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CASE REPORT

Possibility of COVID-19 Vertical Transmission to Newborns: Case Report

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ABSTRACT

Coronavirus disease 2019 (COVID-19) has impacted people of all ages, including neonates. However, confirmed data on its vertical transmission is still scarce. As a result, displaying various cases of COVID-19 in neonates may assist in understanding the virus's behavior during pregnancy. This report shows a 32-year-old mother with a 5-day history of acute respiratory disease tested positive for COVID-19 by real-time polymerase chain reaction (RT-PCR), presented with labor pain at 34 weeks of gestation, and underwent an emergency cesarean section. She gave birth to a preterm male baby, who tested positive for RT-PCR less than 24 hours after birth and fifth day of life. His outcome was good. *J Microbiol Infect Dis 2022; 12(4):163-165.*

Keywords: *Acute espiratory disease; COVID-19, neonate; vertical transmission, infectious disease transmission*

INTRODUCTION

The World Health Organization announced COVID-19's pandemic status in March 2020 [1]. More than 263.625 and 5.22 million people worldwide have been infected and died, respectively, by November 2021. Pregnant females with COVID-19 have an increased risk for SARS and MERS infection, which might be associated with adverse pregnancy outcomes, including abortion, preterm birth, and stillbirth. Besides this, a high maternal and neonatal morbidity and mortality rate may occur [2]. Vertical transmission refers to the transmission of an infectious agent from the mother to either the fetus (antepartum or intrapartum) or the neonate (postpartum) through the placenta in utero, contact with body fluid during childbirth or direct contact during breastfeeding after birth [3].

Although the possibility of COVID-19 vertical transmission is still unknown and needs further investigations, a systematic review reported that 3.28% of neonates and one amniotic fluid sample tested positive for COVID-19 [4]. We report a case of COVID-19 vertical transmission to a newborn, which was validated by laboratory analysis and investigation in Egypt, hoping it helps to understand the behavior of the Coronavirus in pregnant females and neonates.

CASE

From May 1st, 2020, to November 20th, 2021, 60 pregnant women who tested positive for COVID-19 infection by real-time polymerase chain reaction (RT-PCR) were admitted to El-Bagour General Hospital, Menofia governorate, Egypt. Their neonates were subjected to throat swabs and tested for COVID-19 infection using RT-PCR. Negative results of 59 neonates were reported, while one neonate tested positive 12 hours after birth. Regarding the mother of this neonate, she was 32 years old. Her obstetric history revealed that she was 34 weeks gestational age, gravida 4, para 3 (G4 P3+0), with three previous cesarean sections. She had a 5-day history of acute respiratory disease, including shortness of breath, fever, and cough. She was admitted to El-Bagour General Hospital and stayed for 22 days.

Regarding radiological examination, ground-glass opacities were observed in the upper and lower lung lobes during a spiral chest computer tomography (CT) scan. Laboratory

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investigations on admission showed lymphopenia (11×10^3/ μL) and elevated C-reactive protein levels (96 mg/L). Also, RT-PCR was performed two times (1st day and 11th day of admission), and both results were positive. As a result, she was diagnosed with COVID-19 pneumonia. She presented with labor pain. Abdominal ultrasound showed a single viable fetus, heart rate of 130 beats per minute, a weight of 2500 grams, average liquor, amniotic fluid index of 8 cm, the fundal position of the placenta, no placenta previa, and no retro-placental hematoma. An emergency cesarean section was scheduled and performed under strict infection control measures for the mother, newborn, and all medical team. She gave birth to a male baby, with 1 and 5-minute Apgar scores of 9 and 10, respectively, and a weight of 2500 grams. The RT-PCR was done twice, less than 24 hours after birth and fifth day of life, and reported positive results for COVID-19. The baby's chest radiography laboratory findings were normal. He was admitted to the neonatal intensive care unit (NICU), where he received supportive treatment without the need for respiratory support, he was shifted to an isolation nursery, and formula feed was immediately started. The neonate did not have any symptoms during the admission period. After seven days, he tested negative for COVID-19. On day 9, he was released from the hospital in good condition.

Later, a follow-up was done on the 14th day of life and the baby was very well. Unfortunately, the mother was admitted to the ICU on high-flow oxygen (15 liters per minute) on a non-rebreather mask. Her SaO_2 was 92%, despite the patient being tachypneic, dyspneic and feverish, so she was put on CPAP. Interleukin 6 and procalcitonin were measured, resulting in 373.5 pg /ml and 0.2 ng/ml, respectively. So she received two doses of Tocilizumab for cytokine storm. Echocardiography was done, which revealed mild pulmonary hypertension, ESPASP=42 mmHg. Unfortunately, the mother's condition deteriorated, and she died on the 22nd day of admission.

DISCUSSION

The possibility of COVID-19 vertical transmission can neither be confirmed nor denied till now; previous case reports and meta-analysis studies reported positive vertical transmission, while others reported the opposite. Our case report increases the suspicion of vertical transmission as the newborn boy tested positive for COVID-19 in the first 24 hours after cesarean delivery. His outcome was excellent. Dong et al. [5] reported a COVID-19-positive neonatal case born to COVID-19 positive mother through a cesarean section. Multiple tests confirmed the positive neonatal case as RT-PCR of nasopharyngeal swabs, IgM and IgG antibodies, cytokine, and other biochemistry tests in blood. Elevated IgM antibody level increased the possibility of vertical transmission as IgM antibodies do not pass the placenta, so the neonate was infected in utero [5]. Another positive neonatal case confirmed by RT-PCR of nasopharyngeal and oropharyngeal swabs was detected in a mother whose placenta, amniotic fluid, vaginal secretions, and cord blood samples were negative. On day 11, This neonate died from pulmonary hemorrhage [6]. Parsa et al. [7] also reported a positive COVID-19 pregnant female who underwent an emergency cesarean section and gave birth to a girl neonate with COVID-19, both the mother and her newborn were positively confirmed using RT-PCR. On day 28, the neonate was discharged from the hospital in good health. [7]. Moreover, a systematic review that included 936 neonates for COVID-19 mothers revealed that 27 neonates had confirmed positive by RT-PCR of nasopharyngeal swabs, indicating a 3.2% pooled proportion for vertical transmission [3]. On the other hand, Nine pregnant women with laboratory-confirmed COVID-19 pneumonia had their clinical records, laboratory findings, and chest CT scans reviewed retrospectively, and evidence of intrauterine vertical transmission was assessed by testing samples from amniotic fluid, cord blood, neonatal throat swab, and breastmilk after the first lactation. All tested samples were negative for the virus, as a result, Chen et al. [8] denied the potential for vertical transmission in COVID-19 pneumonia women in late pregnancy [8]. The results were further confirmed by another case report [9].

Conclusion

In our case report, the neonate tested positive for COVID-19 during the first 24 hours of his life, increasing the evidence of intrauterine vertical transmission. However, the influence of COVID-19 on newborns is still an unclear

concern. Many neonates had a good outcome, but others did not.

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Ethical issues:

The mother has written informed consent was obtained before the publication of her newborn data.

Comment [SH1]: You said the mother died, how did you take this permission?

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