



“Monkeypox Virus Infection in Humans”

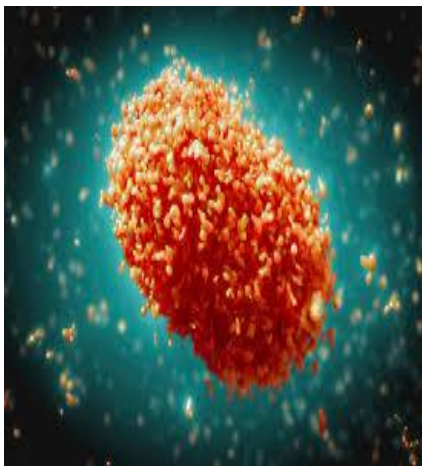
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INTRODUCTION



Monkey pox is an illness caused by the monkey pox virus. It is a viral zoonotic infection, meaning that it can spread from animals to humans. It can also spread from humans to other humans and from the environment to humans. Monkey pox spreads from person-to-person through close contact with someone who has a monkey pox rash. Close contact can mean being face-to-face (such as talking, breathing or singing close to one another which can generate droplets or short-range aerosols); skin-to-skin (such as touching or vaginal/anal sex); mouth-to-mouth (such as kissing); or mouth-to-skin contact (such as oral sex or kissing the skin). Possible mechanisms of transmission through the air for monkey pox are not yet well understood and studies are underway to learn more. We are still learning about how long people with monkey pox are infectious for, but generally they are considered infectious until all of their sores have crusted over, the scabs have fallen off and a new layer of skin has formed underneath, and all the sores on the eyes and in the body (in the mouth, throat, eyes, vagina and anus) have healed too.

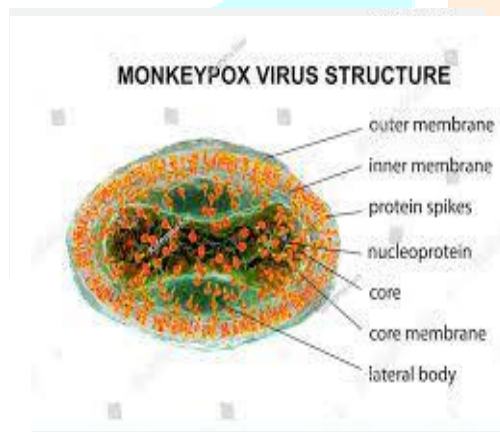


Before April 2022, monkeypox virus infection in humans was seldom reported outside African regions where it is endemic. Currently, cases are occurring worldwide. Transmission, risk factors, clinical presentation, and outcomes of infection are poorly defined. On July 14, India reported its first case of monkey pox in a 35-year-old man with a travel history from the United Arab Emirates (UAE) to Kerala making it the first documented case in the Southeast Asian region. Over the past month, cases in India have continued to inch up. As of August

8, 2022, the country reported nine confirmed cases of monkeypox, five from Kerala, in the southwest of India, and four from Delhi, more than 2,600 kilometers to the north. The Indian Council on Medical Research (ICMR) isolated the virus strain A.2 from the first two reported cases, and it is different from the one that's affecting people in the European Union. Five cases are linked to international travel. Diwakar Kulkarni, former director and principal scientist at the Indian Council of Agricultural Research - National Institute of High Security Animal Diseases (ICAR-NIHSAD), in Bhopal, said, "The isolated cases of monkeypox reported in Delhi with no prior travel history emphasize the importance of tracing the source of the infection, perhaps transmission through rodent population."

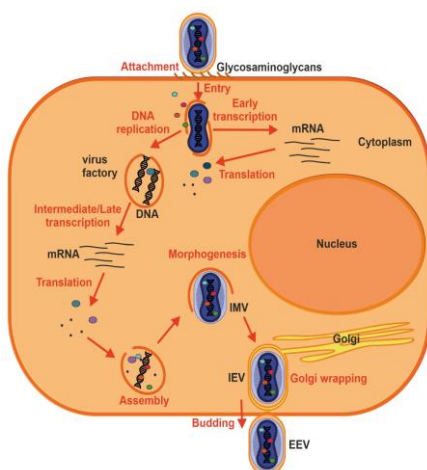
Human-to-human monkeypox spread can occur through contact with respiratory droplets, skin lesions, dry scabs, fomites, and sexual contact. Transmission from an infected mother to her fetus can also take place. It tends to be less severe than smallpox, with an incubation period of 6 to 13 days (but up to as many as 21 days) and symptoms that can last for 2 to 4 weeks. It typically causes fever with a rash but its distinguishing feature from smallpox, measles, and chickenpox is the presence of lymph node swelling and its distinctive rash. The current case fatality ratio ranges from 3 to 6 percent but it may go up to 11 percent, and it can be higher among children. Monkeypox diagnosis is conducted through polymerase chain reaction (PCR) tests from skin samples.

Etiology



Monkeypox belongs to the family: Poxviridae, subfamily: chordopoxvirinae, genus: orthopoxvirus, and species: Monkeypox virus. On electron microscopy, the monkeypox virus is relatively large (200-250 nanometers). Poxviruses are brick-shaped, surrounded by a lipoprotein envelope with a linear double-stranded DNA genome. The animal reservoir for the disease is thought to include squirrels, rats, monkeys, primates, prairie dogs, hedgehogs, pigs, and mice found in the African regions where Monkeypox was previously widely reported from. are high in bodily fluids including urine, saliva, semen, and feces as well as in swabs taken from the oropharynx and rectum suggesting that sexual transmission is a major driver of transmission.

Pathophysiology



viremia leading to 1 to 2 days of prodromal symptoms such as fever and lymphadenopathy before lesions appear. Infected patients may be contagious at this time. Lesions start in the oropharynx and then appear on the skin. Serum antibodies are often detectable by the time lesions appear. Rash progression is described in more detail in the History and Physical section.

Clinical Evaluation

Considering the similarities between human monkeypox infection and smallpox, the “Acute, Generalized Vesicular or Pustular Rash Illness Protocol” created by the CDC with the addition of lymphadenopathy to requisite primary criteria could be used to determine which patients warrant further testing. The CDC recommends collection of two specimens, each from multiple lesions from different locations. The testing algorithm also includes non-variola Orthopoxvirus testing, with further characterization testing at CDC.

Monkeypox infection can be confirmed via isolation in viral culture or by PCR for monkeypox virus DNA from a patient specimen. Alternatively, tests indicating the presence of Orthopoxvirus in a patient specimen, barring patient exposure to another of the same genus, can be sufficiently diagnostic, such as visualization on electron microscopy, immune histochemical staining for orthopoxvirus antigens, serum studies for anti-orthopoxvirus IgM (indicating recent exposure) and IgG (indicating prior exposure or vaccination).

Treatment / Management

According to World Health Organization (WHO), more than 18,000 cases have been reported from 78 countries and there have been five reported deaths so far. There is no specific treatment for Monkey pox yet. Monkey pox-infected patients are advised to stay isolated. “Vaccination against smallpox was demonstrated through several observational studies to be about 85% effective in preventing monkey pox treatment. But because the viruses that cause monkey pox and smallpox are similar, antiviral drugs developed to protect against smallpox may be used to treat monkey pox effectively, Symptomatic treatment is given along with antiviral drugs.

For severe cases, investigational use can be considered for compounds with demonstrated benefit against orthopoxviruses in animal studies and severe vaccinia vaccine complications. The oral DNA polymerase inhibitor brincidofovir, oral intracellular viral release inhibitor tecovirimat, and intravenous vaccinia immune globulin have unknown efficacy against the monkeypox virus. Dual therapy with tecovirimat and brincidofovir can be trialed in severe cases. Tecovirimat inhibits viral envelope protein VP37, thus blocking viral maturation as well as the release of the virus from infected cells. Brincidofovir is approved for the treatment of smallpox in the US. Normal saline and probenecid should be given concurrently with cidofovir. Vaccinia Immune Globulin (VIG) is licensed by the FDA for the treatment of complications of vaccinia vaccination. The effectiveness of VIG against smallpox and monkeypox is uncertain, and VIG has not been trialed in humans for smallpox or monkeypox. For individuals exposed to the virus, temperature and symptoms should be monitored twice per day for 21 days because that is the accepted upper limit of the monkeypox incubation period. Infectiousness aligns with symptom onset; therefore, close contacts need not isolate while asymptomatic. In some cases, post-exposure vaccination with modified vaccinia, Ankara vaccine (smallpox and monkeypox vaccine, live, non-replicating) is recommended. Contact between broken skin or mucous membranes and an infected patient’s body fluids, respiratory droplets, or scabs is considered a “high risk” exposure that warrants post-exposure vaccination as soon as possible. According to the CDC, vaccination within four days of exposure may prevent disease onset, and vaccination within 14 days may reduce disease severity. The replication-defective modified vaccinia Ankara vaccine is a two-shot series, four weeks apart, with a superior safety profile compared to first

and second-generation smallpox vaccines. Unlike live vaccinia virus preparations, administering modified vaccinia, Ankara does not create a skin lesion or pose a risk of local or disseminated spread. In addition, clinical trials have shown that modified vaccinia Ankara is safe and stimulates antibody production in patients with atopy and compromised immune systems, which are known contraindications to live vaccinia administration. Identifying the potential benefits and drawbacks of preventative monkeypox vaccination in endemic communities requires more thorough data collection and feasibility analysis. Access to medical care, testing capabilities, and infrastructure limits the ability to make informed decisions about best addressing this neglected tropical disease

Conclusion

The spread of infectious diseases requires a susceptible population and opportunities for transmission. Individual and herd immunity to monkeypox, previously achieved through widespread vaccinia vaccination, has declined since the 1980s, increasing human susceptibility to outbreaks. In addition, interim sociopolitical and ecological changes in endemic regions likely increased human exposure to animal reservoirs. Due to the range of monkeypox disease severity, an infected patient may present to the emergency department, urgent care, or primary care setting. The ability of an interprofessional team of physicians, nurses, virologists, veterinarians, and public health experts to promptly identify monkeypox infection in humans and animals, implement protective measures, and initiate public health reporting creates a bulwark against a devastating outbreak. Education of patients and healthcare workers in regions where the monkeypox virus is endemic is of the utmost importance. Local containment is the best defense against the worldwide spread. Historically, the monkeypox virus has a limited ability to spread between humans. Nonetheless, the waning population of people vaccinated against smallpox paves the way for an increased prevalence of human monkeypox, increasing viral mutation opportunities. Therefore, improving patient recognition of this disease, reporting fidelity, and access to diagnostic capabilities are critical actions for collecting the data necessary to gain a deeper understanding of and strengthened defense against monkeypox.

REFERANCES

- Osadebe L,Hughes CM,Shongo Lushima R,Kabamba J,Nguede B,Malekani J,Pukuta E,Karhemere S,Muyembe Tamfum JJ,Wemakoy Okitolonda E,Reynolds MG,McCollum AM, Enhancing case definitions for surveillance of human monkeypox in the Democratic Republic of Congo. PLoS neglected tropical diseases. 2017 Sep;
- Aden TA,Blevins P,York SW,Rager S,Balachandran D,Hutson CL,Lowe D,Mangal CN,Wolford T,Matheny A,Davidson W,Wilkins K,Cook R,Roulo RM,White MK,Berman L,Murray J,Laurance J,Francis D,Green NM,Berumen RA 3rd,Gonzalez A,Evans S,Hudziec M,Noel D,Adjei M,Hovan G,Lee P,Tate L,Gose RB,Voermans R,Crew J,Adam PR,Haydel D,Lukula S,Matluk N,Shah S,Featherst
- Wittek R, Vaccinia immune globulin: current policies, preparedness, and product safety and efficacy. International journal of infectious diseases : IJID : official publication of the International Society for Infectious Diseases. 2006 May
- Reynolds MG,McCollum AM,Nguede B,Shongo Lushima R,Petersen BW, Improving the Care and Treatment of Monkeypox Patients in Low-Resource Settings: Applying Evidence from Contemporary Biomedical and Smallpox Biodefense Research. Viruses. 2017 Dec 12;
- Vivancos R,Anderson C,Blomquist P,Balasegaram S,Bell A,Bishop L,Brown CS,Chow Y,Edeghere O,Florence I,Logan S,Manley P,Crowe W,McAuley A,Shankar AG,Mora-Peris B,Paranthaman K,Prochazka M,Ryan C,Simons D,Vipond R,Byers C,Watkins NA,UKHSA Monkeypox Incident Management team.,
- Welfare W,Whittaker E,Dewsnap C,Wilson A,Young Y,Chand M,Riley S,Hopkins S,Monkeypox Incident Management Team., Community transmission of monkeypox in the United Kingdom, April to May 2022. Euro surveillance : bulletin Europeen sur les maladies transmissibles = European communicable disease bulletin. 2022 Jun