

A Severe COVID-19 Infection in Neonates: A Case Report

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Abstract

Coronavirus disease (COVID-19) is a highly contagious infectious disease. First case was reported at the end of 2019 in China. Children and neonate population appears to be relatively free of the virus. We reported a severe and fatal neonate case of COVID-19 in a 22 days old neonate female due to the delta variant strain during the third wave outbreak. She presented with fever, cough, grunting and diarrhea started 5 days before admission. Physical exam's revealed severe respiratory distress, hypoxia and bilateral pulmonary condensation. PCR test for COVID-19 was positive. Chest X-ray found bilateral infiltrates. Chest CT showed diffuse ground glass images with 75% of lung parenchymal involvement. She was treated with antibiotics, corticostoid, respiratory support (CPAP and oxygen). Death occurred after 15 days of hospitalization in the context of multiple organ failure and pulmonary hypertension.

Keywords

COVID-19, Hypoxia, Newborn, Variant Delta, Senegal

1. Introduction

In December 2019, there was an outbreak of an infectious disease in Wuhan in the Hubei Province of China, called Coronavirus disease 2019 (COVID-19) [1]. COVID-19 is highly contagious disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

SARS-CoV-2 is a positive-sense single-stranded RNA virus with a propensity for epithelial cells and the respiratory system [2].

Adults represent the population with the highest rate of infection. Neonate population has so far been relatively free of the virus based on the small number of cases reported in the literature [3].

We report a severe case of COVID-19 due to delta variant in a newborn aged 22 days during the third wave of COVID-19 outbreak in Senegal.

2. Observation

A 22-day-old female infant was admitted for severe respiratory distress. Pregnancy follow up was unremarkable. The mother was primigeste and primiparous. Delivery was normal after 40 weeks of amenorrhea without resuscitation. APGAR score at the first minute was 9/10. Medical history noticed difficulty to breath cough and diarrhea with yellowish liquid stools 5 days before admission. When arrived, weight was 3815 g (-1; -2 SD), height 51 cm (-1 SD and Median), head circumference 36 cm (Median), temperature 38°C. Physical exam's showed severe respiratory distress with tachypnea, Silverman score 7/10, grunting, oxygen saturation 92% (ambient air), bilateral lung crackles, moderate dehydration. Heart exam's was normal and good perfusion. Blood cells count noticed normal leukocyte count at 5400/mm³, normocytic normochromic anemia at 12 g/dl, thrombocytopenia at 145,000/mm³. C-reactive protein (CRP) was negative. Chest X-ray performed (**Figure 1**) showed bilateral infiltrations predominant in the right lung. Rapid COVID-19 test performed through nasopharyngeal swab was positive at the emergency setting. COVID-19 PCR test was also positive and the strain was delta variant. D-dimer was at 580 ng/ml and BNP at 565 pg/ml.

Chest CT (**Figure 2**) showed patchy ground-glass images associated with predominantly lower banded foci of condensation, and lesions extended to 75% of the lung. Blood culture was negative. She was isolated in COVID-19 unit. She received respiratory support (CPAP oxygenation with FiO₂ 50%), antibiotics (oral azithromycin 10 mg/kg die, intra veinous cefotaxim (50 mg/Kg tid), corticosteroïde (bethamethasone: 0.5 mg/Kg/D), zinc 10 mg/D, nutrition by oropharyngeal tube (breast milk feeding). Clinically she showed no really improvement the first 5 days. She was stationary first week. Chest CT repeated (**Figure 3**) at 6 days of admission found no improvement and accentuation on lung lesions. Respiratory distress and high need of oxygen persisted in treatment (CPAP bubble with 50% O₂ and antibiotics).

After 10 days of admission she was worsening and respiratory distress increasing. We suspected nosocomial infectious and vancomycine was introduced. She received a blood transfusion. Renal and heart failure occurred. Heart ultrasonography performed found pulmonary arterial hypertension. She required nasotracheal intubation at day 12 and sildenafil treatment. Multivisceral failure and death occurred at day 15 of hospitalization.

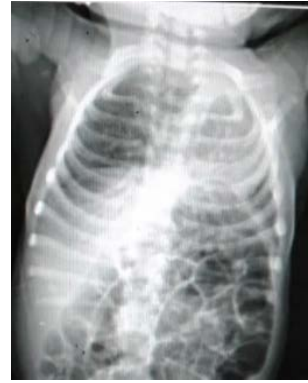


Figure 1. Chest X-ray showed bilateral infiltration predominant in the right lung.

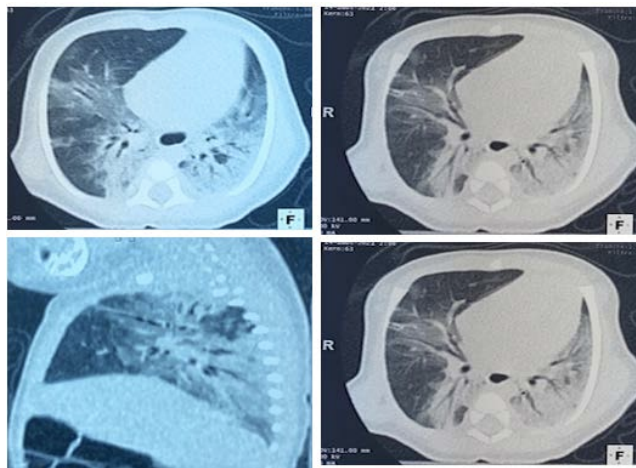


Figure 2. Chest CT (at admission). Chest CT (**Figure 2**) showed patchy ground-glass images associated with predominantly lower banded foci of condensation, and lesions extended to 75% of the lung.

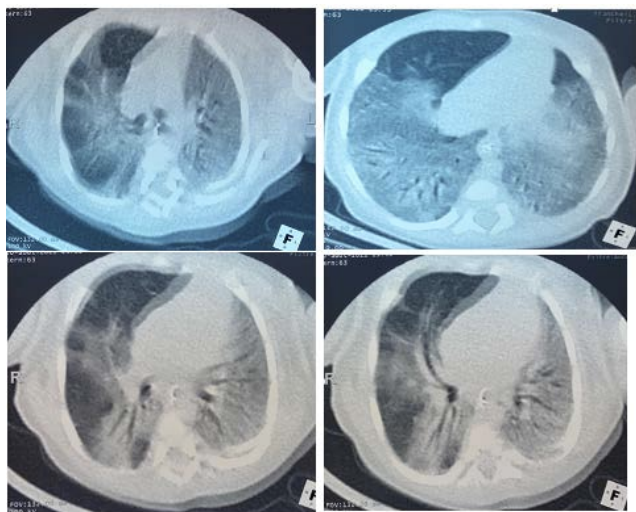


Figure 3. Chest CT (repeated at 5 days) showed of admission showed no improvement and accentuation on lung lesions.

3. Discussion

Coronavirus disease (COVID-19) was firstly reported at the end of 2019. Epidemiological data reported that adults represent the population with the highest rate of infection. Neonates, children and elderly patients can also be infected with SARS-CoV-2 [4].

In the United States, 22% of the affected population are infants, children and adolescents under the age of 18 years [5]. Children represent a small proportion (<2%) of COVID-19 cases, including hospitalizations and deaths [6]. Neonatal population appears to be relatively free of the virus [3] [7]. Symptoms in infected neonates and particularly premature infants are less specific and less clear than in adults. Most children infected by SARS-CoV remained asymptomatic. According to the available data, COVID-19 in children appears to be usually mild. A minority of children with COVID-19 require hospitalization [8]. Fever, cough and gastrointestinal symptoms are the most common reported symptoms in children [9]. Common symptoms such as respiratory distress syndrome, fever or hypothermia, gastrointestinal manifestations are common in severe children's COVID-19 cases [10]. Our patient presented with fever, cough, severe respiratory distress associated diarrheal.

SARS-CoV-2 is mainly transmitted via respiratory droplets. The virus is spread through the respiratory droplets of infected persons by sneezing, coughing or talking without covering the mouth and nose [2] [11]. Several studies have been conducted on the mode of transmission of COVID-19 in newborns. Vertical transmission cannot be completely excluded, but is very low [3] [7] [12]. In our patient, the most likely mode of transmission was horizontal transmission. Symptoms started in our patient at day 16 after birth. The mother COVID-19 PCR test was negative in the postpartum period. Although the clinical manifestations of COVID-19 in children are generally less severe than in adult patients, young children, especially infants, are vulnerable to COVID-19 infection [13]. Children are very sensitive to the delta variant strain. Our patient had severe distress with hypoxia, anaemia, thrombocytopenia and elevated cardiac enzymes and pulmonary hypertension requiring mechanical ventilation. According to Zhu, these findings are very common in neonates infected with SARS-CoV-2 [14]. There are no clear recommendations about the management of children with COVID-19 [15]. Our patient had received course antibiotic, combined with corticosteroids, rehydration, oxygenation and respiratory support.

4. Conclusion

COVID-19 is a highly infectious disease. The neonate population has been relatively spared to date. However, rare cases of severe forms have been reported in the literature due to the severity of delta variant strain particularly in the third wave of COVID-19 outbreak.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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