In utero transmission of influenza A H1N1

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The influenza A pandemic H1N1 was first detected in the USA in April 2009. It is associated with a high risk of complications in pregnant women and children. Transplacental infection of influenza A is rare. We report a case of *in utero* transmission of influenza A H1N1 infection in a newborn whose mother was seriously ill with influenza A H1N1 during the perinatal period. Our patient was probably infected *in utero* because he was delivered by caesarean section and was never exposed to his mother, who required intensive cardiopulmonary support at the time of delivery.

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Influenza A H1N1 infection is a very serious condition, especially in pregnant women and children.[1] Vertical transmission of influenza A H1N1 virus has been suspected in some cases but definitive evidence was not available.[2] We report a case of *in utero* transmission of influenza A H1N1 infection.

Case

A preterm baby was born by emergency cesarean section at 34 weeks' gestation, to a 38-year-old mother with dilated cardiomyopathy complicated by an arrhythmia and who consulted for acute distress respiratory syndrome (ADRS). The diagnosis of influenza A H1N1 was immediately suspected and confirmed by multiplex reverse transcription polymerase chain reaction (RT-PCR) of the throat swab specimen. The episode occurred during the Tunisian influenza season and the mother had nasopharyngeal symptoms suggestive of influenza A1 H1N1 infection. The newborn's Apgar scores were 7 and 8 at 1 and 5 minutes, respectively. He was small for his gestational age, with a weight of 1 880 g, and had a head circumference of 29 cm. Based on the perinatal history, the newborn was admitted to the neonatal intensive care unit and isolated from other babies in an incubator. He presented with a transient tachypnoea during the first two hours of life. Procalcitonin and C-reactive protein (CRP) assays were negative. Blood culture was negative. The specimen obtained from the throat swab was positive for influenza A H1N1 virus by real-time RT-PCR.

Therefore, 4 mg oseltamivir was administered to our patient every 12 hours (1.5 mg/kg/12h). The infant was probably infected *in utero* because he was delivered by cesarean section and was never exposed to his mother, who required intensive cardiopulmonary support at the time of delivery. The mother died from respiratory failure 10 days after the caesarean section.

The outcome for our patient was favourable. The newborn was discharged from hospital on day 13 of life.

Discussion

Our newborn's mother was critically ill and she died on day 10 after delivery. Pregnant women are one of the highest risk groups for influenza A infection and influenza-associated complications, including increased maternal and perinatal illness and death rates.[3] Severely ill or perimortal women, defined as women who are admitted to an intensive care unit or who ultimately die, have an increased risk of adverse infant outcomes.[4]

Our patient was born prematurely; he was small for gestational age and remained asymptomatic, other than transient tachypnoea of the newborn, until discharge. Among reported cases of infants born to women who have delivered while hospitalised for 2009 H1N1 illness, 63.6% (95% confidence interval (CI) 51.8 - 74.3) were born preterm (compared with 12.3% of all USA births), 69.4% (95% CI 57.5 - 79.8) were admitted to a neonatal intensive care unit (compared with 6.1% of all USA births), and 29.2% (95% CI 19.1 - 41.1) had 5-minute Apgar scores that were ≤6 (compared with 1.6% of all USA births).[5]

Infants born to women who had been hospitalised for respiratory illness during the influenza season at any time during pregnancy were more likely to be small for gestational age than infants born to women who were not hospitalised.[5]

Viraemia is more frequent and more extensive in pregnant women due to depressed cell-mediated immune response during the pregnancy.[6] When pregnant women are infected by influenza A H1N1 during the perinatal period, newborns can be infected by respiratory droplets after birth or, more rarely, transplacentally during maternal viraemia,[7] although there have been few case reports in this regard.[1]

Our patient was delivered by an emergency caesarean section and he was never exposed to his mother, who required intensive cardiopulmonary support at the time of delivery. Therefore, we presume that the transmission was transplacental. Oseltamivir was administered to our patient with a dose of 3 mg/kg/day. The outcome for our patient was favourable. The newborn was discharged from hospital on day 13 of life. This suggests that early treatment with oseltamivir can prevent severe illness in newborns with perinatal influenza A H1N1. The World Health Organization issued a statement allowing the use of oseltamivir in newborns <14 days old for the treatment of suspected or confirmed influenza, at a dose of 3 mg/kg/day.[8] Influenza vaccination during pregnancy

is a key strategy to prevent influenza and influenza-related complications in pregnant women and their infants. Indeed, it has been established that influenza vaccination during pregnancy decreases the frequency of influenza or its complications in infants up to 6 months old.[5]

Conclusion

The prenatal transmission of influenza A H1N1 should be considered in infected pregnant women. Thus, preventive treatment should be prescribed to avoid neonatal complication.

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