

Case Reports

Neonatal COVID-19 in A Tertiary Care Hospital of Chattogram: A Case Report

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Abstract

Coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), emerged in China in December 2019 and now has led to a global pandemic. The incidence is lower in neonates. A five days old newborn infant got admitted with history of reluctance to feeding and less movement. On admission, the newborn infant was found to be lethargic, icteric, tachypnoeic, afebrile with SPO₂ of 90% throughout his hospital stay. Chest x-ray was normal but RT-PCR for COVID-19 was positive. His mother had symptoms of COVID-19 with positive RT-PCR. The neonate was isolated and was treated with antibiotics along with supportive care, then improved gradually and was discharged on day 10 of his age. Suspicion about COVID-19 in newborn infants with prompt identification is essential to limit its transmission in the community.

Keywords: Newborn infant, COVID-19, SARS-CoV-2, RT-PCR.

Introduction

The novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is responsible for coronavirus disease 2019 (COVID-19) and has become a pandemic.^{1,2} The virus was first identified in December 2019 in Wuhan situated in China. On 8th March 2020, the first case of COVID-19 was detected in Bangladesh. Since then, there has been a rapid increase in the number of cases over past few months. On 13th July 2020, there were 952947 confirmed cases and almost 2391 deaths in Bangladesh.³ Out of confirmed cases 2.7% were less than 10 years of age.³ Although COVID-19 can affect all age groups, the disease is usually milder in children than in adults, and may be accompanied by non-specific symptoms, especially in neonates.⁴ At present, data on neonatal

COVID-19 are relatively scarce. There are many unanswered questions on disease characteristics of COVID-19 in this population. In Bangladesh, case reports on neonatal COVID-19 are unremarkable. The case is presented here with a view to orient health personals particularly pediatricians and neonatologists regarding likelihood of the disease in newborn infant presenting with nonspecific clinical manifestations along with outline of management.

Case report

A five days old male newborn infant presented to Special Care Newborn Unit (SCANU) of Chattogram Medical College Hospital (CMCH) on 7th July, 2020 with history of premature birth, poor feeding, lethargy and yellow coloration of body for 2 days. The newborn infant was delivered by emergency lower uterine caesarian section due to severe preeclampsia at 35 weeks of gestation with birth weight of 2000gm. He breathed spontaneously and resuscitation was not needed. He was kept with his mother in postnatal ward of Gynaecology and Obstetrics Department of CMCH and was on exclusive breast feeding.

On second day after delivery, the mother became febrile with respiratory symptoms. History of previous existing infection or risk factors of infection was absent. History of contact with known COVID-19 patients

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during this pandemic situation was not found. Other family members were in good health. A nasopharyngeal swab specimen was collected from mother on fourth postpartum day for COVID-19 by real-time reverse transcription polymerase chain reaction (RT-PCR) at Chittagong Medical College (CMC) Microbiology laboratory. Her RT-PCR report was positive. The newborn infant was with his mother and was not separated from his mother until he developed jaundice, reluctance to feed with decreased activity on fifth postnatal day. History of fever, rhinorrhea, gastrointestinal symptoms was absent in the infant.

The infant was referred to Special Care Newborn Unit (SCANU) of CMCH. After admission, by couples of hours the infant was normal in color and temperature but was lethargic with respiratory rate of 70/min, heart rate of 166/min, icterus up to leg, capillary refill time <3 sec and SpO₂ 90% with supplemental oxygen. On auscultation, there was no added sound over lung fields and murmur was not audible on precordium. Other physical findings were also normal. A provisional diagnosis of neonatal sepsis with neonatal COVID-19 as differential diagnosis was considered. The infant was kept in an isolated room with facilities of essential care by the side of SCANU in the Department of Neonatology. Separate service providers were allocated and visitor was restricted. The initial total count of WBC was 10,800/mm³ with neutrophil-64%, lymphocytes-30%, platelet count-260,000/mm³, hemoglobin-15.2gm/dl. CRP(C-reactive protein) was 24 mg/dl, procalcitonin was 0.385 ng/ml and blood culture for microbial growth was negative. His serum bilirubin was 17.38mg/dl (direct-0.6 mg/dl, indirect-16.8 mg/dl) but serum calcium, electrolytes and blood glucose were normal. Chest x-ray showed no abnormality. Nasopharyngeal swab was obtained for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by RT-PCR on sixth (6th) postnatal day which was found to be positive.

Treatment was started empirically with antimicrobials ceftazidime and amikacin along with general measures. Oxygen was given and phototherapy was started. After 24 hours, the neonate improved clinically. Respiratory support was discontinued and oral feeding was started with expressed breast milk. Phototherapy was given for 72 hours and antibiotics were continued for 5 days. The newborn infant was discharged from hospital on same day when he could maintain normal vital sign and feeding was established. Appropriate

advice of home care, meticulous hand hygiene of care givers and importance of follow up visit was given. The newborn was maintaining normal clinical parameters and thriving well at two weeks follow up visit. His RT-PCR for COVID-19 that was repeated on 14th day after the first test was negative. The mother was under treatment in COVID ward till that time and her baby unfortunately was on formula feeding.

Discussion

Infants and children are affected by this virus usually with a history of exposure to a patient of COVID-19. The median incubation period is five days with a range of two to 14 days.⁵ Despite COVID-19 being the cause of pandemic in 2020, and thus affecting a large population worldwide, very few studies have been published on neonate to understand its pathophysiology, management and outcome.^{4,6-12} All age groups are susceptible to COVID-19 but children seem to have less severe clinical symptoms if infected,¹³ but the potential harm of the disease remains largely unknown in neonates, especially in preterm infants. Immature immune system in children may respond to SARS-CoV-2 differently than adults. This may be responsible for less damaging cytokine reaction. The SARS-CoV-2 binds to angiotensin converting enzyme-II (ACE-2) receptors on type II alveolar epithelial cells in the lower respiratory tract to gain entry into the lungs,¹⁴ and ACE-2 receptors may be functionally immature in children including newborn infant making them less susceptible to SARS-CoV-2 infection.¹⁵ The ACE-2 is also located in gut, oral cavity, heart, kidney, testis etc¹⁶ and may lead to organ specific symptoms. Neonates tend to have more severe disease than older children.¹⁷⁻²⁰ Recent literatures showed some prognostic differences within pediatric population, where being a neonate was associated with increased likelihood of admission to intensive care unit.^{21,22}

Presentation of COVID-19 in children and neonates can range from asymptomatic infection to severe respiratory distress.⁴ History and symptoms associated with neonatal population include prematurity, known contacts with sick patient, temperature instability, respiratory symptoms (congestion, tachypnea, grunting, respiratory distress, apnea), lethargy, poor feeding, vomiting, and diarrhea.¹⁷ In this report, a case of neonatal SARS-CoV-2 infection is presented on day 5 of life with symptoms like tachypnoea, lethargy, poor feeding

which are consistent with several published works. Fever and gastrointestinal symptoms appears to be the leading presenting symptoms of COVID-19 in a majority of the neonates reported so far,^{6,9,10,12} though the present case was afebrile throughout the period of hospitalization and the neonate did not have any gastrointestinal symptoms.

Laboratory abnormalities seen in COVID-19 patients include normal or reduced white blood cell count, with decreased lymphocyte, normal or increased C-reactive protein (CRP). Procalcitonin (PCT) is normal in most cases. The level of PCT >0.5ng/mL indicates co-infection with bacteria. Elevation of liver enzymes, muscle enzymes and myoglobin, increased level of D-dimer might be seen in severe cases.¹³ Chest x-ray findings are variable and nonspecific including unilateral or bilateral ground-glass opacity, lobar or sub-segmental areas of consolidation, pneumothorax and sometimes normal.¹⁸ The present neonate shows normal total and differential white blood cell count with raised CRP(24mg/L), normal procalcitonin and normal chest x-ray. These findings are consistent with findings of Ligura I et al.²³ where acute phase reactants show raised in raised. In contrast Aghdam MK et al.⁹ found completely normal laboratory findings.

The mother of this patient developed COVID-like symptoms on second day of her delivery. Her nasopharyngeal swab RT-PCR is positive for COVID-19 on fourth postnatal day. As the infant became symptomatic on fourth day, he was tested for COVID-19 with nasopharyngeal swab on sixth day with a positive result. There is no evidence that this infection can be transmitted through breast milk.¹⁹ Though proper infection prevention procedures are routinely followed during lower uterine caesarian section (LUCS) in this hospital, it is unclear whether such measures were carried out during handling of the present case. Here, possibility of nosocomial transmission cannot be ruled out. But as the majority of the reported cases are due to horizontal spread and the mother is COVID-19 positive, this might be a case of horizontal transmission. Although previous data suggesting possibility of vertical transmission is equivocal,^{8,19,20} reports suggesting evidence of vertical transmission have been published.^{24,25} Vertical transmission is confirmed by comprehensive virological tests in the placenta.²⁵ The newborn under discussion was presented late on day 5 in the SCANU, missing scope of placental examination, umbilical blood serology or

RT-PCR within 48 hours of age to exclude vertical transmission.

Symptomatic and supportive treatment along with supplemental oxygen is the mainstay of therapy for COVID-19 patients. Maintenance of water electrolyte and acid-base balance is important. Supplement of water and electrolyte should be appropriate to avoid pulmonary edema and hypoxia.⁴ Available evidence suggest that low dose corticosteroids are helpful for patients with severe symptoms, oxygen requirement and mechanical ventilation.²⁶ The neonate was managed in the line of neonatal sepsis and was discharged when discharging criteria was fulfilled. His clinical course was consistent with current literature^{4,20} as the clinical course of COVID-19 in neonates was not severe. Failure of earlier screening for COVID-19 was a limitation in the management of present case. Follow-up RT-PCR tests recommended by standard guidelines²⁶ at 48-72 hours interval until two consecutive tests are negative, could not do here.

Conclusion

Possibility this is the first few reported neonatal cases of COVID-19 infection in Bangladesh and cannot be ignored. Infants may present with features of nonspecific infection. When a newborn infant presents with non-specific symptoms of infection with an added history of contact with COVID-19, it demands PCR testing for COVID-19. Suspicion about possibility of occurrence of COVID-19 in newborn infants with prompt identification is essential to limit further transmission in the community. Early institution of supportive treatment, close monitoring and follow-up may save the life of a COVID-19 affected newborn infant with favorable outcome.

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