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Case Report

Management of 19 Days Old Newborn with COVID-19

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ABSTRACT

Introduction: Coronavirus disease (COVID-19) can affect the newborn like other age groups, but usually, symptoms will be mild and nonspecific. Real-Time-Polymerase Chain Reaction (RT-PCR can do confirmation of the disease) for COVID-19 for a nasopharyngeal swab.

Case Report: 19 days old newborn was infected from his mother. He was suffering from mild symptoms in the form of fever, cough, and vomiting. Admitted in an isolation room in NICU, the disease was confirmed by RT-PCR for COVID-19 for a nasopharyngeal swab, routine investigations to roll out sepsis done, chest lesions was diagnosed by CXR and lung ultrasound then followed up by lung ultrasound. The baby received supportive therapy, antibiotic and antiviral medications. Improved clinically and radiologically after 5 days of admission. The nasopharyngeal swab was twice negative before discharge. The baby has seen twice in the neonatal follow-up clinic after the discharge he was clinically very well.

Background: This is a case report of the first reported neonate infected with COVID-19 in Makkah, Saudi Arabia. We are adding to the already available information that; neonates can acquire COVID-19 after birth and their immature immune system leaves them vulnerable to severe respiratory viral infections, which may cause severe disease among neonates, especially preterm. Compared with adults, children with severe Acute Respiratory Syndrome- Corona Virus 2 (SARS-CoV- 2) infections have milder clinical symptoms and fewer laboratory and radiologic abnormalities. Lung ultrasound is a new tool for detecting lung diseases in clinical practice and exhibits high sensitivity and specificity, while its feasibility and convenience as a bedside application in NICU add further appeal.

Conclusion: If the newborn suffers from symptoms that are likely to be suggestive with COVID-19 infection, we should take a nasopharyngeal swab for confirmation of infection. Lung ultrasound is a safe examination for diagnosis and follows up the lung lesions of the affected newborn without exposure to unnecessary radiation. COVID-19 symptomatic newborn needs to be admitted in a negative pressure isolation room in NICU by taking into consideration all necessary infection control measures, receive supportive therapy, and psychosocial support for the family.

Keywords: Breastfeeding; Neonate; Coronavirus; COVID-19; Lung Ultrasound

INTRODUCTION

The novel Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), which causes the disease termed coronavirus disease 2019 (COVID-19), emerged in China in early December 2019. The outbreak was declared a public health emergency of international concern by the World Health Organization (WHO) on January 30, 2020 [1]. The Transmission of SARS-CoV-2 to neonates is thought to be predominately to occur primarily through respiratory droplets during the postnatal period when neonates are exposed to mothers or other caregivers with SARS-CoV-2 infection. Limited published reports have raised concern about possible intrauterine, intrapartum, or peripartum transmission Approximately 2%-5% of infants born to mother with positive COVID-19 have positive SARS-CoV-2 positive test in the first 24-96 hrs [2]. Although the 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. The presentation of COVID-19 in children and neonate can range from asymptomatic infection to severe respiratory distress. The most common clinical symptoms include fever, fatigue and dry cough [3]. Typical laboratory findings were minor changes in white blood cell counts, as well as mildly elevated inflammatory markers, liver enzymes, creatine kinase, lactate dehydrogenase or D-dimers. Radiologic findings were unspecific and milder compared with those in adults. They included unilateral or bilateral infiltrates on chest radiograph

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or Computed Tomography [4]. Lung ultrasonography has been previously described as a safe tool to study respiratory and cardiac diseases in neonates. Some authors have already suggested that lung ultrasound would be of interest in COVID-19 adult patients at various points of healthcare structure, also it could be of value when managing COVID-19 neonates [5]. There is no specific drug treatment for SARS-CoV-2 being similar to MERS-CoV and SARS-CoV. Symptomatic and supportive treatment is the mainstay of therapy for patients of SARS-CoV-2 infection, including the supply of oxygen, the maintenance of water-electrolyte, and acid-base balance [3].

We report a case of neonatal COVID-19 infection confirmed with naso-pharyngeal swabs testing positive by RT-PCR assay. We describe the findings of lung ultrasound monitoring during the first days following diagnosis and the relation between the ultrasound findings, results of the naso-pharyngeal swab and the clinical condition of the newborn.

CASE PRESENTATION

19 days old male, delivered full-term by vaginal delivery for 41 years old, G4P4 mother. Birth weight was 2.6 kg and Apgar score was 9, 9. Discharged home after 24 hours of delivery with a good general condition on breast-feeding.

On 2 June 2020, the mother gets infected after attending a family party with her relatives. She had a fever and cough. After 2 days, her baby also had a fever and cough so she sought medical advice in Primary Health Care with her 19 days old baby on 4 June 2020. COVID-19 was suspected for both of them, a nasopharyngeal swab was taken from both for confirmation, RT-PCR for COVID-19 done which came later COVID-19 positive for both, advised conservative management for both of them with self-quarantine at home with advice if any deterioration of the clinical condition they should go to the Emergency Department (ED) of our hospital.

After 2 days on 6 June 2020, the mother attends to the pediatric ER of our hospital, because her baby still had a fever and frequent attacks of cough followed by vomiting. In ER visual triage checklist

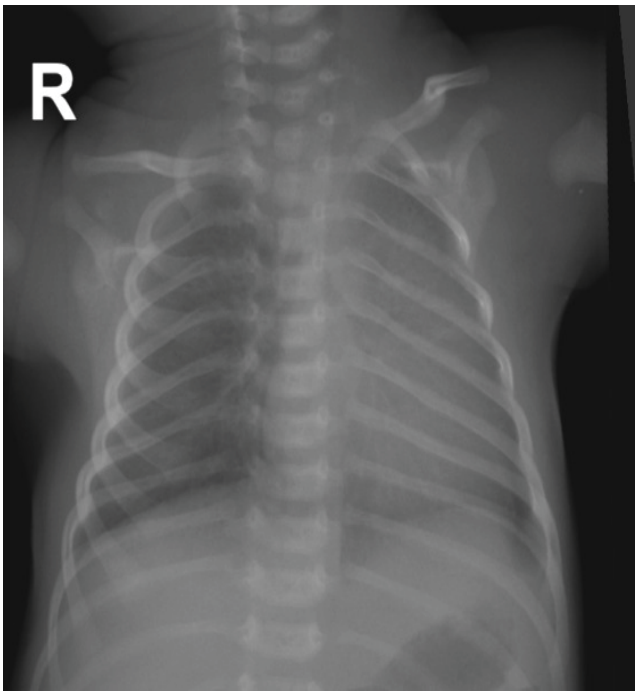

Figure 1: Characteristics Chest X-Ray was done on 6 June 2020, showed bilateral haziness, which is suggests pneumonia.

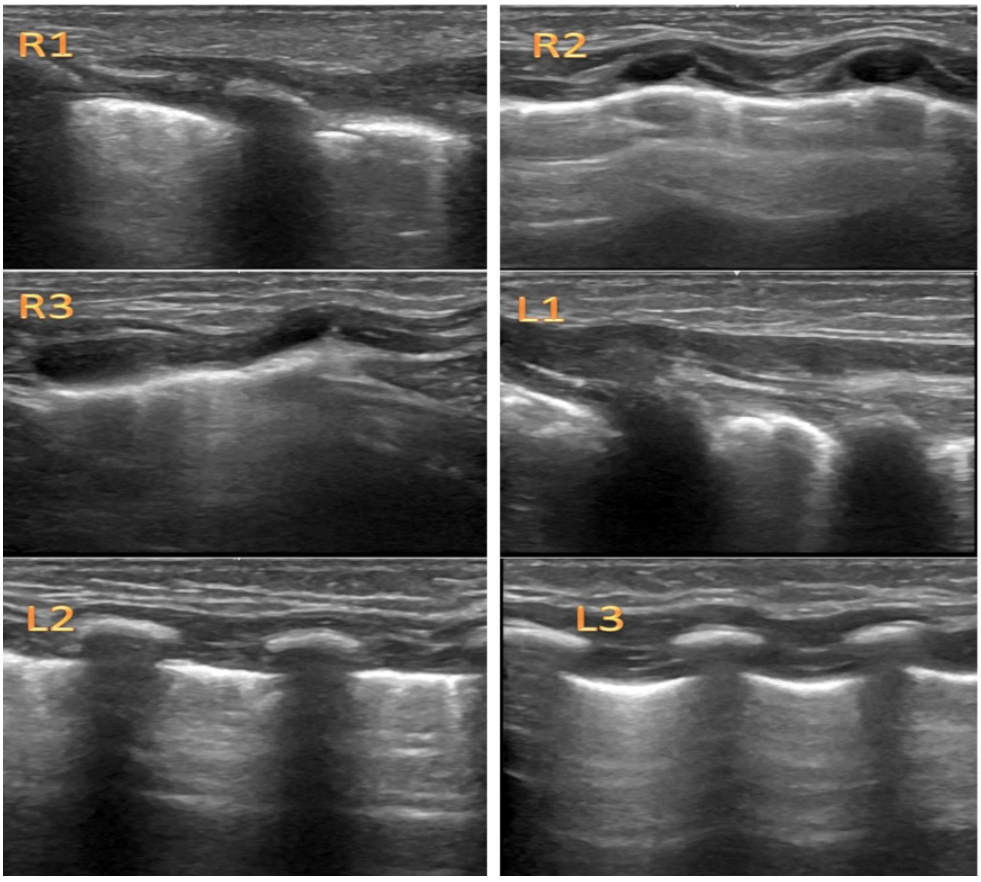

Figure 2: Lung ultrasound was done on 6 June 2020, showed bilaterally abnormal lung ultrasound findings, mainly B pattern and pleural line thickening with a severity score 6/18 as per Brat's lung ultrasound score.

for acute respiratory infection was done. The result of the score was 8 so she advised to go to an isolation room in ER, all precautions for air born infection was taken and baby was examined in ER, a decision was taken for admission in Neonatal Intensive Care Unit (NICU) and the baby was shifted to NICU by portable incubator with all precaution measures.

His body weight was 3 kg, head circumference: 37 cm, length: 52 cm. His vital signs showed; mild tachycardia heart rate: 188/ minute, temperature: 37.9°C, respiratory rate: 41/minute, blood pressure: 61/37 mm Hg, and saturation on room air was 99%. There were runny nose and frequent attacks of cough with vomiting. The other systemic and regional examination was within the normal range.

We rolled out bacterial sepsis by blood culture and sensitivity (C/S) was no growth. All other results of laboratory investigations including blood gas, blood glucose, serum electrolytes, bilirubin, liver functions, renal functions, complete blood count and C reactive protein were normal except serum ferritin was 337.3 µg/L (the upper limit is 250 µg/L) and D dimer was 0.58 µg/ml (the upper limit is 0.49 µg/ml). RT-PCR for COVID-19 confirmatory test for nasopharyngeal swab done 3 times the 1st sample was on 4 June 2020 result was positive for COVID-19, The 2nd sample on 8 June 2020 result was negative and the 3rd repeated on 16 June 2020 was negative. The mother's breast milk not tested for COVID-19. Chest X-Ray (CXR) showed bilateral haziness shown in Figure 1.

We did lung ultrasound at 1st day of admission, for 6 lung areas R1, R2, R3, L1, L2, and L3 (Figure 2) showed bilaterally abnormal lung ultrasound findings, mainly B pattern and pleural line thickening with a severity score 6/18 as shown in Table 1. As per Brat's lung ultrasound score [6].

The lung ultrasound repeated after 5 days it was normal (Figure 3), with A pattern, and Brat's lung ultrasound score 0/18 (Table 2).

In NICU he received incubator care in isolation negative pressure room. Kept nothing per mouth on intravenous fluid for the 1st 6 hours, then oral feeding of the artificial formula was resumed. The baby maintained saturation of over 95% on room air and bronchodilators nebulization. He received intravenous gentamicin 4 mg/kg/day till the result of blood C/S came to no growth, Per Oral (PO) azithromycin 10 mg/kg/day and PO oseltamivir 3 mg/kg/12 hours for 5 days. Visiting not allowed, but we contacted the

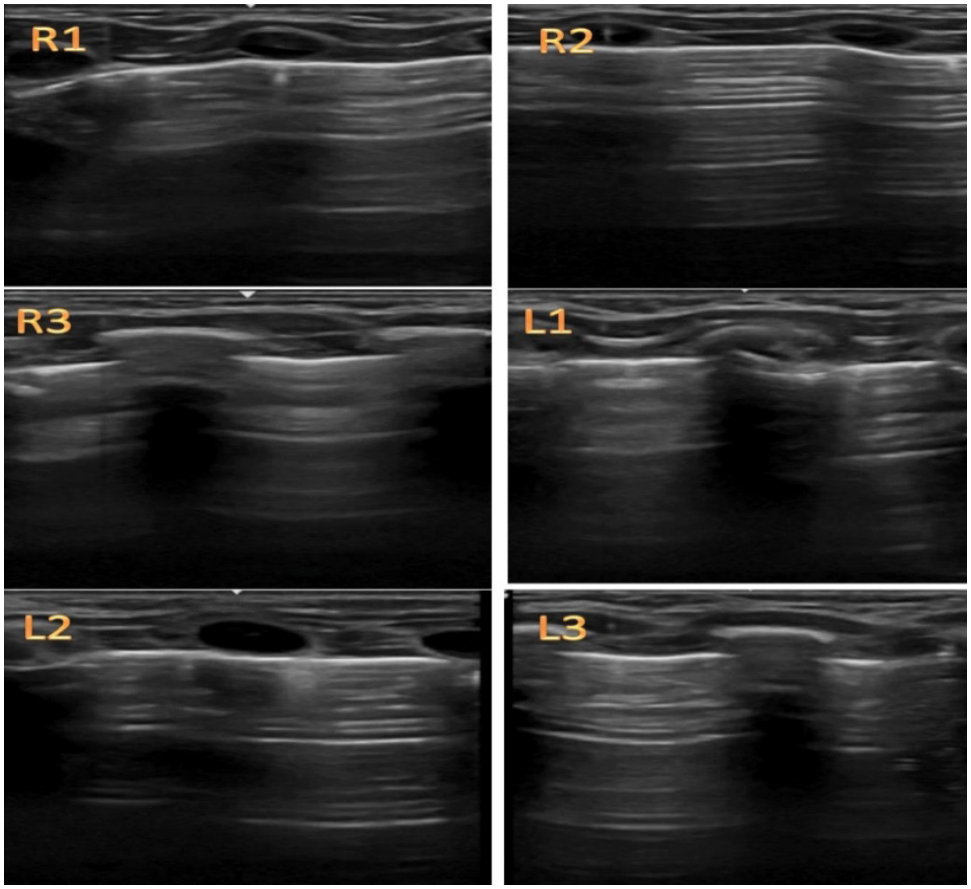

Figure 3: Lung ultrasound was done on 11 June 2020 was completely normal with A pattern and Brat's lung ultrasound score 0/18.

Table 1: Brat's lung ultrasound score on 6 June 2020.

Area	Right (score 0-3)	Area	Left (score 0-3)
R1: Upper anterior	(1) B pattern: thick pleural line, good pleural sliding, significant B lines with some A lines	**L1: Upper anterior**	(1) B pattern: thick pleural line, good pleural sliding, significant B lines with some A lines
R2: Lower anterior	(2) Severe B-pattern without sub-pleural consolidations, thick pleura with good sliding.	**L2: Lower anterior**	(1) B pattern: thick pleural line, good pleural sliding, significant B lines with some A lines
R3: Lateral	(0) A pattern	**L3: Lateral**	(1) B pattern: thick pleural line, good pleural sliding, significant B lines with some A lines
Total		**6/18**	

Table 2: Brat's lung Ultrasound score on 11 June 2020.

Area	Right (score 0-3)	Area	Left (score 0-3)
R1: Upper anterior	(0) A-pattern, good lung sliding and non-significant B lines.	**L1: Upper anterior**	(0) A-pattern, good lung sliding and non-significant B lines.
R2: Lower anterior	(0) A-pattern, good lung sliding and non-significant B lines.	**L2: Lower anterior**	(0) A-pattern, good lung sliding and non-significant B lines.
R3: Lateral	(0) A-pattern, good lung sliding and non-significant B lines.	**L3: Lateral**	(0) A-pattern, good lung sliding and non-significant B lines.
Total	0/18		

mother and her newborn daily through phone and video call. We advised mother to express her breast milk. The mother continued her home self-quarantine and conservative management until she became asymptomatic 5 days before the discharge of her baby and her repeated second nasopharyngeal sample was negative.

After 11 days of admission in the NICU, the baby was symptoms free and twice a negative nasopharyngeal swab for RT-PCR for COVID-19 so discharged home in good clinical condition. Mother resumes breastfeeding with instructions on infection control at home when taking care of this infant, including meticulous hand hygiene, particularly before and after feeding and diaper changes for the next 14 days. The baby re-examined twice in the NICU follow-up clinic after discharge he was clinically free. The father and other siblings did not catch the infection.

DISCUSSION

We are reporting a case of 19 days old, mildly symptomatic COVID-19, with a history of vertical transmission from his mother through breast milk or droplet infection from mother or other contacts. Novel coronavirus infection is a disease caused by SARS-CoV-2 and was named COVID-19 by the WHO on January 7, 2020 [7]. SARS-CoV-2 is a single-stranded Ribo Nucleic Acid (RNA) virus. The virus is transmitted across humans, primarily through respiratory droplets and contact. Infants and children affected by this virus usually have a history of exposure to sick contact [8]. Whether transmission can occur through mother- infant vertically or breast milk has not been established yet. Only limited data on SARS-CoV-2 excretions in breast milk are available [9]. The median incubation period is five days with a range of two to 14 days [8]. Viral RNA may be detectable in stools for several weeks [10].

The clinical manifestations may be asymptomatic, mild, or severe. The signs may include; Temperature instability. Respiratory and cardiovascular signs may include tachypnea, grunting, nasal flaring, increased work of breathing, apnea, cough, or tachycardia. Other findings may include poor feeding, lethargy, vomiting, loose stools, and abdominal distension [2].

Laboratory examinations may be non-specific. CBC may show normal or decreased leukocyte counts or decreased lymphocyte counts. Other findings may include; mild thrombocytopenia, elevated levels of creatine kinase, alkaline phosphatase, alanine aminotransferase, aspartate aminotransferase, and lactate dehydrogenase. COVID-19 can be detected in the upper respiratory tract, lower respiratory tract, blood, and stool. Radiography findings; CXR or lung ultrasound is likely to show pneumonia [2].

International guidelines had validated lung ultra-sonographic imaging in several neonatal respiratory diseases, as in meconium aspiration syndrome, etc. As stated in Chinese and Spanish Societies' recommendations on SARS-CoV- 2 infections, Lung ultrasound is suitable to study even the asymptomatic neonatal patients with a confirmed infection [5]. As for our case, we noticed when the newborn was symptomatic and the nasopharyngeal swab was positive, there was decreased aeration in the lung ultrasound finding. After five days of treatment, when the symptoms were hidden, and the swab was negative, the lung ultrasound was well aerated.

The treatment of neonates and children is similar to that of adults, but it also has its characteristics. To date, there are no specific drugs that can cure COVID-19. The purpose of treatment is to improve the patient's symptoms and provide better support [11]. According to Chinese expert consensus on the perinatal and neonatal management for the prevention and control of the 2019 novel coronavirus infection, A quarantine room with negative pressure for at least 14 days, managed in an incubator, donor milk, multi-disciplinary team, special airway management, emotional support to the family, and tertiary prevention is needed for the symptomatic neonate [12]. Data from adult literature showed the effectiveness of chloroquine and hydroxychloroquine against COVID-19 infection, and a synergistic effect of hydroxychloroquine and azithromycin. The question is whether neonatologists should consider this data when treating sick newborns who are COVID-19 positive. The use of azithromycin in the neonatal population is well documented and antimalarial drugs have been reported as a treatment for congenital malaria [13].

The neonate can be discharged home if it became asymptomatic with two negative RT- PCR for COVID 19 for two consecutive nasopharyngeal swabs. Physicians and nurses who take care of neonates suspected for or confirmed with COVID-19 should be equipped with protective equipment and receive psychological support. Family support should be done [12].

THE PATIENT'S FATHER PERSPECTIVE

Of course, the general situation was worrisome as talk continues about Corona and its danger to human life. I did not expect my son to be infected because his age did not exceed a month. When his mother had infected with the disease, the possibility for him to catch the same infection became high. After examining him through a medical survey, certain of his infection. However, I felt reassurance and internal satisfaction that God would recover him and when my wife told me about the good reception, care, and attention in the hospital, I increased my confidence that God will protect and recover him and that he is a warehouse with honest hands and responsible health personnel and medically advanced. Especially when we were communicating daily with the medical staff because of the home quarantine and they were giving us good news about my baby. After days and events passed, my

wife told me that a nasopharyngeal swab was done to detect the extent of his injury and the negativity of the examination turned out. I prostrated to God thanks to him in my place. At that time I believed that God had written for him the wellness and a new life. Praise be to God and thanks, then to the medical team who supervised his condition.

CONCLUSION

Most of the infected neonates have mild symptoms. Diagnosis is based on positive nasopharyngeal swabs RT-PCR for COVID-19, a single negative result cannot exclude the disease. Lung ultrasound is a safe and useful tool for diagnosis and follow-up of lung lesions in COVID-19 infection. Till now there is no specific medication to treat COVID-19, there is no role for antivirus medications, only supportive care is advised. Staff and family psychological support should be offered. Many aspects are still not clear regarding neonatal COVID-19 disease in terms of infection methods, pathogenesis, clinical pictures, and appropriate treatment so many scientific studies are required to clarify them.

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CONSENT

Consent was obtained from the father for publication in medical journals.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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REFERENCES

1. WHO. Corona virus disease 2019 (COVID- 19) Situation Report. January 2020.
2. MOH Neonatology Services Improvement Program. Saudi MOH Guideline for neonate born to mothers with suspected or confirmed COVID-19 infection, 2020.
3. Qi Lu and Yuan Shi. Coronavirus disease (COVID-19) and neonate: what neonatologist needs to know?. J Med Virol. 2020.
4. Zimmermann P, Curtis N. COVID-19 in children, pregnancy and neonates. Pediatr. Infect. Dis. J. 2020;39(6):469-77.
5. Hernández GR, Izquierdo EBA, Pazos CJ,Gimeno MA. Point-of-care lung ultrasound in three neonates with COVID-19. European Journal of Pediatrics. 2020;179(8):1279-1285.
6. Brat R, Yousef N, Klifa R, Reynaud S, Aguilera SS, et al. Lung ultrasonography score to evaluate oxygenation and surfactant need in neonates treated with positive airway pressure. JAMA Pediatr. 2015;169(8):e151797
7. Ma X, Zhu J, Du L. Neonatal management during the coronavirus disease (COVID-19) outbreak: the Chinese experience. NeoReviews. 2020;21(5):293-97.
8. Dumpa V, Kamity R, Vinci A N, Noyola E, Noor A, et al. Neonatal Coronavirus 2019 (COVID-19) infection: A case report and review of literature. Cureus. 2020;12(5):e8165.
9. Rose DUD, Peirsigilli F, Ronchetti P M, Bersani I,Santisi A, Dotta A, et al. Novel Coronavirus disease (COVID-19) in newborns and infants: what we know so far. ITAL J PEDIATR. 2020;46(1):56.
10. Neonatal complications of coronavirus disease (COVID-19) study. British Paediatric Surveillance Unit, Royal College of Paediatrics and Child Health, 2020.
11. Yu Y, Chen P. COVID-19 in neonates and children. Front Pediatr. 2020;8(5):287.
12. Wang L, Shi Y, Xiao T, Fu J, Mu D, et al. Chinese expert consensus on the perinatal and neonatal management for the prevention and control of the 2019 novel coronavirus infection. Ann Transl Med. 2020;8(3):47.
13. Manar Al-lawama. Neonatologists' Challenges during COVID-19 Pandemic. J Clin Med Res. 2020;12(5):323-324