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Pregnancy Complicated by Listeriosis

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Listeria is commonly found in processed and prepared foods and listeriosis is associated with high morbidity and mortality. Pregnant women are at high risk of listeriosis, but the symptoms are non-specific and diagnosis is difficult. Here, we report a case of listeriosis complicating pregnancy and causing severe neonatal infection that was successfully rescued by antibiotic therapy. A 21-year-old pregnant woman (gravida 4, para 2, abortion 1) presented at 35 weeks' gestation with abdominal pain and fever. She came to our hospital due to regular uterine contractions and fever. While the cause of her fever was being investigated, continuous fetal heart rate monitoring showed persistent fetal tachycardia. However, she delivered the baby vaginally two hours after admission. A female baby was delivered, weighing 2328 g, with Apgar scores of 1, 6 and 7 at 1, 5 and 10 minutes, respectively. After birth, the infant was flaccid and cyanotic without respiratory activity. She was intubated and received mechanical ventilation and empirical antibiotic treatment with Ampicillin and Cefotaxime. Persistent pulmonary hypertension developed and high frequency ventilation with inhalated nitric oxide was given. *Listeria monocytogenes* was isolated from the blood culture. After treatment, her condition gradually improved at the 15th day. However, the next day her respiratory condition deteriorated and she was intubated again. Antibiotics were shifted to Vancomycin and Meropenem. Caspofungin was also prescribed due to possible fungal infection. After a 14-day course of treatment, she was discharged on the 45th day after birth. Neonatal listeriosis often causes neonatal death. Ampicillin is the first treatment of choice for listeriosis and can significantly improve neonatal outcome. Pregnant women are advised to take additional precautions while consuming and handling foods. Obstetricians should be also familiar with this life-threatening disease.

Key words: *listeria monocytogenes*, listeriosis, pregnancy, neonate

INTRODUCTION

Listeria is commonly found in processed and prepared foods and listeriosis is associated with high morbidity and mortality. However, infection with *Listeria monocytogenes* is rare. It occurs more commonly in pregnant women than in nonpregnant women, with an incidence of 12 / 100,000 pregnant women.[1] This infection is particularly dangerous to pregnant women and may result in miscarriage, preterm delivery, generalized sepsis, and fetal and neonatal infection.[2] Maternal and fetal outcomes are generally worse if the infection occurs late in gestation.[3]

This article describes a case of listeriosis complicating pregnancy and causing severe neonatal infection that was successfully treated with antibiotic therapy.

CASE REPORT

A 21-year-old pregnant woman (gravida 4, para 2, abortion 1) presented at 35 weeks' gestation with abdominal pain and fever. She received a regular prenatal check up at another hospital. Hepatitis B, syphilis, rubella, and human immunodeficiency virus work were all normal. However, intermittent fever and dyspnea had been noted since the first prenatal check up.

She came to our hospital due to regular uterine contractions and fever. The vital signs revealed a body temperature of 38.8 °C, pulse rate of 130 beats per minutes (bpm), and blood pressure of 150/65 mmHg. While the

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cause of her fever was being investigated, continuous fetal heart rate monitoring showed persistent fetal tachycardia (180 bpm). The complete blood count revealed white blood cells 10440/ul, hemoglobin 9.6, and platelet 280,000/ul. However, her labor course progressed soon after and she delivered the baby vaginally two hours after admission. A female baby was delivered, weighing 2328 g, with Apgar scores of 1, 6 and 7 at 1, 5 and 10 minutes, respectively. The placenta weighed 550 g, appearing grossly normal.

The mother's blood culture and urine culture revealed no bacterial growth. The woman's temperature returned to normal within 24 hours. She was discharged on the third day after delivery. The woman reported she did not recall eating raw foods or improperly handling any foods.

After birth, the infant was flaccid and cyanotic without respiratory activity. A thick meconium stain covered her whole body. After resuscitation, she was intubated and received mechanical ventilation in the neonatal intensive care unit. Her chest X-ray showed bilateral pneumonitis and her laboratory exams showed leukopenia with left shift, elevated C-reactive protein, disseminated intravascular coagulation, and respiratory acidosis. Under the impression of neonatal sepsis with meconium aspiration syndrome, empirical antibiotics with Ampicillin (YF Chemical Co., Taiwan) and Cefotaxime (Patheon, UK) were prescribed. Persistent pulmonary hypertension developed two days later. High frequency ventilation with inhaled nitric oxide was given. *Listeria monocytogenes* was isolated from the blood culture. After treatment, her condition gradually improved, except for the cholestatic liver disease. Follow-up chest X ray revealed improved lung condition, and we then extubated on the 15th day after birth.

However, her respiratory condition deteriorated on the next day, and then, she was intubated with mechanical ventilation again. Chest X-ray showed bilateral white out lung lesions. Oral candidiasis was also found. Antibiotics were shifted to Vancomycin (Invida, Taiwan) and Meropenem (Dainippon Sumitomo, Japan). Caspofungin (MSD, Taiwan) was also prescribed due to possible fungal infection. After a 14-day course of treatment, her respiratory condition had improved and she was discharged on the 45th day after birth.

DISCUSSION

Listeria monocytogenes is 18 times more common in pregnancy (12/100,000) than in the non-pregnant population (3.1/1,000,000),[4] and 16-27% of all infections with Listeria occur in pregnant women.[2] Underlying maternal risk factors are uncommon (4.5%) and serious maternal disease is rare when other risks are absent.[5] In Taiwan, there have been seven case reports (including this one) since 1990 till now.[6] Most cases have a gestational age between 28 and 35 weeks. For the neonatal outcome among these cases, two cases expired, three cases were discharged after 60 days, our case was discharged after 45 days, and one case was discharged after only 14 days. Prenatal treatment with antibiotics is associated with the best outcome in newborns.

In most cases of maternal listeriosis, the illness is mild and may be asymptomatic.[2,7] Fever and flu-like symptoms are the most common presenting symptoms.[2,7] Preterm birth is common,[2] and the highest mortality rate is predictably among infants born in the earliest gestations.[8]

Diagnosis of maternal listerial infection may be difficult due to the lack of GI symptoms normally associated with food-borne pathogens and non-specific symptoms of malaise and influenza. The definitive diagnosis is made from the results of blood cultures. The prevention recommendation is all deli meats be consumed safely if reheated until steaming hot.[9] Besides, these measures should also be taken in retail environments and for foods such as melons and hummus, which are not commonly recognized as high risk. Because of the severity of listeriosis, pregnant women and other persons at risk may wish to avoid eating these newly implicated foods.[10] Ampicillin is the drug of choice for treating listeriosis.[11] For patients allergic to penicillin, erythromycin or vancomycin can be used.

While maternal illness "due to listeriosis" may be mild, the consequences of neonatal infection are severe, with a mortality rate of 25%-50%.[12] Neonatal listeriosis may occur by vertical transmission through inhalation of infected amniotic fluid, or transplacentally from the maternal circulation.[13] Early and late forms of neonatal listeriosis have been described.[2] Early-onset listeriosis develops at a mean of 36 h after birth, and most infants show signs of sepsis.[2] Neonates with early-onset infection are more frequently born preterm and associated with chorioamnionitis. A rare severe form of early-onset listeriosis, known as granulomatosis infantisepticum, is characterized by disseminated granulomatous lesions with the formation of microabscesses.[1] In contrast, late-onset listeriosis generally occurs more than 7 days after birth, typically in term neonates, and most infants (94%) present with meningitis. Neonatal listeriosis is one of the few congenital infections in which the outcome can be improved by antibiotic therapy.[14]

Ampicillin combined with an aminoglycoside is the preferred management of neonatal listeriosis.[2] If the neonate does not respond within a few days, the addition of rifampicin, moxifloxacin or trimethoprim–sulfamethoxazole may be considered, depending on the sensitivity.[2]

Listeriosis may be life-threatening to the fetus and neonate. However, diagnosis of maternal infection is difficult. Obstetricians should have a high index of suspicion of this disease when encountering antepartum maternal fever and unspecified flu-like symptoms. A blood culture should be obtained. Ampicillin is given prophylactically to reduce perinatal infection.

DISCLOSURE

All authors declare no competing financial interests.

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