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Newborns of H1N1 Positive mothers: a favorable outcome

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Abstract

We report two cases of neonates admitted to the neonatal intensive care units of a teaching hospital in Northern India with mothers testing positive for H1N1 viral infection, and discuss their management and outcomes. Both babies were delivered premature by cesarean section, had perinatal asphyxia and had respiratory failure requiring mechanical ventilation. Empirical antibiotics were promptly initiated and timely stopped when sepsis was ruled out. Both neonates recovered after antiviral therapy specific for H1N1 virus and discharged from hospital after 32 and 12 days, respectively. There was no outbreak of the respiratory infections in the neonatal unit during their admissions.

Keywords: Influenza A, H1N1 infection in mothers, Prematurity, Respiratory distress, Oseltamivir

Introduction

Pregnant women and their fetuses are at high risk of infection with the novel H1N1 influenza A virus. Obstetrics providers need to be prepared to provide the care necessary to address the increased morbidity, mortality, and pregnancy-related complications (including spontaneous miscarriage and preterm birth) faced by pregnant women during an influenza pandemic. Human infection with the novel H1N1 strain of the influenza A virus (formerly called *swine flu*) was first identified in April 2009.[1,2] The outbreak has since reached pandemic status. Pregnant women are at especially high risk for the development of complications of H1N1 influenza A.[2,3,4,5] During pregnancy, healthy women have a 4 to 5 fold increased rate of serious illness and hospitalization with influenza.[6]

A large case series of hospitalized pregnant women with H1N1 infection showed that 57% of neonates were admitted to neonatal intensive care unit (NICU).[7] We report 2 cases of neonates born to H1N1 positive mothers who became severely ill during the perinatal period. Babies were delivered by caesarean sections and received intensive neonatal care including ventilator support and Oseltamivir treatment. Both the babies were discharged from hospital after 30 and 12 days of hospital stay, respectively. The impact of H1N1 on the newborn is unknown, but based on isolated reports,[8,9] newborns are expected to be at increased risk of severe illness.

Case Report

Patient A: A 28 years old lady, resident of Muktsar (Punjab) was a G2P1L1 patient with a single live issue born by vaginal delivery 4 years back, now presented at 27+5 weeks gestation and was diagnosed with H1N1 infection. Patient had fever, cough, and breathlessness for 10 days prior to admission. She had received Oseltamivir for 7 days and a female baby was delivered vaginally on 19th December, 2015 at 8:10am with a birth weight of 970 gm. Liquor was not meconium stained. There was no cry at birth, HR <60/min, CPR started, intubated with endotracheal tube no.2.0 fixed at 6.5cm and given bag and tube ventilation, HR>100/min, spO2 90% and baby shifted to NICU for intensive neonatal care. APGAR score was 5 at 1 min and 7 at 5 minutes.

Baby was given surfactant as early rescue therapy @5ml/kg and put on ventilator support. Baby was extubated within 24 hours and put on nasal bubble CPAP. Initial sepsis screen of baby came out to be positive and she was started on IV antibiotics (Cefotaxime and Amikacin) and IV fluids. In view of positive maternal history of H1N1 positivity and persisting respiratory distress in baby, a 2nd dose of surfactant was administered @5ml/kg and baby started on oral Oseltamivir. Lumbar puncture done on day 3 to rule out meningitis came out to be negative. Baby was reintubated on day 4 of life as respiratory distress persisted and chest X ray worsened showing bilateral infiltrates. Repeat sepsis screen was again positive so IV antibiotics were hiked up to Meropenem and Vancomycin. Gradually baby was weaned off from ventilator and extubated on day 7 of life and put on CPAP which was gradually weaned off. Falling platelet count was seen on day 8 and was supported with one unit of RDP at a count of 42000/cumm, and thereafter showed a rising trend. One unit of packed cell was transfused at an Hb of 8.3 gm/dl. Antibiotics were stopped after 14 days.

Baby had a systolic murmur on examination. ECHO done was suggestive of localized coarctation of aorta and a small sized PDA (left to right shunt). Review ECHO done at day 29 of life showed localized coarctation of aorta with closed PDA. Patient remained asymptomatic throughout hospital stay.

In view of prematurity, ROP screenings were done twice during hospital stay, and last screen showed Zone 2a and 3 immature with no preplus disease.

At time of discharge baby had no respiratory distress, was on intermittent oxygen support with nasal prongs, and was accepting spoon-feeds well. Neurological examination at time of discharge was grossly normal. Last investigations showed normal renal parameters, CRP, Hb and platelet count. Baby was discharged after 32 days of hospitalization and weight at discharge was 1280 gm.

Patient B: A 36 year old lady, resident of Bathinda, a fourth gravida mother with 2 previous live issues, both born by vaginal delivery, and a spontaneous abortion 3 years back, at 36 weeks gestation had fever, cough for 15 days prior to admission and was treated with home isolation and Oseltamivir for 8 days. At admission, there was oligohydramnios with fetal distress requiring emergency caesarean section which was performed under general anesthesia. Patient also had severe MS, shock and renal failure. Cesarean section was conducted in a separate designated operation theatre. The liquor was thick meconium stained.

A 2100 gm male baby was born on 16th January, 2016 at 5:20 pm. Baby had no cry at birth with HR <60/min, intubated with endotracheal tube no. 3 and tube withdrawn with continuous suction for meconium aspiration three times. Patient reintubated with ET no.3 fixed at 8.5cm, CPR started, Injection Adrenaline and Naloxone given for resuscitation. HR became >100/min and then the baby was shifted to NICU for further intensive neonatal care. APGAR score was 3 at 1 min and 5 at 5 minutes indicating severe perinatal asphyxia.

Baby was immediately put on mechanical ventilation and started on IV antibiotics (Cefotaxime and Amikacin), oral Oseltamivir and IV fluids. Initial sepsis screen was negative. In view of hypotension (low MAP on IBP records) and poor peripheral perfusion baby was started on inotropic support with Dopamine and Dobutamine infusions via umbilical venous catheter. Baby had oliguria initially followed by anuria for 12 hours. Investigations sent revealed deranged renal function tests, rising creatinine, severe metabolic acidosis. Amikacin was stopped and peritoneal dialysis started, given 34 cycles after which an improvement was seen in acidosis, urine output and serum creatinine levels. Falling platelet count was seen on day 3 and was supported with one unit of RDP at a count of 37000/cumm, and thereafter showed a rising trend.

Sepsis screen sent on day 5 came out to be positive but IV cefotaxime was continued as baby showed clinical improvement and stopped on day 10. BAL (bronchoalveolar lavage) sample was sent for RT-PCR for detection of H1N1 virus which came out to be negative after 5 days and Oseltamivir was stopped. As baby showed clinical improvement, inotropes were tapered gradually and was weaned off from ventilator and extubated on day 8 of life and put on nasal CPAP which was gradually weaned off. Post extubation baby was stated on spoon-feeds which were taken well. At time of discharge baby had no respiratory distress, was off oxygen support, maintaining well on room air and was accepting spoon-feeds well. Neurological examination at time of discharge was normal. Last investigations showed normal blood urea, creatinine, electrolytes, CRP and platelet count. Baby was discharged after 12 days of hospitalization and weight at discharge was 2520gm.

Discussion

H1N1 influenza has been identified as a cause of febrile respiratory infection worldwide. In India, the highest number of cases was reported in 2009 (27,236), followed by 2010 (20,604) and 2012 (5,054 cases). The highest number of swine flu deaths took place in 2011 (1,763), followed by 2009 (981) and 2012 (405).[10] However, these statistics do not estimate the overall health impact of influenza on pregnancy.

Pregnancy does not predispose women to an increased risk of acquiring influenza infection. However, pregnant women are at increased risk of morbidity and mortality as compared to women who are not pregnant.[11,12,13] This is due to the changes in their immune systems to accommodate the developing fetus and adaptations in body as a result of the hormonal and physical changes.[14]

Other factors such as family commitments, lack of awareness, and gender discrimination have been identified to cause delay in seeking health care. These factors along with the physiological changes have an impact on outcome of H1N1 infected pregnant women in low income nations.[15]

Intrauterine infection of the fetus is potentially possible from the maternal influenza viremia and influenza has rarely been detected in vaginal secretions, but it is most likely that the infant will be infected postnatally by the respiratory route.[16] Risk of transmission of H1N1 from mother to fetus is unknown; the newborn should be considered to be potentially infected if delivery occurs during the 2 days before through 7 days after illness onset in the mother.[16] Our patients were unlikely to be infected because they were delivered by cesarean section and were never exposed to the respective mothers, who unfortunately required intensive cardiopulmonary support after delivery and expired the next day. Placental examination for viral studies would have given promising clues regarding route of transmission but was not done in our case, which is the limitation in this case. Suspected transplacental transmission of the H1N1 virus has been reported.

Data on treatment of newborn infants with H1N1 virus infection are limited. However, newborn infants with severe or deteriorating illness should be treated. Oseltamivir 3 mg/kg/dose once daily for 5 days to newborn infants younger than 14 days and 3

mg/kg/dose twice daily for 5 days to newborn infants older than 14 days is recommended.[17] Women can continue breast feeding while following appropriate infection control measures like hand hygiene, use of face mask and observation of respiratory hygiene/cough etiquette guidelines. Newborn babies should be roomed-in with mothers even if the mother has H1N1 infection. This is especially important in developing countries. Currently, there is no evidence that the potential risk of newborn infection with pandemic H1N1 outweighs the risk that would result from separating the baby from the mother and from not being breastfed.[17]

Pregnant women merit priority vaccine administration. H1N1 adjuvant vaccines are safe for pregnant women as recommended by World Health Organization (WHO). H1N1 positive newborns need close monitoring, breast feeding can be encouraged and the infected infants can be treated safely with Oseltamivir in recommended doses.[17]

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