact with ill humans or animals. Immunocompromised travellers may be at high risk of severe complications from monkeypox, including death; four of the seven deaths reported from the Nigeria outbreak had preexisting immunocompromising conditions.[2] Pregnant women with monkeypox may have poor birth outcomes, including in utero virus transmission resulting in fetal death.[7]

As the spread of monkeypox to a healthcare worker in the UK exemplifies, ensuring appropriate clinical suspicion of monkeypox is critical for case recognition and control of virus spread. Low clinical suspicion for monkeypox, resulting in delayed personal protective equipment (PPE) use, may have resulted in nosocomial monkeypox transmission to the healthcare worker.[3] Documented monkeypox transmission has occurred within healthcare facilities in the DRC[8]; and elsewhere in Africa, there may be poor infrastructure and limited resources to effectively identify, diagnose and treat suspect cases. In addition, lack of clinical suspicion, inadequate isolation facilities and lack of PPE may play roles in the delay of appropriate isolation measures. Illness clustering is common; sequential person-to-person transmission has been documented to occur between up to six individuals.[8] Smallpox vaccination provides cross-protection against monkeypox; the vaccines[8] are not commercially available but were used for pre- and post-exposure prophylaxis among healthcare workers in close contact with the UK cases.[3] In addition to smallpox vaccine,

cidofovir, ST-246 and vaccinia immune globulin can be used for monkeypox outbreak control.[9]

Clinical suspicion for travel-related diseases can be improved if healthcare providers integrate a travel history into screening and triage of all patients to prevent the spread of emerging infectious diseases in community and healthcare settings. A detailed travel history should include the trip itinerary, including destination(s) and travel dates, activities while abroad and potential exposures (including animals and ill persons with rashes). Collecting the travel dates and relating this information to the incubation period for suspected diseases is important when forming a differential diagnosis; the typical monkeypox incubation period is 7–17 days[8] but may vary by transmission route. It is difficult to distinguish monkeypox and smallpox skin lesions, but lymphadenopathy is typically a prominent feature of monkeypox.[8,10] Healthcare providers must also maintain situational awareness of current outbreaks related to specific international destinations from the Centers for Disease Control and Prevention (CDC) at https://wwwnc.cdc.gov/travel/notices. Healthcare providers must remain vigilant about not only detecting cases but also minimizing transmission through preventive measures and optimizing access to appropriate clinical management. If a travel-related illness is suspected, consulting an infectious disease specialist is advised.

Travellers also play a role in preventing a potential infection with monkeypox while abroad. Monkeypox transmission occurs through direct contact (e.g. skin lesion exudates, faeces) with ill animals or humans, inhalation of respiratory excretions from ill humans or exposure to bushmeat.[8] Although the disease name suggests that monkeys are the primary host, the monkeypox reservoir host is unknown, but rodents are suspected[10]; monkeys, like humans, are accidental hosts. CDC recommends that travellers to Nigeria and other countries with monkeypox can help prevent a potential monkeypox infection by washing their hands often with soap and water; not touching eyes, nose or mouth; avoiding close contact with people who are sick; avoiding contact with wild animals or wild animal products and meat that could harbour the virus (including animals that are sick or have been found dead in areas where monkeypox occurs); and avoiding contact with materials, such as bedding, that have been in contact with a sick person or animal.[11] Immunocompromised travellers, including pregnant women, should avoid travel to areas experiencing a monkeypox outbreak.

Public health and clinical organizations must continue to emphasize the risk of emerging zoonoses. Continuing robust clinical surveillance of international travellers through networks such as GeoSentinel is important to alert the medical community of sentinel events of emerging zoonotic infectious diseases and prevent their spread.

The monkeypox outbreak in Nigeria, with subsequent spread to international travellers and healthcare workers treating ill persons, should serve as a reminder to remain vigilant about emerging zoonoses, such as monkeypox. Healthcare providers should counsel travellers, especially those at high risk, about monkeypox and how to avoid it; maintain clinical suspicion for monkeypox; practice prevention measures; and stay current with emerging zoonoses epidemiology.

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