Possibility of Intrauterine Vertical Transmission of Coronavirus Disease 2019 (COVID-19): A Case Report from Iran

Abstract
With the onset of Covid 19 disease, the vertical transmission of the disease from mother to neonate was unknown. In this case, a mother affected by a severe Covid 19 a few days before delivery, was examined whether her baby get the disease without breastfeeding and close contact with her mother or not. Finally, the case study show corona virus did not transmitted through blood from mother to the baby and he was completely healthy.

Keywords: COVID-19, intrauterine, neonate, maternal, vertical transmission

Introduction
The worldwide outbreak of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) since December 2019 has caused considerable global concern.[1] Investigations on COVID-19 transmission is underway to help cutting a link in its chain of transmission. Currently, the main routes of transmission include contact, droplets and aerosol inspiration, but scientists contend that the fecal-oral transmissions should not be overlooked.[2] Isolation of the cases and effective tracing of their social contacts are also recommended.[3] Few studies are conducted on the possibility of intrauterine vertical transmission of COVID-19 during pregnancy.[4] Currently, it has been shown that family members may have infected the disease but still remain asymptomatic.[5] Therefore, the present case study was done to investigate and follow up an asymptomatic COVID-19 neonate.

Case Report
The 21-year-old pregnant woman, gravida 1, underwent cesarean section due to eclampsia at week 33 of gestational age. She experienced fever since three days prior to operation, and complained of headache, dry cough, and shortness of breath, which made her a COVID-19 suspected case. Clinical tests confirmed the diagnosis of COVID-19 and she received its treatment in an isolated room.

The pre-term male neonate born by cesarean section on March 14, 2020 was transferred to NICU, and isolated due to maternal suspicion of COVID-19. Contact and respiratory isolation was prescribed for the neonate in negative pressure room and all visits to the patient were prohibited. On day 1, Laboratory examination included RBC = 4.2 million/mm3, WBC = 10.2 × 109/L, a platelet count 146 × 109/L, absolute neutrophil count of 7.752 × 109/L, a lymphocyte cell count of 2.04 × 109/L, and a hemoglobin concentration of 14.1 g/dl. The patient’s serum C-reactive protein was negative. Blood culture test results were negative; hemoglobin O2 saturation was 87.8%; chest x-ray was normal [Figure 1]. Repeated real-time RT-PCR tests for SARS-CoV-2 from oropharynx swabs were negative on March 14 and March 17.

The patient was monitored, but not intubated, in NICU, received O2 via oxyhood, and O2 saturation was between 93% and 95%. The patient’s vital signs were normal, had no fever and was slightly hypothermic (T = 36.8), heartbeat 110 per min, with the respiration rate of 33 per minute. The baby did not breastfeed and only got infant formula.

The patient underwent phototherapy due to physiologic jaundice. O2 saturation drop (up to 92%) was occasionally observed. He was calm but sleepy, and

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responded to stimulations, tolerated infant formula and had no abdominal distension. Phototherapy was discontinued on March 23rd, 2020. Medical order NCPAP was prescribed if required but was not performed due to normal O2 saturation (90-95%). Fluid and electrolytes, and acid-base balance were investigated. Pulmonary surfactant was not applied. No problem was observed with the baby’s O2 saturation drop and cyanosis; the patient continued with oxygen. On March 25, 2020, another oropharynx sample was sent to laboratory under sterile conditions to determine the covid-19 test result, which was negative. This test was conducted by real-time reverse transcriptase polymerase chain reaction (RT-PCR) tests for COVID-19. On the same date, chest X-ray showed bilateral perihilar shadowing indicated of bronchopneumonia; and no sign of coronavirus was evident [Figure 2]. Blood tests also showed no sign of lymphopenia; the results are as follows: RBC = 5 million/mm3, WBC = 5.6 × 10⁹/L, absolute neutrophil count of 3.92 × 10⁹/L, a lymphocyte cell count of 1.512 × 10⁹/L, a platelet count 156 × 10⁹/L, and a hemoglobin concentration of 16 g/dl. The patient’s serum C-reactive protein was negative. Liver function tests were also normal: SGOT = 36 units per liter of serum, SGPT = 18 U/L, LDH = 888 U/L, total bilirubin = 5.5 mg/dL, direct bilirubin = 0.2 mg/dL. The result did not confirm vertical transmission of (COVID-19).

Discussion

The case we present here was found suitable for the possibility of placental vertical transmission of coronavirus disease 2019 (COVID-19) since the neonate was not born though vaginal labor, neither did the baby experience mucus and eyes contaminations with maternal secretions and fecal matter. Also, the baby got infant formula, was isolated from the infected mother and other suspect family members. We would like to recommend the investigation of other transmission routes such as breastfeeding or through birth canal. The results of the present case study seems to eliminate our concerns of intrauterine vertical transmission of coronavirus disease 2019 (COVID-19), particularly for neonatologists and NICU staff, in rational use of personal protection equipment (e.g., gloves, medical masks, goggles or a face shield, and gowns, as well as N95), and apparently isolation of the neonate, prescription of pharyngeal test and x-rays will not be necessary in diagnosing neonatal COVID-19.

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Conflicts of interest

There are no conflicts of interest.

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