

SEVERE ARDS DUE TO INFLUENZA A (H₁N₁) PDM09 INFECTION DURING PREGNANCY FOLLOWED BY INTRAUTERINE FETAL DEATH AT ALKA HOSPITAL, LALITPUR

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ABSTRACT

Pandemic due to Influenza A (H1N1) pdm 09 has been a significant cause of morbidity and mortality worldwide. Pregnant women are at risk of severe disease and ARDS, with rapid progression of disease. There is increased risk of fetal loss. Little evidence exists regarding the management of ARDS in pregnancy. Here we report a case of H1N1 virus infection in a pregnant woman in third trimester complicated by severe ARDS and intra-uterine fetal death. Fetus was successfully expelled using vaginal Misoprostol, which was followed by improvement in oxygenation indices. However, the patient died of refractory hypotension. Influenza vaccination in the high risk population may be invaluable.

KEY WORDS

Influenza A (H₁N₁) pdm09 infection, intra-uterine fetal death, pregnancy, severe ARDS

Citation

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INTRODUCTION

Influenza A (H1N1) pdm09 pandemic has claimed many lives since it was first noticed in Mexico during April 2009.¹ In contrast to seasonal influenza epidemics, during which elderly persons are commonly involved, many critically ill patients affected by H1N1 were young or middle aged adults. Severe acute respiratory distress syndrome (ARDS) often developed very quickly and was frequently associated with protracted course and high mortality. Pregnancy, morbid obesity and early postpartum period were significant risk factors. Pregnant women represent 6 to 10% of the total mortality.² About 30% of patients develop septic shock and refractory hypotension requiring high-dose vasopressor support.³

Little evidence exists regarding management of ARDS specifically in pregnancy. Treatment approaches are extrapolated from studies performed in general population.⁴ Pandemic influenza virus infection in pregnancy is associated with increased risk of fetal death.⁵ There is scarce experience about management of pregnant patient with severe ARDS complicated by intra-uterine fetal death (IUFD). To the best of our knowledge, this is the first report of such kind from Asia.

CASE REPORT

A 32 years old lady at 32 weeks of gestation, presented with the history of fever, cough, rhinorrhoea and myalgia of 2 days duration. She had no previous medial illness and was on regular antenatal visits, which revealed uneventful pregnancy. She had no history of influenza vaccination. Laboratory reports revealed leukocytosis with white cell count of 20,500/cu mm with 90% neutrophils. She was initially managed with the suspicion of community acquired pneumonia. Fetal assessment by ultrasonography revealed normal fetal cardiac activities. During the second day of hospital stay, she progressively became tachypnoic with progressive fall in oxygen saturation. She required intubation and mechanical ventilation. She progressed to refractory hypoxemia, requiring positive end-expiratory pressure (PEEP) of 20 cm of H₂O at oxygen fraction (FiO₂) of 100% to maintain oxygen saturation of 88% or more. Her PaO₂/FiO₂ was 58 mm Hg. Ventilatory setting was adjusted to deliver tidal volume of 6 ml/kg predicted body weight (PBW) and plateau pressure of 30 cm of H₂O or less. Respiratory rate was adjusted to keep pH of 7.30-7.45. Chest radiograph revealed bilateral diffuse pulmonary infiltrates. Bedside echocardiography was normal. Empirically, oseltamivir 75 mg was administered immediately followed by twice daily administration. Gram staining of lower respiratory sample revealed gram positive cocci in pairs. Antimicrobial coverage was upgraded to meropenem 1 gm 8 hourly. Real time polymerase chain reaction (PCR) was positive for Influenza A (H1N1) pdm09.

Subsequent obstetric ultrasonographic evaluation revealed loss of fetal cardiac activity suggestive of intrauterine fetal death. Misoprostol 300 µg was placed in the posterior fornix

of vagina to induce labour to terminate pregnancy. It was supplemented with infusion of Oxytocin. There was progressive effacement of cervix. But over the following hours, patient progressively developed hypotension, unresponsive to fluid boluses. She was started on noradrenaline and dobutamine infusion to keep mean arterial pressure (MAP) more than 65 mm Hg. She had an episode of bradycardia followed by cardiac arrest. Following cardio-pulmonary resuscitation (CPR) with manual left uterine displacement, return of spontaneous circulation (ROSC) was attained after 3 minutes. In the next hour, around 10 hours following induction of labour, the dead fetus was expelled. There was significant improvement in oxygenation with decrease in requirement of PEEP to 15 cm of H₂O and FiO₂ to 80%. Her hypotension worsens requiring additional support with Vasopressin. After 30 minutes, she had another episode of cardiac arrest. Despite 30 minutes of CPR, patient could not be revived.

DISCUSSION

Pregnancy, especially in the second and third trimester, is an important risk factor for severe H1N1 virus infection. Although pregnant women represent only 1 to 2% of patients with H1N1 infection, they account for upto 7 to 10% of hospitalized patients. Risk of death is highest during third trimester.² Pregnancy related reduction in IFN-β and TGF-β expression and elevation of pro-inflammatory cytokines could be the reason for higher severity of infection and mortality.⁶

Lung protective ventilation strategy was employed to minimize ventilator-associated lung injury, which demonstrated a significant reduction in mortality in patients with ARDS. Unfortunately, pregnancy was an exclusion criteria in the study.⁷ Early administration of oseltamivir is associated with significant reduction of risk of death. So it was administered empirically awaiting reports.⁸ Vaginal misoprostol was successfully used for expulsion of fetus after IUFD.⁹

During the first cardiac arrest, ROSC was attained following CPR with left uterine displacement to minimize aortocaval compression. Emergency caesarean section was not performed as the ROSC was attained within 4 minutes.¹⁰ Despite improvement in oxygenation after expulsion of the fetus, patient could not be revived during the second cardiac arrest. Influenza vaccination of pregnant women reduces the risk of influenza diagnosis and may reduce the risk of influenza-related death.⁵

CONCLUSION

Influenza A (H1N1) pdm09 infection during late pregnancy carries significant risk of severe infection, progression to ARDS and detrimental fetal outcome. Vaccination during pandemics, early hospitalization, early administration of Oseltamivir and aggressive supportive care can potentially improve outcome.

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