

Neonatal COVID 19 Pneumonia: report of the first case in a preterm neonate in Mayotte, an overseas department of France

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Abstract

We report the first case of COVID 19 pneumonia in a preterm neonate in Mayotte, an overseas department of France. The respiratory distress with typical thoracic imaging lesions appears at 14 days of life. This case-report emphasizes the need for a cautious and close up follow-up for asymptomatic neonates born to mothers with COVID-19 infection. Vertical transmission cannot be excluded in this case.

Key -Words: COVID-19, preterm neonate, pneumonia, vertical transmission

Manuscript

Introduction

On December 31, 2019, the China Center for Disease Control and Prevention (CDC) reported an outbreak of pneumonia of unknown causes in Wuhan city¹.

This pneumonia was linked to a novel coronavirus, the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), named Coronavirus Disease 2019 (COVID-19)². This disease (COVID19) spread rapidly to many countries all over the world in a few months with currently a pandemic state. The first cases detected in Europe were reported from France on January 24, 2020.

In Mayotte, one of the French overseas departments in the Indian Ocean with a population estimated at 25.6500 and a significant birth rate of 10000 births per year.

COVID 19 infection was first reported on March 14th, 2020. At the date of 14 may 2020, the French public health agency (Santé Publique France) has identified 1210 cases of COVID 19 in the island³.

Little is known about clinical characteristic and outcomes in neonates, especially preterm infants. We report in the present paper the first case in Mayotte so far, of neonatal COVID-19 in a preterm infant who showed clinical symptoms and presumably vertical transmission. This case highlights the need for a cautious extended follow up as well as clear and evidence based guidelines.

Case report

A 36-year-old multiparous woman, with a history of chronic bronchopneumonia and gestational diabetes, was admitted to delivery emergencies unit for active labor at 33 weeks of gestation.

On admission, her body temperature was at 37.4°C, respiratory and hemodynamic parameters were within normal ranges. Maternal antibiotic therapy and intramuscular corticosteroids for fetal pulmonary maturation were not administrated due to a rapid labor that lead to the vaginal birth with meconium stained amniotic fluid of preterm male infant. Short after delivery, the mother developed persistent cough and dyspnea, so she was suspected of COVID 19 infection, droplet and contact precautions were immediately initiated. Nasopharyngeal swab RT-PCR of the mother was positive for SARS-COV2 (130000 copies/ul) and her thoracic CT scan showed typical lung COVID

19 lesions. The neonate was born weighing 1830 g with an Apgar score of 5 at 1 min, 7 at 5 min, and 9 at 10 min. Skin-to-skin contact with his mother was not performed, he was transferred to the neonatal intensive care unit (NICU) on non-invasive intermittent positive pressure ventilation. He was in a closed incubator throughout his admission, and the mother's access was not permitted in the NICU as she was symptomatic. On admission, he was clinically stable on non-invasive intermittent positive pressure ventilation with a mild transient respiratory distress that resolved within 24 hours, fractional concentration of oxygen in inspired air (FiO₂) remained 21%. Furthermore, he was exclusively formula-fed and was given prophylactic intravenous antibiotic therapy (Cefotaxim and Gentallin) that has been stopped at 48h as the blood culture was negative and the C-reactive protein (CRP) was normal. Nasopharyngeal swab RT-PCR was performed at 24 hours of life and showed positive result for SARS-COV2 with a viral load of 918000 copies/ul. The RNA extraction was done with the QIA symphony DSP Virus/pathogen Midi Kit (QIAGEN®). The chest X ray showed normal lung aeration without pneumonia (**figure 1**).

The infant remained stable and was switched to nasal continuous positive airway pressure at 2 days of life for 48 hours, followed by a period 72 hours of respiratory stability in ambient air.

At day 7 of life he began to show minimal signs of subcostal retraction without desaturation that evolved into a subacute respiratory distress with fever without alteration of hemodynamic status at day 14 of life, symptomatology that is described in the clinical evolution of the virus.

Thoracic CT scan revealed ground glass opacities and consolidations (**figure 2**), echocardiogram showed a mild pericardial effusion (3 mm). A new nasopharyngeal swab RT-PCR was performed at 14 days of life and was positive for SARS-COV2. Laboratory tests are reported in **Table 1**. Nosocomial infection has been ruled out, high nasal flow cannula was initiated and oral Azithromycin was administered at the dose of 20mg/kg/day at 14 days of age for 5 days. A nasopharyngeal swab RT-PCR was negative at 21 days of life. At one month of life, he still needs high nasal flow without supplemental oxygen (FIO₂ 21%).

Discussion

Mothers with COVID-19 infection may present with obstetrical complications such as preterm labor, premature rupture of membranes, intrauterine growth restriction and neonatal deaths. In our case, preterm labor is presumably linked to mother's COVID infection, as there was no other evident cause. In neonates, mother COVID19 infection may cause severe acute respiratory distress, and biological disorders including thrombocytopenia and abnormal liver function⁴. Laboratory tests in the present case showed normal liver function and platelet count. Many cohort and case studies have strongly supported the absence of vertical transmission^{4,5,6,7,8}. However, Lan Dong *et al.*⁹ reported a possible in utero infection in a newborn with elevated Ig M antibodies to SARS-CoV-2 born to a mother with COVID-19 disease. The mode of transmission in our case is most likely to be vertical given the short time of SARS-CoV-2 positivity after delivery (24 hours), the absence of skin-to-skin contact at birth and throughout admission, and the absence of mother visits as she was symptomatic. In addition, the baby remained in a closed incubator with droplet and contact precautions, as COVID-19 was suspected during delivery; therefore, it seems unlikely that the infant was infected by nosocomial spread of aerosolized virus or by an infected health-care worker. Breastfeeding was excluded as the route of transmission as the infant was exclusively formula-fed.

However, our report has some limitations including the single case, the vaginal delivery and the absence of PCR testing of amniotic fluid, placenta and umbilical cord, as well as the mother's vaginal secretions.

Transmission through breastfeeding needs to be elucidated. In our unit, the use of maternal expressed breast milk is contraindicated in mothers with COVID19. Skin-to-skin contact is not permitted given the benefit-risk balance. More studies are therefore needed in order to provide accurate evidence based management guidelines.

In the present paper, we noted a symptom-free interval between initial transient respiratory distress that was most likely related to the preterm birth, and the secondary respiratory distress at the 14th days. This emphasizes the need for a cautious and close up follow-up for asymptomatic neonates born to mothers with COVID-19 infection.

Conclusion

Premature infant from COVID-19 mother infection may have COVID-19 infection, presumably *via* a vertical transmission. Further studies are needed to confirm this route of transmission. It should be kept on mind the need for an extended and cautious follow up for asymptomatic neonates with COVID 19 as symptoms may appear secondarily.

Conflicts of interest

None

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	1 day of life	7 days of life	14 days of life
WBC cells/ul	11500(5000-20000)	-	18200 (5000-20000)
Lymphocytes (giga/l)	-	-	5620 (2000-11000)
Platelets, x 10	125000	-	151000
CRP mg/L	<5	<5	<5
PCT (ng/l)	-	-	0.18 (0-0.5)
Ncov RNA throat Swab	Positive	Positive	Positive
Créatine Kinase (UI/L)	-	-	165
Aspartate amino transferase (UI/l)	-	-	48 (25-75)
Alanine aminotranferase (UI/l)	-	-	18 (13-45)
Blood cultures	Négative	Not done	Not done

Table1: Biological findings in neonatal enfant.

WBC: white blood cells; CRP= C reactive protein; PCT: procalcitonin;

RNA: ribonucleic acid



Figure 1: Chest X ray of the neonatal infant with a transient respiratory distress on admission

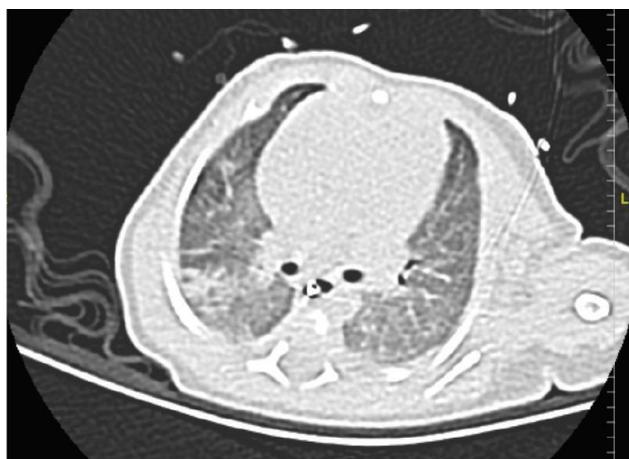


Figure 2: Chest CT scan at Day 14 of life, showing consolidation and ground glass opacities

