

Neonatal COVID-19 case from Turkey; a Case report of neonatal

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Abstract

The coronavirus disease 2019 (COVID-19) is a disease caused by a new type of coronavirus that the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and has affected nearly all countries worldwide. More than 5 million global cases have been reported to date. As first the case was identified in China in December 2019; then Turkey started reporting cases in March 2020. SARS-CoV-2 is highly infectious and especially leads to morbidity and mortality in elderly and chronically ill patients. In children, fewer and milder infections have been reported. There are 3 cases reported in the neonatal period so far in the literature. We have observed that the literature does not contain any newborn cases reported from our country. We report the first neonatal case of COVID-19 from Turkey.

Keywords: Coronavirus; COVID-19; SARS-CoV-2; neonatal

INTRODUCTION

The new type of coronavirus, which is named the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is a major public health concern that continues to affect the world. After the first case seen in December 2019 in Wuhan, the capital of China's Hubei province, the virus spread to too many countries worldwide. More than 10 million cases have been globally reported to date. The World Health Organization (WHO) defined the infection Coronavirus Disease 2019 (COVID-19) and declared it a pandemic (1).

It is estimated that animals are the source of the coronaviruses which are infecting humans. It is known that SARS was transmitted from bats in the 2002 outbreak, and camels were responsible for the 2012 outbreak of MERS (2). The source of COVID-19 was shown to be seafood. This virus is highly contagious and the primary modes of transmission are through droplets and close contact (3).

COVID-19 cases are classified as suspected and confirmed cases. A confirmed case is defined as a patient in whom the virus is isolated through polymerase chain reaction (PCR) of a respiratory tract or blood sample. Infants with mothers who have a COVID-19 infection 14 days prior or 28 days after giving birth and newborns who make close contact with infected individuals are defined as suspected cases (4).

Although COVID-19 affects the elderly and those with chronic disease, there are reported cases involving every age group. There are a limited number of cases reported in children, particularly infants. The first case of COVID-19 in our country was identified on March 13th, 2020, and the total number of cases is currently 235,000 (5). We have determined that there are very limited the reported cases of neonatal COVID-19 in literature and we saw there is not any reported neonatal cases from Turkey. For this reason, we present the first case from Turkey.

CASE REPORT

The girl baby who was born from the first pregnancy of 23-year-old mother as full-term of 2100 g with a normal spontaneous vaginal route has a normal prenatal history. The baby did not require resuscitation upon birth and was monitored beside the mother. 48 hours following birth, the baby was discharged after demonstrating typical examination results and no feeding problems. On the postnatal 22nd day, the patient with a fever that had been persisting for 2 days was brought to our emergency clinic with the ambulance. The patient was taken to an isolated area with her mother due to her fever. The patient was examined by health-care personnel that was wearing personal protective equipment and the necessary tests were subsequently conducted. The patient's body temperature was evaluated as 37.6°C, heart rate 165/min,

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respiration rate 42/min and body weight 2500 gr. Systemic examinations were normal and there was no sign of dehydration. Blood samples showed white blood cell count (WBC) 9820/mm³, lymphocyte 6750/mm³, and platelet 339000/mm³. Of the inflammatory markers, interleukin-6 (IL-6) was found to be 1.5pg/ml and C-reactive protein (CRP) 0.314 mg/dl. The biochemical profile revealed that aspartate aminotransferase (AST) was 36U/l, alanine aminotransferase (ALT) 22U/l, and lactate dehydrogenase (LDH) 380U/l. The chest radiograph was evaluated to be normal (Figure 1). The patient's PCR test for COVID-19 was positive. The patient is placed in an isolated unit with her mother because her diagnosis of COVID-19 was resulted positive. The baby's cradle was placed 2 meters away from her mother's bed. Blood culture was taken and started the treatment of ampicillin and amikacin for the secondary infections. It was determined that no other household members exhibited symptoms. All the family members, including the mother, were screened using PCR. The mother's test result was positive.

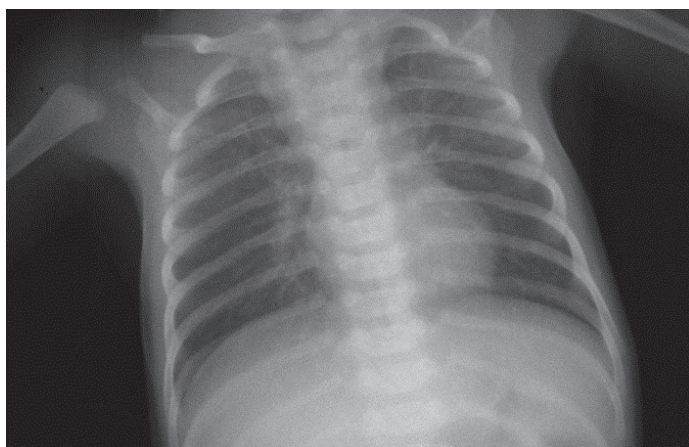


Figure 1. Chest X-ray image of the patient

The mother had a fever once on the second day after admission, her treatment was initiated by the infectious diseases department. She had also been informed in detail about hand-washing and wearing a mask. The baby was fed by her mother. Since the transmission of COVID-19 through breastfeeding has not been reported, the mother was informed on the importance of breastfeeding and instructed to continue. The baby's fever persisted for 4 days while under supervision. No respiratory distress or feeding intolerance was observed. The baby had diarrhea 4-5 times per day between the 3rd and 5th days of the hospital stay. Stool analysis showed no pathology. The diarrhea was presumed to be a result of COVID-19. Blood and urine cultures were used to test for late-onset sepsis and they were negative. Antibiotic treatment was terminated after the 7th day. The patient was discharged after going 3 days without fever and having 2 negative PCR tests for COVID-19. Before discharge, the mother was informed on proper feeding and isolation rules at home. We received an informed consent form from her parents before we published the case.

DISCUSSION

Coronaviruses are single-stranded RNA viruses with a size of 40-60 nm. They consist of 4 sub-groups including alpha, beta, gamma, and delta (6). It has been determined that the betacoronavirus responsible for COVID-19 contains a nearly identical nucleotide structure to that of the severe acute respiratory syndrome (SARS). Common human coronaviruses include HCoV-OC43, HCoV-HKU1, HCoV-229E and HCoV-NL63; although these result in common cold and mild upper respiratory tract infections in people with healthy immune systems, they are responsible for lower respiratory tract infections in the elderly and those with compromised immune systems (7).

It is frequently thought that newborns are at higher risk due to their immature immune systems; however, very few infant cases have been reported to date (8). The virus is primarily transmitted through close contact, and can also be spread through droplets, aerosols, and fecal-oral route (9). Viral infections, particularly the TORCH group, can be passed on from mother to baby through vertical transmission, and infect the fetus. Studies regarding COVID-19 showed that the virus cannot be vertically transmitted. Nevertheless, in situations such as vaginal birth, there is a risk of infection because the baby is exposed to the mother's infected materials. When mothers with suspected or confirmed COVID-19 are giving birth, it should be noted that both the health-care personnel and baby are at risk of being infected, and the necessary precaution should be taken (10).

Breast milk is essential for newborns and infants, due to its nutritious and anti-infective properties. The World Health Organization recommends that all mothers, including those with COVID-19, should breast feed their child with proper use of a mask and hand-washing practices (11). We advised the mother to breast feed and provided her information regarding breast milk.

To enter the cell, the viruses use the angiotensin-converting enzyme (ACE-2) receptor on the cell's surface. A considerable amount of ACE-2 receptors can be found on the surface of the lung and esophagus epithelium as well as enterocytes in the colon and ileum (12). COVID-19 has an average incubation period of 5.2 days (1-14 days) and 97% of symptoms arise within 10.4 days (13). Children exhibit lower rates of infection and milder symptoms compared to adults. It is unclear why children are infected less; nonetheless, it has been speculated that children have a different distribution of ACE-2 receptors in tissue and its function and maturity may be lower. It is thought that children whose immune systems are immature will not be able to initiate cytokine storms as much as adults (14). Children most frequently exhibit non-specific symptoms such as fever, runny nose, nausea, vomiting, diarrhea, abdominal pain, and hypoactivity. Despite being few, there have been reports of child cases requiring respiratory support. There are no specific symptoms exclusive to newborns. Similar to neonatal sepsis, the presentation can vary from affecting multiple systems to

having an asymptomatic course (15). Our case had a total of 5 days of fever and mild diarrhea.

For diagnosis, patients should be questioned for any previous close contact with COVID-19 peoples and whether they reside in an endemic area; in doing so, their risk of being infected by the virus can be determined. Suspected cases exhibiting fever, respiratory and gastrointestinal system symptoms should specifically be evaluated in detail. The virus can be isolated through PCR of samples from the respiratory tract, endotracheal aspirate, blood, and stool (15). We diagnosed the patient by performing PCR on a nasopharyngeal swab specimen and identifying COVID-19. Chest x-ray and tomography can reveal signs of pneumonia and help in the diagnosis. Laboratory findings are non-specific. While white blood cell count is usually normal or slightly decreased, lymphopenia is more frequently observed. Liver enzymes (AST, ALT), muscle enzymes (CK), and inflammation markers (CRP, IL-6, PCT) may be elevated (16). Our patient tested negative for inflammation markers and had a normal lymphocyte and platelet count.

The highly infectious SARS-CoV-2 is known to be sensitive to ultraviolet light and heat. The virus can be neutralized with lipid solvents such as ethanol (75%), disinfectants containing chlorine, and peroxyacetic acid (6). The first step of treatment is preventing the transmission and spread of the virus; this can be accomplished by using masks and properly washing hands for a minimum of 20 seconds. The Turkish Ministry of Health stated that drugs such as oseltamivir, hydroxychloroquine, azithromycin, lopinavir, and ribavirin may be used to treat children and newborns with COVID-19; however, the efficacy of antiviral treatment in neonates is not clear (17). Symptomatic treatment is usually the method of approach in children. The first reported newborn case was a 17-day male infant who, after close contact with family members, experienced fever and cough lasting 3 days; the patient was cured following symptomatic treatment (18). We did not give our patient-specific treatment. Symptomatic treatment was given and the patient was monitored for potential complications. The patient's clinical status did not worsen and no complications were observed.

CONCLUSION

As a result, neonates can be infected with COVID-19. We did not initiate antiviral or hydroxychloroquine treatment because our patient did not exhibit respiratory symptoms and had healthy chest x-ray results. The patient's clinical status was closely monitored and we had noticed that the symptoms had diminished on the 6th day. Although mortality has not yet been reported in newborn cases, we must always be observant. All cases, including asymptomatic ones, must be isolated to prevent transmission. The diagnosis of COVID-19 should not be forgotten in infants with symptoms and infants with contact history.

Conflict of interest: The authors declare that they have no competing interest.

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