Fetal ventriculomegaly and herpes encephalitis following primary maternal herpes simplex infection

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Uteroplacental transmission of a primary herpes simplex virus (HSV) infection in pregnancy has been reported; however, HSV ventriculomegaly of the neonate has not been well documented in utero. We present a case of a 19-year-old woman who developed a primary HSV outbreak at 17 weeks of gestation and was treated with acyclovir. A congenital malformation scan at 18 weeks of gestation demonstrated no fetal abnormalities; however, an ultrasound at 33 weeks showed a new finding of ventriculomegaly. Additionally, hydrocephalus was confirmed with magnetic resonance imaging. New-onset ventriculomegaly in the setting of primary HSV infection in pregnancy should be considered as an in utero diagnostic indicator of antenatal herpes simplex infection and herpes encephalitis.

Uteroplacental transmission of a primary herpes simplex virus (HSV) during vaginal delivery is well documented, and neonatal infection is well understood. Though rare, uteroplacental transmission of HSV infection during pregnancy has been reported to cause similar sequelae in the neonate; however, HSV ventriculomegaly of the neonate has not been well documented in utero.

CASE DESCRIPTION

A 19-year-old G3P1102 woman presented for prenatal care at 17 weeks and 5 days of gestation. Her past medical history was significant for methamphetamine abuse, tobacco abuse, and negative maternal Rhesus factor (1). Obstetric history included an uncomplicated spontaneous term vaginal delivery and an additional preterm delivery at 35 weeks, secondary to placental abruption with a positive urine drug screen for methamphetamine. The patient complained of painful lesions on her vulva during the initial prenatal visit and was subsequently diagnosed with a primary HSV infection. The patient was then started on acyclovir (200 mg taken by mouth 5 times daily for 10 days). Viral cultures were obtained and found to be positive for HSV-2. A subchorionic hemorrhage had been noted during a routine anatomy scan at 17 weeks of gestation.

Prior to the HSV outbreak, the patient had a normally appearing and normally growing male fetus at 17 weeks and 5 days and again upon follow-up at 25 weeks of gestation (Figure 1). A repeat ultrasound around 33 weeks of gestation revealed severe lateral ventricle dilation (Figure 2). She declined amniocentesis.

The patient presented with contractions and signs of active labor 2 days after the fetal abnormality was noted on the ultrasound, at 34 weeks and 1 day of gestation. As no herpetic lesions were present on a bright light exam, the infant was delivered vaginally at the request of the patient. Upon delivery, the infant had no respiratory effort and the Apgar score was 1 and 7 at 1 and 5 minutes, respectively. The infant was intubated and noted to have multiple skin lesions, which also cultured positive for HSV-2. Shortly after admission to the neonatal intensive care unit, the infant began to have seizures. Ultrasound and magnetic resonance imaging findings (Figure 3) of the neonate confirmed hydrocephalus with severe lateral ventricle dilation. The infant died on the fifth day of life within 6 hours of being withdrawn from respiratory support. The placenta was culture positive for HSV-2 and showed signs of acute chorioamnionitis.

DISCUSSION

As HSV infection becomes increasingly common in people of reproductive age, the rate of neonatal HSV exposure is likely increasing.
to increase. In an effort to prevent HSV transmission during delivery, patients have been widely counseled to consider a cesarean section instead of vaginal delivery. Prevention of intrauterine transmission of HSV to the fetus is not well understood. Alternatively, it is known that a primary HSV outbreak during pregnancy increases the transmission rate to the neonate and that a primary outbreak is linked to increased risk of perinatal morbidity (2). In this case, the standard of care regarding HSV in pregnancy was followed: the patient was given a course of acyclovir at the time of her primary HSV outbreak with plans to start suppression at 36 weeks (3). Sadly, in this case, the fetus developed multiple terminal complications from the in utero herpes infection, which included the discovery of fetal ventriculomegaly.

Complications related to HSV in pregnancy are both rare and serious. Rates of neonatal HSV from maternal-fetal transmission are approximately 31:100,000 births—a rate that includes the risk of herpetic meningitis contracted by infants exposed to HSV during vaginal delivery (4). Intrauterine or transplacental transmission of HSV to the fetus is even rarer, and what is known largely comes to us through case reports. Known complications of intrauterine HSV infection include seizures, lethargy, irritability, tremors, poor feeding, temperature instability, bulging fontanelle, chorioretinitis, microcephaly, microphthalmia, and hydranencephaly (5–7). Hydranencephaly is defined as the “absence of cerebral hemispheres, which have been replaced by fluid-filled sacs” (8). In this case, the infant was found to have hydrocephalus, “a condition marked by an exces-

Figure 2. (a) Left and (b) right lateral ventriculomegaly at 33 weeks of gestation.

Figure 3. Neonatal MRI confirming ultrasound finding of hydrocephalus.

sive accumulation of cerebrospinal fluid resulting in dilation of the cerebral ventricles and raised intracranial pressure” (8).

This case demonstrates that ventriculomegaly (hydrocephalus) is an additional finding of intrauterine transmission of HSV to the fetus. We speculate that the findings detailed in this case report may be explained, at least in part, by viral replication in brain tissue that mediated neural cell death and destruction, which led to late-presenting ventriculomegaly as a space-occupying effect. This is not an uncommon finding with other viral infections. However, ventriculomegaly had not been previously described in primary HSV infection. Based on our experience, we would recommend repeat cerebral imaging in the third trimester for patients with a known primary HSV infection.