



NASSAU COUNTY MEDICAL SOCIETY

The Pulse Point

MONKEYPOX BY GERALD ENTE, MD, FAAP

Another “new” disease has come to our shores. **Monkeypox**, endemic in the tropical rainforest areas of central and west Africa was first diagnosed in Europe and in the US in May 2022. Monkeypox has always been known as an uncommon zoonotic viral disease, not at all related to Chicken Pox but in the same family as Smallpox [genus Orthopoxvirus, family Poxviridae, which also includes camelpox, cowpox, and horsepox]. This disease was first discovered in 1958 in Denmark by an infected laboratory monkey. The first human monkeypox case dates back to 1970 when a 9-year-old boy in a remote part of the Congo was diagnosed.

In September 2017, an 11-year-old boy was treated in Nigeria for “a strange rash and sores in his mouth.” This was finally diagnosed as monkeypox and was the **first known case** of this international outbreak. Up to then, local outbreaks were small, mild, self-limited, and mostly occurred in children in Africa who played with monkeys or other small wild animals. Then the disease spread exponentially mostly affecting 20 to 40-year-old men, who had extensive genital lesions. Further assessment showed that these men had high-risk sexual behaviors including sex with multiple partners and prostitutes. Genetic data has proven that this outbreak is ongoing and likely to become worse.

Monkeypox has an **incubation period** of 5 to 21 days (median 7-10 days) and usually has symptoms lasting from 2 to 4 weeks. Severe disease is rare and the fatality rate has been between 1% to 10%. There are 2 varieties of this virus: one from the Congo Basin or Central Africa which kills 1 in 10 patients; the other from West Africa which has a mortality rate under 1%. Luckily this second virus is the virus causing this epidemic. Human-to-human transmission is by close skin-to-skin contact.

Monkeypox has sickened more than **52,700 people in 93 non-endemic countries** with over 20,000 cases from all 50 states reported in the US as of 9/5/22. Globally, 10 people have died of this disease. The question is: how has the **infectiousness of this virus suddenly changed** from infecting occasional travelers coming out of Africa to becoming a major worldwide epidemic? The London School of Hygiene and Tropical Medicine supports the idea that this virus entered several networks of men having sex with men [MSM], many of whom had multiple partners, and morphed into an easily spreading virus via sexual close prolonged skin contact. Ninety-eight percent of reported cases have been in MSM but anyone can become infected with this virus. Asymptomatic cases have been reported. This disease has raised stigma in the MSM community since sexual encounters do play a role in transmission. One reason why this number may be so high is that there is a positive health-seeking behavior in this population. It is important to point out to the MSM population that **it is not who you are, but how you are doing what you are doing**. This virus, as well as viral DNA, have been found in semen but it is not certain that this is as important in transmission as close skin-to-skin contact. [The same is true for transmission of Herpes and Scabies.]

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Monkeypox is less contagious than Covid-19. Monkeypox is not classified as an STI.

The **symptoms and signs**, which are dermatologic, neurologic, and/or systemic, may include rash, fever, headache, myalgia, pain, chills, exhaustion, swollen painful lymphadenopathy, and sore throat. Myocarditis and encephalitis have been reported. There may or may not be prodromal symptoms. The rash may be limited to a single lesion in the genital area or a lesion hidden in the mucous membranes of the anus, mouth, or vagina causing severe pain and being difficult to see. The rash may start in the mouth and spread to the face and body centrifugally. The rash may precede other signs or symptoms. A significant number of patients have only a single genital ulcer making it difficult to differentiate from STIs, which may or may not spread out from there with itchy or painful lesions. These skin lesions, anywhere from a few to thousands, may be filled with pus, are firm, deep-seated, and umbilicated, and may leave permanent scars. They may be present in the palms and soles and various stages of the rash are present at the same time. These lesions are contagious and have been called 'little viral factories'. Some patients have experienced confusion and seizures. Some lesions look like mosquito bites or ingrown hairs. Patients with a new febrile illness and a rash should cause a high suspicion and be evaluated for monkeypox. Monkeypox is easy to misdiagnose.

Transmissibility of this virus is through intimate contact of any kind, including kissing, touching, oral and penetrative vaginal and anal sex - not from a quick touch of a doorknob. It may be spread via clothing, bedding, towels, and other contaminated materials. Household contacts are at risk. There is question as to whether this is transmitted via an airborne route through coughing and sneezing although we know that prolonged face-to-face contact can spread this through respiratory secretions. At least 6 children have been infected and the first disease in a pregnant woman in the US has been reported. There is scant information about women in the literature although a woman in Virginia was confirmed by CDC to have monkeypox.

PCR test of the cells [done by swabbing a lesion] or fluid is diagnostic. Suspicion of the diagnosis warrants testing. The diagnosis of an STI does not rule out monkeypox as concurrent infection may be present. The primary diagnostic test is from the lesion and not from a blood sample because blood will be positive only when viremia occurs. Blood tests are useful to evaluate the immune status of the individual. Suspected cases must be reported to local Health Departments

Treatment, when needed, consists of antivirals with poxvirus activity not specifically approved for monkeypox, like Vistide [cidofovir by Gilead Sciences], Tembexa [brincidofovir by Chimerix], and TPOXX [tecovirimat by SIGA Technologies]. Presently, there is no standard of care treatment here and only anecdotal reports of benefits and risks. As with most viral diseases, the majority of patients will have no, minimal or moderate symptoms. Supportive treatment, including pain medications, should be routine.

A pet dog in France has contracted the disease from her owners by sleeping in the same bed while being infected. This is the first case of **human-to-animal transmission**. Many small wild animals including monkeys, rodents, rats, and squirrels are infected with this virus, but we have not yet found the animal reservoir. Infected people should not be close to their animals.

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For prevention, there are 2 vaccines available.

FDA has given **Jynneos** [Bavarian Nordic] an indication for prevention of monkeypox and an older-generation vaccine (**ACAM2000**, Pasteur Biologics Co.) may be used off-label still percutaneously). Either of these administered immediately after suspected exposure is expected to abort or significantly lessen the disease. Jynneos vaccine has fewer side effects and may be given to people 18 years and older, to those under 18 for special reasons, to immunocompromised patients, pregnant and breast-feeding women and children as well as patients with certain exfoliative skin conditions like eczema. Jynneos contains a live virus that does not replicate well in humans. Jynneos also may be given to patients with heart disease while ACAM2000 should not be used because of the risk of myocarditis. Jynneos may be used preventively pre-exposure or post-exposure. It is given in 2 doses 4 weeks apart. Massachusetts General Hospital vaccinated its healthcare workers as a precaution in late May '22. When these vaccines are not available, vaccinia immune globulin may be given. Older people who had received smallpox vaccination have been afforded some immunity (we do not know how much). In the US smallpox was eradicated in 1971 and the routine use of smallpox vaccinations was stopped in 1972. (In England this was in 1980.) US supply of monkeypox vaccine will be limited for months after officials waited too long to request an adequate number of new supplies. To maximize our supply, Jynneos is given one-fifth of the vial intradermally. Whether given intradermally, or subcutaneously, this shot frequently leaves a small bump that may last for 2-4 weeks. The US Strategic National Stockpile was supposed to hedge against viral contingencies. This has not happened. The Biden administration, in August, stated that it may need \$7 billion to mount a proper response to this problem. In September, the White House asked for another \$4.7 billion in emergency funding. This vaccine has many breakthrough infections. Very few people in the US are getting the second shot.

The W.H.O., NYS, and NYC as well as California and Illinois have declared Monkeypox to be a Public Health Emergency. The future, globally and for the US, depends on how quickly control efforts are accomplished. The US and many other countries have issued guidance. Education about this illness including how to reduce the risk of infection must be universal. Vaccine production must be increased and equitably offered globally. Healthcare workers must have an increased awareness of these infections well as be protected from them. Faster diagnosis will result in faster isolation of patients and faster treatment of patients which will reduce future potential transmission. As of 8/3/22, case numbers are doubling every 5-7 days. Monkeypox is on its way to becoming a permanent threat to the US and the world. Presently, monkeypox affects mostly the gay and bisexual community, but the W.H.O. has warned that this virus is capable of evolving at any moment to infect anyone with four groups of people at the highest risk: newborns, children, pregnant women, and the immunocompromised.

After more than two years of tumultuous dealing with the Covid-19 pandemic, the thought of another potential Public Health Emergency becoming a second, concomitant pandemic is frightening. The similarities in the early history of both of these epidemics and the recent mutations of the monkeypox virus indicate the need for the US and the rest of the world to quickly and seriously do everything possible to contain the spread of monkeypox.