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The impact of monkeypox in pregnant patients on obstetric anesthesiology

We write in regard to the 2022 monkeypox virus (Mpox) outbreak and consider the implications of Mpox infection during pregnancy on the practice of obstetric anesthesiology. As of December 5, 2022 there have been 82 062 confirmed cases of Mpox, with over 98% occurring in non-endemic countries.[1]

The Centers for Disease Control and Prevention reported the first case of Mpox in a pregnant person in the USA on July 23, 2022.[2] The newborn received prophylactic immunoglobulin and did not show signs of Mpox infection, and as of July 27, 2022, both mother and newborn were doing well.[2] Data regarding Mpox, albeit limited, suggest the virus can be transmitted transplacentally or via close contact perinatally.[3] There are five reported cases of Mpox infection in pregnant individuals (Table 1). The first was in Zaire in 1983, where a person diagnosed with Mpox at 24 weeks' gestation delivered a premature infant six weeks later.[4] The infant had a generalized skin rash at birth and died at 6.5 weeks, reportedly from malnutrition.[4,5] The remaining four cases were identified during a 2007–2011 observational study in the Democratic Republic of Congo. Three individuals suffered fetal loss, including two first trimester miscarriages and one stillbirth, while the fourth gave birth to a healthy infant.[6] The stillborn infant presented with a diffuse maculopapular skin rash, and Mpox virus DNA was detected in fetal tissue, the umbilical cord and the placenta.[7] Although unknown, these historical cases support the possibility of increased Mpox infection severity during pregnancy, risk of transmission to the fetus, and risk for severe infection in newborn.[3] Clinicians should remain vigilant while treating pregnant patients with suspected Mpox infection because the risk factors determining a severe adverse pregnancy outcomes remain unknown. It may be beneficial to perform serial ultrasound surveillance for signs of congenital infection in pregnant people with PCR-confirmed Mpox infection, given this unknown risk to the fetus.[8] Ultrasound findings of hepatomegaly, ascites, hydrops, placental calcifications, and fetal growth restriction would raise suspicion of fetal infection and justify amniocentesis with real-time PCR.[8]

The early diagnosis of Mpox in pregnant individuals is challenging given nonspecific prodromal symptoms (Fig. 1).[3,9] Recent guidelines stress the importance of ruling out varicella, herpes simplex, and syphilis, which may resemble Mpox infection.[7] Prevention of Mpox poses additional challenges as prophylactic vaccination with ACAM2000 is contraindicated in pregnancy.[3] While the only FDA-approved vaccine for Mpox, JYNNEOS, can be offered to pregnant individuals, human data are insufficient to determine if there are associated risks in pregnancy.[3] There are additional treatment limitations in pregnant individuals, as antiviral therapies used to treat Mpox infection, such as cidofovir and brincidofovir, show evidence of teratogenicity in animal models.[3] Although there are currently no data on

Table 1
Reported cases of Mpox virus infection during pregnancy.

Year, Location	Gestational Age at Time of Diagnosis	Pregnancy Outcome	Time between Illness Onset and Reported Outcome	Clinical Findings
1983, Zaire[5,6]	~5.5 months	Preterm birth	6 weeks	Maternal: initial presentation included fever followed by skin rash Newborn: generalized skin rash present at birth, birth weight < 1500 g; subsequent neonatal death due to "malnutrition" at 6.5 weeks old
2007–2011, DRC[5,6]	First trimester	Miscarriage	14 days	Maternal: moderate to severe infection Miscarriage products were not tested
2007–2011, DRC[5,6]	First trimester	Miscarriage	24 days	Maternal: moderate to severe infection Miscarriage products were not tested
2007–2011, DRC[5,6]	18 weeks	Stillbirth	21 days	Maternal: MPXV[a] viremia level rose rapidly upon cessation of fetal movement Fetus: diffuse maculopapular lesions, hydrops fetalis, hepatomegaly; virus isolated in fetal tissue and placenta
2007–2011, DRC[5,6]	14 weeks	Full-term, live birth	6 months	Maternal: mild infection Newborn: no symptoms reported
2022, United States[2]	*	Live birth	*	Maternal: doing well per CDC[b] Newborn: no signs of infection, received prophylactic immune globulin

[a] Monkeypox virus.
[b] Centers for Disease Control and Prevention.
* Data currently unavailable.

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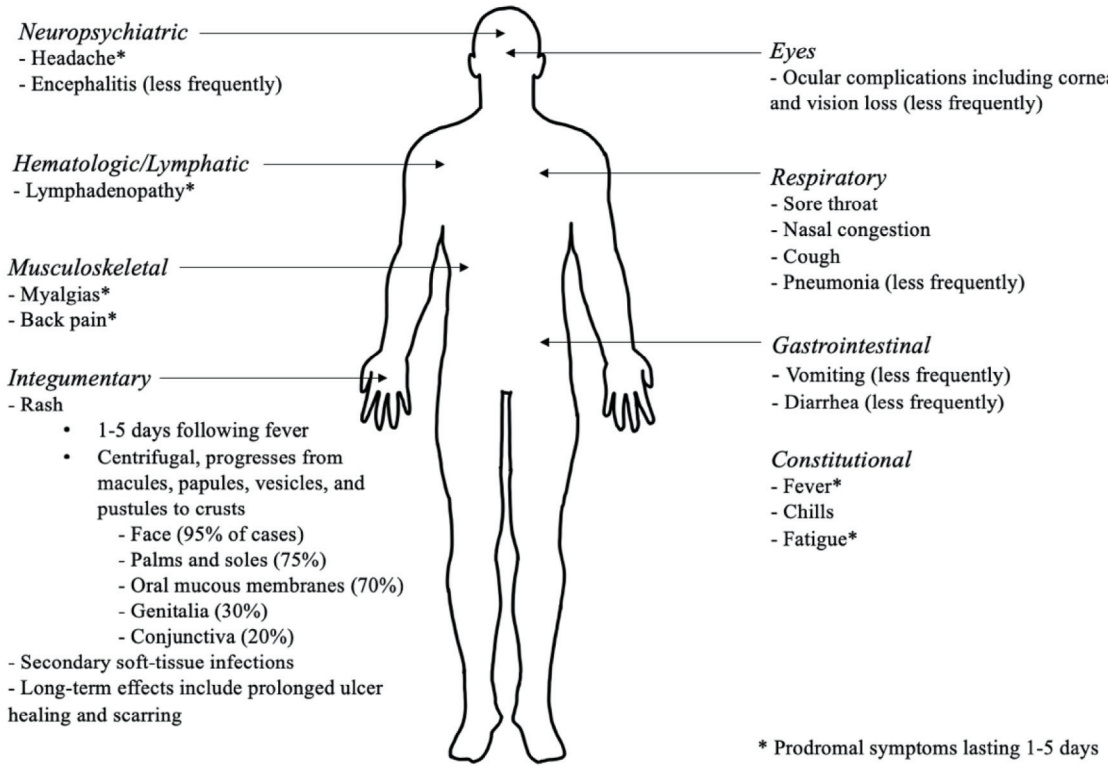

Fig. 1. Symptoms of Mpox virus infection.

the use of tecovirimat during pregnancy, at present it is recommended as the first-line antiviral for pregnant patients.[3] Counselling on the potential risks of vaccination and therapies in pregnancy will be increasingly important.

It is essential that obstetric anesthesiologists understand the implications of Mpox infection when formulating anesthetic plans. Patients with Mpox are at increased risk of liver and kidney dysfunction, abscesses, and sepsis.[10] Animal studies have shown that Mpox can lead to acute respiratory distress syndrome, therefore improved understanding can guide management with ventilator settings.[10] Additionally, given the pattern of presentation has primarily been anogenital lesions associated with sexual contact, these lesions, if present, are a likely indication for cesarean delivery: exposure to lesions during vaginal birth may increase the risk of fulminant neonatal sepsis.[8] There are currently no data regarding the risk of central nervous system (CNS) infection after neuraxial techniques in patients with Mpox, although neurological complications of Mpox otherwise appear to be rare.[10] The theoretical risk of CNS infection should be weighed against the risks associated with alternative methods of anesthesia. For instance, intubating a patient with oropharyngeal lesions may be more challenging if there is physical obstruction of the airway or if friable tissue leads to bleeding. Similar to most other viral infections (e.g. SARS-CoV-2, human immunodeficiency virus), the benefits of neuraxial analgesia and anesthesia for labor and delivery likely outweigh the risk of CNS complications, although it may be necessary to avoid skin puncture in areas of active rash. It is important to consider the use of povidone-iodine for antiseptic skin and vaginal preparation in patients with widespread rash, given the risk of potentially fatal anaphylaxis following exposure of broken skin and mucosa to topical chlorhexidine.[8]

Anesthetists should refer to interim guidance on Mpox precautions, including enacting enhanced droplet precautions, consideration of negative pressure rooms for aerosol-generating procedures, and use of adequate personal protective equipment.[11] Clinicians must keep up to date on recommended guidelines for Mpox exposure in pregnant individuals, maintain suspicion of Mpox in those presenting with rash and lymphadenopathy, and ensure adequate precautions, including the use of personal protective equipment, are taken to prevent exposure while performing clinical duties.[7,12]

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Declaration of interests

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