

What is the monkeypox virus?

Çiğdem Arabacı¹

¹University of Health Sciences, Prof. Dr. Cemil Taşcıoğlu City Hospital, Department of Medical Microbiology, İstanbul, Turkey

ORCID IDs of the authors

ÇA: <https://orcid.org/0000-0003-0050-3225>

Correspondence:

Author: Çiğdem Arabacı

Address: University of Health Sciences, Prof. Dr. Cemil Taşcıoğlu City Hospital, Medical Microbiology Laboratory, Kaptanpaşa Street, İstanbul, Turkey

Phone: +90 506 502 21 97

e-mail: dr.c.arabaci@hotmail.com

Received: 5 May 2022

Revised: 28 December 2022

Accepted: 31 December 2022

Dear Editor,

Although the COVID-19 pandemic is not over, another new virus threatens humanity in 2022 year. This virus is called as monkeypox virus or Mpox. Monkeypox, a rare zoonotic disease, is caused by the monkeypox virus, which belongs to the Poxviridae family, the Chordopoxvirinae subfamily and the Orthopoxvirus genus (1). Monkeypox is an enveloped, double-stranded DNA virus. The genus Orthopoxvirus also includes the Variola virus (the causative agent of smallpox), the Vaccinia virus (used in the smallpox vaccine) and the Cowpox virus. The monkeypox virus has two different genetic groups, namely Central African (Congo Basin) and West African. The Central African monkeypox virus, the form of the virus that occurs in humans, has a more severe clinical condition and a higher mortality rate than the West African virus. The name monkeypox originates from the first discovery of the virus in monkeys in a laboratory in Denmark in 1958 (2). The first human case was diagnosed in the Democratic Republic of the Congo in 1970, in a 9-month-old baby boy (3). Since then, monkeypox has become endemic in the Democratic Republic of the Congo, it has spread to other African countries, mainly in Central and West Africa. Monkeypox is a disease of global public health importance, as it affects not only countries in West and Central Africa, but also the rest of the world. In 2003, the first outbreak of monkeypox outside of Africa was observed in the United States, and it was found that the virus was linked to contact with infected domestic prairie dogs. These pets were housed in the same dormitory as Gambian marsupial rats imported to the United States from Ghana. This outbreak has led to over 70 cases of monkeypox in the United States. Monkeypox has also been reported in travelers from Nigeria to Israel in September 2018, to the United Kingdom in September 2018, December 2019, May 2021 and May 2022, to Singapore in May 2019, and to the United States of America in July and November 2021. In May 2022, multiple cases of monkeypox were identified in several non-endemic countries (4).

The monkeypox virus is transmitted to humans mainly from wild animals, such as rodents and primates. It is believed that human-to-human transmission occurs primarily through inhalation of respiratory droplets. Respiratory droplets usually cannot move more than a few feet, so prolonged face-to-face contact is required for transmission. The other methods of human-to-human transmission include direct or indirect contact with body fluids and lesion material, and contact with contaminated materials such as bed decking. Feeding on undercooked meat and infected animal products is a possible risk factor for monkeypox. The virus can also be transmitted from mother to fetus through the placenta. It is currently unclear whether monkeypox can be transmitted sexually or not. Further studies are needed to better understand the methods of transmission of the virus. It has been proven that vaccination against smallpox is effective in preventing monkeypox by about 85%. For this reason, people who have received the smallpox vaccine may get over the disease more mild (4).

The symptoms of monkeypox and smallpox in humans are similar. However, monkeypox proceeds more mildly and has a self-limiting course of the disease. Monkeypox begins with symptoms of fever, headache, joint-muscle pains and fatigue. The main difference between the symptoms of smallpox and monkeypox is that lymphadenopathy is observed in monkeypox, but not in smallpox. The incubation period for monkeypox is usually 7-14 days, but this period can be between 5-21 days. The illness typically lasts 2-4 weeks. The case fatality rate is around 3-6% (5).

The diagnosis of monkeypox virus is made by polymerase chain reaction (PCR). For this, optimal diagnostic samples for monkeypox are from skin lesions—the roof or fluid from vesicles and pustules, and dry crusts. Where feasible, biopsy is an option. Lesion samples must be stored in a dry, sterile tube (no viral transport media) and kept cold. Since orthopoxviruses are serologically cross-reactive, antigen and antibody detection methods do not provide monkeypox-specific verification. Therefore, serology and antigen detection methods are not recommended for diagnosis (4).

Currently, there is no specific approved treatment for monkeypox virus infections. However, antivirals developed for use in patients with smallpox may be useful. Antiviral drugs named *cidofovir*, *brincidofovir*, *tecovirimat* (ST-246) and smallpox immunoglobulin can be applied in the treatment of infected patients. There is a vaccine named JYNNEOS™ (Imvamune and Imvanex) approved by the FDA in 2019 to be used for monkey pox disease in the USA. This attenuated vaccine is effective against smallpox and monkeypox. It is known that the vaccine is available in limited numbers to researchers working with such viruses in laboratories and for use in those who come into contact with them in the event of an epidemic. The vaccine can also be administered after contact (5).

Measures to protect against the monkey pox virus;

Avoid contact with animals that may harbor the virus (including sick or dead animals in areas where monkey pox occurs),

Avoid contact with any contaminated material that has been in contact with a sick animal,

Isolate infected patients from others who may be at risk of infection,

Practice effective hand hygiene after contact with infected animals or people. For example, washing your hands with soap and water or use alcohol-based hand sanitizer,

Use personal protective equipment (mask, gloves, cap, white coat, etc.) when contacting patients (4,5).

Conflicts of interest: The authors declare no conflict of interest.

Financial support and sponsorship: None.

Peer-review: Externally peer-reviewed.

Authorship contributions: Concept, Design, Supervision, Funding, Materials, Data collection &/or processing, Analysis and/ or interpretation, Literature search, Writing and Critical review: ÇA.

References

1. IcoToV (ICTV). Virus Taxonomy: 2020 Release. Available from: <https://talk.ictvonline.org/taxonomy>
2. Von Magnus P, Andersen EA, Petersen KB, Birch-Andersen A. A pox-like disease in cynomolgus monkeys. *Acta Path Microbiol Scand*. 1959;46(2):156-176.
3. Breman JG, Kalisa-Ruti, Steniowski MV, Zanutto E, Gromyko AI, Arita I. Human monkeypox, 1970-79. *Bull World Health Organ*. 1980;58(2):165-82.
4. <https://www.who.int/news-room/fact-sheets/detail/monkeypox>
5. Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), Division of High-Consequence Pathogens and Pathology (DHCPP) Page last reviewed:2022

Copyright© 2022 The Author(s) Published by The Injector

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-No Derivatives License 4.0 (CC BY-NC-ND 4.0) where it is permissible to download, share, remix, transform, and build up the work provided it is properly cited. The work cannot be used commercially