IN THE NAME OF GOD

monkeypox vaccine & prevention

B. Sobouti M.D.
Professor of Pediatric Infectious Diseases
IUMS
2022

Many people infected with monkeypox virus (MPX) have a mild ,self limiting diseases course in the absence of specific therapy. However, the prognosis for monkeypox depends on multiple factors , such as previous vaccination status , initial health status , concurrent illnesses, and comorbidities among others.

Risk for the broader population

Based on the evidence from the cases in this outbreak detected to date, overall, the probability of further spread of MPXV among the broader population in EU/EEA countries and globally in the coming months, is assessed as very low leading to an overall low risk for the general population. However, the individual risk for very young children, pregnant women, elderly or immunocompromised individuals among close contacts of MPX cases may be high due to the higher impact of the disease in these groups.

Risk for healthcare workers(HCWs)

The probability of MPX transmission to HCWs wearing appropriate personal protective equipment (a disposable gown, disposable gloves, disposable shoe or boots covers, respiratory protection filtering face piece (FFP2) respirator, and eye splash protection (goggles or visor) is very low , with the disease having an estimated low impact, leading to an overall low risk.

The risk to HCWs with unprotected close contact with MPX cases (e.g. contact face-to-face for prolonged time, contact with open lesions without gloves, intubation or other invasive medical procedure) is assessed as moderate, equivalent to that of a close contact.

Risk for laboratory personnel

Occupational exposure and infection from orthopoxviruses have been occasionally reported among laboratory personnel handling virus-containing specimens.

The risk of occupational exposure is estimated to be low for trained laboratory personnel following appropriate biosafety procedures.

Unprotected occupational exposure in a laboratory, particularly involving spillage or aerosolisation with exposure of mucosa, carries high probability of infection and moderate risk of the disease(due to the direct exposure of mucosae to potentially significant quantity of virus).The risk for unprotected laboratory personnel is assessed as high .

Personal protective equipment

As indicated previous slides human-to-human transmission of MPXV can occur via droplets in prolonged close contact and contact with the infectious lesion material . Therefore, appropriate PPE is needed for all health professionals who will screen suspected cases, care for a MPX patients or handle contaminated material (clothes, bedlinen, etc.) or laboratory specimens (gown, FFP2 respirators, goggles). Availability of sufficient stocks of PPE at healthcare facilities and at national levels should be monitored and ensured.

Vaccine

ACAM2000 is administered as a live *Vaccinia virus* preparation that is inoculated into the skin by pricking the skin surface. Following a successful inoculation, a lesion will develop at the site of the vaccination. The virus growing at the site of this inoculation lesion can be spread to other parts of the body or even to other people. Individuals who receive vaccination with ACAM2000 must take precautions to prevent the spread of the vaccine virus and are considered vaccinated within 28 days.

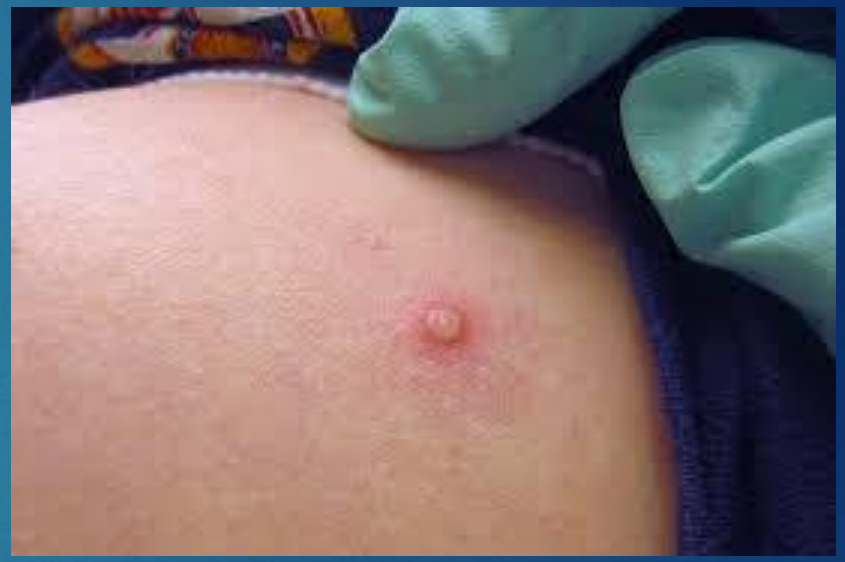
JYNNEOS™ is administered as a live virus that is non-replicating. It is administered as two subcutaneous injections four weeks apart. There is no visible "take" and as a result, no risk for spread to other parts of the body or other people. People who receive JYNNEOS ™ are not considered vaccinated until 2 weeks after they receive the second dose of the vaccine.

Vaccine

When properly administered before an exposure, vaccines are effective at protecting people against monkeypox.

ACAM2000 and JYNNEOS™ (also known as Imvamune or Imvanex) are the two currently licensed vaccines in the United States to prevent smallpox.

CDC, in conjunction with the Advisory Committee on Immunization Practices (ACIP), provides recommendations on who should receive smallpox vaccination in a non-emergency setting. At this time, vaccination with ACAM2000 is recommended for laboratorians working with certain orthopoxviruses and military personnel. On November 3, 2021, ACIP voted to recommend JYNNEOS pre-exposure prophylaxis as an alternative to ACAM2000 for certain persons at risk for exposure to orthopoxviruses.



Pre-exposure prophylaxis to prevent monkeypox

The Advisory Committee on Immunization Practices (ACIP) recommends that people whose jobs may expose them to orthopoxviruses, such as monkeypox, get vaccinated with either ACAM2000 or JYNNEOS to protect them if they are exposed to an orthopoxvirus. This is known as pre-exposure prophylaxis (PrEP). People who should get PrEP include:

- Clinical laboratory personnel who perform testing to diagnose orthopoxviruses, including those who use polymerase chain reaction (PCR) assays for diagnosis of orthopoxviruses, including *Monkeypox virus*
- Research laboratory workers who directly handle cultures or animals contaminated or infected with orthopoxviruses that infect humans, including *Monkeypox virus, replication-competent Vaccinia virus, or recombinant Vaccinia viruses derived from replication-competent Vaccinia virus strains*
- Certain healthcare and public health response team members designated by public health authorities to be vaccinated for preparedness purposes

People who can get PrEP if they want to receive it include healthcare personnel who administer ACAM2000 or anticipate caring for many patients with monkeypox.

Vaccine effectiveness

Because *Monkeypox virus* is closely related to the virus that causes smallpox, the smallpox vaccine can protect people from getting monkeypox. Past data from Africa suggests that the smallpox vaccine is at least 85% effective in preventing monkeypox. The effectiveness of JYNNEOS™ against monkeypox was concluded from a clinical study on the immunogenicity of JYNNEOS and efficacy data from animal studies.

Smallpox and monkeypox vaccines are effective at protecting people against monkeypox when given before exposure to monkeypox. Experts also believe that vaccination after a monkeypox exposure may help prevent the disease or make it less severe.

Receiving Vaccine After Exposure to Monkeypox Virus

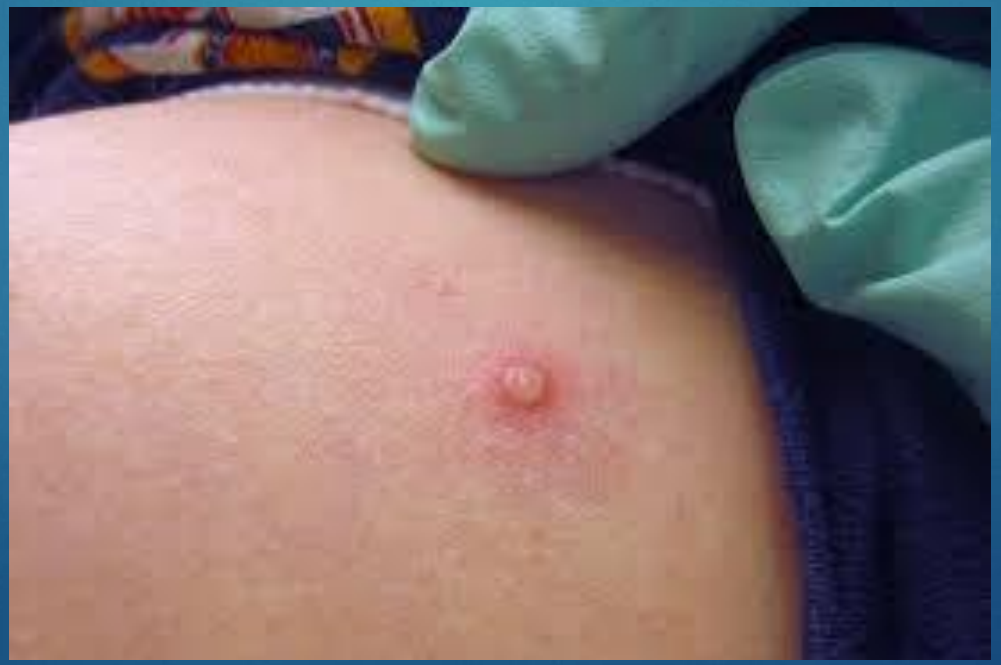
The sooner an exposed person gets the vaccine, the better.

CDC recommends that the vaccine be given within 4 days from the date of exposure in order to prevent onset of the disease. If given between 4–14 days after the date of exposure, vaccination may reduce the symptoms of disease, but may not prevent the disease.

Revaccination After Exposure

Persons exposed to monkeypox virus and who have not received the smallpox vaccine within the last 3 years, should consider getting vaccinated.

The sooner the person receives the vaccine, the more effective it will be in protecting against monkeypox virus.



Vaccine Risks vs. Monkeypox Disease

For most persons who have been exposed to monkeypox, the risks from monkeypox disease are greater than the risks from the smallpox or monkeypox vaccine.

Monkeypox is a serious disease. It causes fever, headache, muscle aches, backache, swollen lymph nodes, a general feeling of discomfort, exhaustion, and severe rash. Studies of monkeypox in Central Africa—where people live in remote areas and are medically underserved—showed that the disease killed up to 11% of people infected.

In contrast, most people who get the smallpox or monkeypox vaccine have only minor reactions, like mild fever, tiredness, swollen glands, and redness and itching at the place where the vaccine is given. However, these vaccines do have more serious risks, too.

In certain groups of people, such as people with serious immune system problems, complications from ACAM2000 can be severe. If you have concerns about whether you should receive ACAM2000, talk to your healthcare provider. This vaccine has the potential for more side effects and adverse events than the newer vaccine, JYNNEOS.

Treatment

- Tecovirimat(TPOXX,ST-246)
- Vaccinia immune globulin intravenous(VIGIV)
- Cidofovir(vistide)
- Brincidofovir(CMX001/Tembexa)


THANK YOU
FOR YOUR
ATTENTION
Adobe Stock | #379485379