Management and Prevention of Varicella-Zoster Virus Infection in Pregnancy: A Case Report and Review of the Literature

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Practice Points

- Contraction of varicella during the first 2 trimesters of pregnancy can lead to congenital varicella syndrome (CVS) in the newborn. The most common features of CVS include skin, neurologic, and eye defects.
- Contraction of varicella in the third trimester of pregnancy more commonly results in perinatal varicella, which requires the immediate intitiation of varicella-zoster immune globulin.
- Congenital or perinatal varicella can be associated with mortality in newborns. It also is important to recognize varicella-associated pneumonia in the mother.
- Dermatologists can aid in the prevention of varicella-zoster virus (VZV) infection during pregnancy by inquiring about VZV status, ordering serologic studies, and referring women of childbearing potential for possible vaccination.

Primary infection with varicella-zoster virus (VZV) during pregnancy can lead to devastating outcomes for both the mother and fetus. We describe a case of VZV infection in a pregnant woman who presented at 38 weeks' gestation. We also review the literature regarding management and prevention. Varicella-zoster virus–associated pneumonia in the mother is important to recognize. Outcomes in the newborn largely are dependent on gestational age at the time of infection. Prevention is paramount to management.

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Case Report

A 32-year-old pregnant woman presented at 38 weeks' gestation with tachycardia and a pruritic vesiculopapular eruption of 24 hours' duration. The patient denied fever, chills, shortness of breath, cough, chest pain, and contact with anyone who exhibited symptoms of illness. She also denied a history of primary varicella-zoster virus (VZV) infection and VZV vaccination. A skin examination demonstrated diffuse erythematous papules and a few small vesicles on the trunk and extremities. A scraping from the base of an intact vesicle yielded positive Tzanck smear results. A chest radiograph was negative, thus ruling out VZV pneumonia. The clinical findings and positive Tzanck smear results led to a diagnosis of primary VZV infection. Inpatient therapy was initiated and intravenous acyclovir (500 mg every 8 hours) was administered. Because a gynecologic examination revealed cervical dilation (3 cm) on admission, intravenous terbutaline was started to prevent labor in the setting of VZV. On her fourth day in the hospital, the patient gave birth

to a newborn without skin lesions. The child immediately was treated with varicella-zoster immune globulin (VZIG).

Comment

Cases of VZV during pregnancy rarely are described in the dermatology literature. As in our patient, the initial diagnosis often is made by a dermatologist. In the United States, 1.5 to 4.6 of 1000 women of childbearing age contract primary VZV.[1] Adults, including pregnant women, are 20 times more likely than children to die from VZV infection.[2] A prodrome of 1 to 4 days of fever, malaise, and myalgia typically precede a vesiculopapular eruption lasting 6 to 10 days. A Tzanck smear can narrow the differential diagnosis to herpes zoster, primary varicella, and herpes simplex virus. Patients are contagious until the lesions crust over.[3] The virus spreads via respiratory secretions, thus patients require proper isolation precautions. If VZV is contracted during the third trimester of pregnancy, the risk for maternal VZV pneumonia increases and is greatest in smokers and patients with more than 100 skin lesions.[4] A nonproductive cough appearing 2 to 5 days after the exanthem can progress rapidly to respiratory failure. Acyclovir reduces mortality related to VZV pneumonia nearly 4-fold.[5] Pregnancy loss is possible secondary to maternal sepsis or hypoxia.[6]

Varicella contracted during the first 2 trimesters can lead to congenital varicella syndrome (CVS), which can result in serious malformations, most notably skin lesions, neurologic defects, and eye diseases.[7] If a pregnant nonimmune woman is exposed to varicella, VZIG should be administered within 96 hours. If varicella develops in a pregnant woman, she can be treated with acyclovir.[8] However, neither treatment with VZIG nor acyclovir eliminates the risk for CVS. In 9 cohort studies that included a total of 1752 births, the incidence of CVS in the first, second, and third trimesters in pregnancies affected by varicella infection was 0.55%, 1.4%, and 0%, respectively.[8] In one prospective study following VZV during the first 16 weeks of pregnancy, the rate of spontaneous abortion was 3%.[9] Requirements for the diagnosis of CVS in a newborn include maternal VZV during pregnancy; congenital skin lesions in a dermatomal distribution; and neurologic, eye, and/or limb defects. Of the neonates born with CVS, nearly 30% have resulted in death within the first few months of life.[10] Intrauterine VZV exposure results in detectable viral DNA, specific IgM, and persistence of IgG beyond 7 months in the child. If intrauterine exposure is suspected during the first 20 weeks of gestation, close monitoring is initiated including amniocentesis at 17 to 20 weeks followed by repeated ultrasonography.[8] Maternal herpes zoster (shingles) has no known adverse effect on the fetus.[9]

If VZV is contracted during the third trimester of pregnancy, the infant is at increased risk for developing infection in the perinatal period, with greatest risk if the mother's exanthem appears from 5 days before to 2 days after delivery.[6] Infection appearing within 5 to 12 days of life has been associated with 23% mortality.[11] Because of increased mortality during the newborn period, intravenous VZIG is immediately administered to the newborn of an affected mother. A newborn with disease despite receiving VZIG is treated with intravenous acyclovir.[8] Susceptible newborns who are younger than 28 weeks or less than 1000 g in weight also should be administered VZIG regardless of the mother's status if exposed to VZV.[8]

Prevention can reduce these concerns from infection. Assessing the immune status in women of childbearing age and immunizing when appropriate is a first step.[6] The VZV vaccine is a live attenuated virus and is contraindicated in pregnancy given a paucity of data. The Centers for Disease Control and Prevention recommends that women do not conceive for at least 1 month after vaccination.[12] Vaccination can be administered postpartum and is compatible with breastfeeding.[13]

Conclusion

Cases of VZV infection during pregnancy are not represented in the dermatology literature. As demonstrated by our patient, it is prudent for dermatologists both in inpatient and outpatient settings to be aware of the evaluation, management, and consequences of VZV infection contracted during pregnancy and the perinatal period. Importantly, dermatologists can help aid in the prevention of VZV infection during pregnancy by inquiring about VZV status and ordering serologic studies, especially in patients who cannot recall having the virus or the vaccine. Depending on titer results, women can be directed to their primary care physicians for further evaluation and possible vaccination.

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