

COVID-19 (SARS-CoV-2) Infection in Neonates: A Single-center Case Series

Yenidoğanlarda COVID-19 (SARS-CoV-2) Enfeksiyonu: Tek Merkezli Bir Olgu Serisi

Emrah Can, Çağrı Cumhuri Gök, Şahin Hamilçikan

University of Health Sciences Turkey, İstanbul Bağcılar Training and Research Hospital, Clinic of Neonatal Intensive Care, İstanbul, Turkey

Abstract

More than five million people worldwide have been infected with Coronavirus disease-2019 (COVID-19), and it has been reported that children are less infected than adults and newborns are less infected than children. The symptoms of COVID-19 are mild in children compared to adults and can often be asymptomatic. However, after 1 year of the epidemic, serious cases began to be reported in children, especially with mutant strains. Pediatricians need to know the diagnosis and course of these infections in newborns in terms of case management. There is still a lack of definitive information on the infection and transmission of COVID-19 in newborns. In this case series, four cases of community-acquired neonatal COVID-19 infection followed in our clinic are presented.

Keywords: COVID-19, neonate, SARS-CoV-2

Öz

Tüm dünyada beş milyondan fazla insan Koronavirüs hastalığı-2019 (COVID-19) ile enfekte oldu ve çocukların erişkinlere kıyasla daha az enfekte olduğu ve yenidoğanların çocuklardan daha az enfekte olduğu bildirilmiştir. COVID-19'un semptomları çocuklarda erişkinlere kıyasla hafiftir ve sıklıkla asemptomatik olabilirler. Ancak salgının 1. yılından sonra özellikle mutant suşlarla birlikte çocuklarda da ciddi olgular bildirilmeye başlanmıştır. Çocuk doktorlarının, yenidoğanlarda bu enfeksiyonların tanısını ve seyrini bilmeleri olgu yönetimi açısından önemlidir. Yenidoğanlarda COVID-19 enfeksiyonu ve bulaşı konusunda hala kesin bilgi eksikliği vardır. Bu olgu serisinde kliniğimizde izlenen toplumdaki edinilmiş dört neonatal COVID-19 enfeksiyonu olgusunu sunulmuştur.

Anahtar kelimeler: COVID-19, SARS-CoV-2, yenidoğan

Introduction

In December 2019, Coronavirus disease-2019 (COVID-19) [severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2)] was first identified in Wuhan, China. The infection spread rapidly all over the world. The World Health Organization has declared a global pandemic (1). The symptoms of COVID-19 in children are similar to those in adults, but in children, the symptoms are variable. COVID-19 affects children, boys, and girls equally, with a reported average age of 7.6 years. Fever or chills and cough are the most frequently reported symptoms in children. Clinical findings overlap with many other clinical syndromes such as pneumonia, bronchiolitis, and gastroenteritis (2-5).

In newborns, the clinic is often similar to the pediatric age group. Acute respiratory failure can be seen in advanced neonatal cases. In the neonatal period, cases are frequently taken on an in-family basis. Although cases that can be transmitted vertically in the intrauterine period have been reported, a vertical transmission has not been clarified yet. However, very few neonates were found positive for pandemic COVID-19 infection and the clinical features of infected newborns were different (6,7).

We aimed to present a series of COVID-19 cases diagnosed as PCR positive in tertiary neonatal intensive care because it is rarely seen in the neonatal period. From all presented cases, parental consents were obtained.

Address for Correspondence: Emrah Can, University of Health Sciences Turkey, İstanbul Bağcılar Training and Research Hospital, Clinic of Neonatal Intensive Care, İstanbul, Turkey

E-mail: canemrahcan@yahoo.com **ORCID ID:** orcid.org/0000-0002-2163-6564 **Received:** 14.06.2021 **Accepted:** 22.09.2021

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Case Reports

Case 1

A 25-day-old male newborn was admitted to the hospital with the complaints of fever and cough that had been ongoing for two days. He had been born with cesarean section, weighed 3.900 g in 39 3/7 weeks of gestation. Upon physical examination, the actual weight was 4.900 g, the axillary temperature was 38 °C, and respiratory rate was 70 breaths per minute. Rhonchus was heard in his breathing sounds. Chest X-ray revealed right paracardiac and left basal irregular opacities. Lymphopenia, thrombocytopenia, or elevated liver enzymes were not detected. C-reactive protein (CRP) (0.8 mg/L) and procalcitonin (0.1 ng/mL) were normal. Her mother had runny nose and cough symptoms. She had no history of travel but she had contracted with a health worker partner. The real-time reverse transcription-polymerase chain reaction (RT-PCR) test for the detection of COVID-19 in nasopharyngeal swabs was positive in both the mother and newborn. In the mother's partner, the test was negative. Ampicillin-gentamicin and Oseltamivir were started. We did not start hydroxychloroquine treatment since mechanical respiratory support treatment was not required. Antibiotic treatment was completed in 7 days. A pulmonary CT scan was not performed due to lack of respiratory distress, increased tachypnea, and decreased fever. The control RT-PCR test was positive following the treatment. RT-PCR tests were found to be positive on the 14th and 16th days of admission. The RT-PCR test results were negative on the 21st and 22nd days of admission. The neonate was closely monitored for 3 weeks and he was discharged from the hospital asymptotically on the 22nd day of the hospitalization.

Case 2

A five-day-old female newborn was admitted to the hospital with the complaints of reduced feeding and jaundice. She had been born with cesarean section, weighed 1.850 g in 34 3/7 weeks of gestation. Upon physical examination, the patient was icteric, weighed 1.800 g, the axillary temperature was 36.5 °C, there was thrush in the mouth, and a diaper rash was observed. The mother's breast was normal. Respiratory sounds and chest X-ray were normal. The total bilirubin level was 20 mg/dL, platelet and lymphocyte count, CRP (0.4 mg/L), and procalcitonin (0.1 ng/mL) were normal. Ampicillin-gentamicin and phototherapy were started. On the 5th day of hospitalization, it was learned that he had contact with the COVID-19 positive grandmother. RT-PCR test in nasopharyngeal swab was positive in both the

mother and newborn. Antibiotic treatment was completed in 7 days. On the second week of life, she exhibited a decrease in sucking and mild tachypnea with mild intercostal retractions. A capillary sample blood gas analysis and a chest radiograph were normal. The serum level of CRP was normal (0.5 mg/L). After 48 h, the symptoms resolved. In the second week, again the RT-PCR tests were positive. There was redness in one eyelid on her 21st postnatal day, lasting for three days. Tobramycin started for susceptible conjunctivitis. In the third week of hospitalization, two RT-PCR tests of the newborn at 24-hour intervals were found to be negative. She was discharged asymptotically on the 23rd day of her hospitalization.

Case 3

An 11-day-old female newborn was admitted to the hospital with the complaints of fever-reduced feeding. She had been born with the weight of 2.800 g in 39 6/7 weeks of gestation. Upon physical examination, the actual weight was 2.870 g, the axillary temperature was 39 °C, and respiratory rate was 56 breaths per minute. Feeding was reduced and the front fontanel was taut. Respiratory sounds and chest X-ray were normal. Lymphopenia, thrombocytopenia, or elevated liver enzymes were not detected. CRP was normal. Her mother had no symptoms and she had no history of travel and she had not contracted with a health worker partner, but a member of the family was diagnosed with COVID-19. RT-PCR test for the detection of COVID-19 in nasopharyngeal swab was positive in the first test, negative during hospitalization but the test taken 24 hours later was positive. Lumbar puncture was planned and protein level 520 mg/dL and glucose 20 mg/dL were found in the cerebrospinal fluid while blood glucose was 127 mg/dL and cerebrospinal fluid was seen purulent. Ampicillin and cefotaxime were started in meningitis doses. Antibiotic treatment was completed in 14 days. A pulmonary CT scan was not performed due to lack of respiratory distress, increased tachypnea, and decreased fever. Streptococcus agalactia was reproduced in blood culture and there was not any reproduction in cerebrospinal fluid. The RT-PCR test results were negative on the first and 15th day of admission. The neonate was closely monitored for 17 days and she was discharged from the hospital as asymptomatic after finishing the treatment of meningitis on the 28th day of the hospitalization.

Case 4

A 13-day-old female newborn was admitted to the hospital with the complaints of reduced feeding. Her acceptance weight was 3.340 g and had been born at 39+2

weeks of gestation. Upon physical examination, she was tachypneic and had retractions. Breathing sounds were normal. Lymphopenia, thrombocytopenia, or elevated liver enzymes were not detected. CRP was 0.21 mg/L. She had no history of travel but she had no contact with a health worker. RT-PCR test for the detection of COVID-19 in nasopharyngeal swab was positive in both the mother and newborn. We did not start hydroxychloroquine treatment since mechanical respiratory support treatment was not required. Ampicillin and cefotaxime were started. Antibiotic treatment was completed in 7 days. A pulmonary CT scan was not performed due to lack of respiratory distress, increased tachypnea, and decreased fever. The control RT-PCR test was negative following the treatment. RT-PCR tests were found to be negative on the 11th day of admission. The neonate was closely monitored for 12 days and she was discharged from the hospital as asymptomatic on the 12th day of the hospitalization.

Discussion

More than 95% of newborns of SARS-CoV-2-positive mothers are well at birth. Symptoms seen in newborns are largely associated with early delivery and adverse uterine environments caused by critical maternal COVID-19. Mild infection symptoms that do not require respiratory support have been identified in some newborns of infected mothers, but most of these cases have been associated with community-acquired transmission (8,9). In our cases, it was determined that they acquired this virus later than the COVID-19 positive cases in their families.

Symptoms and signs of COVID-19 in neonates remain blurry. In a systematic review of infants <3 months with SARS-CoV-2 infection, 4% were asymptomatic, 92% were hospitalized, 20% were admitted to the intensive care unit, and 3% required mechanical ventilation. Symptoms included fever (73%), cough (38%), rhinitis (36%), respiratory distress (26%), malnutrition (24%), vomiting (14%), and diarrhea (14%) (10).

In thirty-seven symptomatic neonatal patients from all over Turkey in a national study, most common findings were fever, cough, and hypoxemia with the rates of 49%, 41%, and 27%, respectively. While oxygen administration (41%) and non-invasive ventilation (16%), mechanical ventilation requirement (3%) was found. CRP elevation and high prothrombin times of the cases were found to be correlated with case severity (11).

There were diagnosed fever, cough, tachypnea, nutritional problems, hyperbilirubinemia, unexpected early-onset moniliasis, and diaper dermatitis in our cases.

Laboratory findings are variable in children diagnosed with COVID-19. In a systematic review of laboratory-confirmed COVID-19 cases in children, in most children, complete blood count was normal; low leukocyte count was found in 17% and neutropenia or lymphocytopenia in 13%. High CRP (>0.5 mg/dL) or procalcitonin (>0.5 ng/mL) was identified in approximately one third of the cases. Serum aminotransferases, creatine kinase, and lactate dehydrogenase elevations have been reported as another common laboratory abnormality (3,12,13). Lymphopenia, thrombocytopenia, or elevated liver enzymes were not detected and CRP and procalcitonin levels were normal in our cases.

COVID-19 infection is still an infection with unknowns. Although cases often show mild symptoms in the neonatal period, it should be kept in mind that follow-up is necessary and that newborns are different from the pediatric age group.

Ethic

Informed Consent: From all presented cases, parental consents were obtained.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: E.C., Ç.C.G., Design: E.C., Ş.H., Data acquisition and process: E.C., Ç.C.G., Ş.H., Data analysis and interpretation: E.C., Ş.H., Literature review: E.C., Ç.C.G., Ş.H., Manuscript writing: E.C., Ş.H., Manuscript review and revision: E.C., Ş.H.

Conflict of Interest: No conflict of interest was declared by the authors.

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