

Case Report

A newborn with coronavirus (COVID-19) disease: A brief report

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Abstract. There are few neonates reported with COVID-19 disease. To date there is no clear evidence of vertical transmission of the virus before birth. We report a 4-day old infant born to an asymptomatic mother who developed infection with SARS-CoV-2, likely from contact with parents during the postnatal period.

1. Case report

A 33-year-old woman at 39 weeks of gestation was admitted for elective repeat C-section. The pregnancy has been uneventful. Both mother and father had no history of travel or known COVID-19 exposure. All prenatal laboratory tests are negative. On admission the mother's temperature was 98.2°F (36.8°C), pulse 87 beats/min, blood pressure 113/70 mm Hg and respiratory rate 20 breaths/min.

A full term baby girl was delivered via uncomplicated C-section. There was a nuchal cord which was easily reduced and delayed cord clamping was performed after delivery. Baby weighed 3180 g (7lb 0.2oz) and had Apgar scores of 8 at 1 minute and 9 at 5 minutes. After delivery, the neonate was admitted to regular nursery care, rooming in with mother in a single patient room and exclusively breast-fed. Initial newborn examination was normal with neonatal pustular melanosis and erythema toxicum rash, which resolved in the next few days. On the postpartum

floor, each mother-infant pair has their single-patient room. On day of life 4, the day of discharge, infant was noted to have circumoral cyanosis during feeding. On the same day, mother's temperature was 100.2°F (37.9°C) and later 100.4°F (38°C), pulse 93 beats/min, blood pressure 123/63 mm Hg, respiratory rate 20/min. Mother did not have cough, shortness of breath, sore throat or any respiratory symptoms. Father reported symptoms of sore throat and cough. Nasopharyngeal swabs were obtained from the mother and tested for Influenza A/B, RSV, and COVID-19. Mother was started on Augmentin for presumed endometritis. Mother's viral test results were available after 24 hours and reported positive for COVID-19 and negative for Influenza and RSV. Mother was transferred to negative pressure room under full airborne, droplet and contact isolation. All staff who have cared for the mother and infant up to this point of the hospital stay were appropriately screened for COVID-19. Mother continued to remain asymptomatic and her temperature soon normalized. She was discharged home on postpartum day 5. Mother reported mild cough on postpartum day 7 at home, but she otherwise remained asymptomatic during her home quarantine period. The father was tested and was positive for COVID-19.

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Table 1
Laboratory results

	Reference Range	Mother hospital day 2	Infant hospital day 4	Infant hospital day 6
White cell count (k/cu mm)	4.5–11.00	10.69	15.48	13.57
Hemoglobin (g/dl)	12.0–15.0	8.4	19.8	18.5
Hematocrit (%)	36.0–46.0	26.5	56.7	54.8
Platelet count (k/u mm)	150–350	207	350	266
Neutrophil %	40–70	66.7	57	41
Lymphocytes %	24–44	20.4	18	27
Band %	3–12		3	1
C-reactive protein (mg/liter)	0.0–1.0		0.6	
Sodium (mmol/L)	133–144		140	137
Potassium, plasma (mmol/L)	3.4–6.0		5.4	6
Chloride (mmol/L)	98–107		107	106
Carbon dioxide (mmol/L)	23–27		20	17
Glucose (mg/dl)	55–115		82	78
Urea Nitrogen (mg/dl)	7–20		9	11
Creatinine, plasma (mg/dl)	0.5–1.6		0.42	0.35
Calcium (mg/dl)	8.4–10.2		10.9	11.1
Total protein (g/dl)	5.9–8.1			7
Albumin (g/dl)	3.5–5.0			4.2
Alkaline phosphatase (U/L)	38–126			126
Aspartate amino trans (U/L)	14–59			63
Alanine amino trans (U/L)	9–72			29
Bilirubin, total (mg/dl)	0.5–1.5		13.7	15.2

On hospital day 4 (77 hours of life) the infant was admitted to the neonatal intensive care unit (NICU) due to episodes of desaturations with feedings and while sucking on a pacifier. Infant was placed in a negative pressure room under airborne, droplet and contact precautions while the mother was being evaluated for her fever. While in the negative pressure room, the baby was also placed inside an incubator (with no added heat) to minimize aerosolization of any respiratory secretions while mother was being evaluated as a person under investigation (PUI) for COVID-19. On admission the infant's vitals were: temperature 98.1°F (36.7°C), pulse 137 beats/min, blood pressure 77/47 mm Hg, the respiratory rate 33 breaths/min, and the oxygen saturation 99–100% on room air. Complete blood count, comprehensive metabolic panel and blood culture, were performed on admission (see Table1). Blood culture is negative. Infant consistently had circumoral cyanosis with desaturation episodes, worse with feedings. A 60-hour polysomnography study showed periodic breathing pattern with oxygen desaturations to 70–80%, some clustering of events consistent with feeding-related desaturations but there were isolated non-feeding related desaturation events also noted. Her desaturation episodes gradually decreased and the last desaturation event was noted on day of life 8.

After the mother tested positive for COVID-19, nasopharyngeal swabs from the infant were sent on

day of life 5 and came back positive for COVID-19 on day of life 6. On day 7 the baby developed significant nasal congestion and secretions with audible “snorting” but no distress. Lungs were clear on auscultation with good air entry bilaterally. On day 9, infant continued to have moderate to large amount of nasal secretions, which were described as “greenish” in color and “pouring from the nose”, with intermittent tachypnea and mild subcostal retractions. Oxygen saturations remained 95–97% on room air. Chest x-ray was unremarkable with no focal abnormal findings. To relieve the nasal congestion, baby was started on heated, humidified nasal cannula flow at 4 L/min with 21% oxygen with significant improvement in nasal congestion and secretions. On day 9, baby had a temperature of 99.7°F (37.6°C) and 100.3°F (37.9°C) while in the incubator (with no added heat). The baby was double wrapped with 2 blankets, and after removing one blanket her temperature normalized without any further intervention. The baby continued to exclusively receive mother's milk feedings, which she pumped at home and sent to the hospital where it was transferred to a clean container before being fed to the baby via a bottle. Over the next few days the baby developed relatively loose stools which gradually improved and resolved after 3 days. Nasal congestion gradually improved with decreased nasal secretions and the heated humidified nasal cannula flow gradually weaned and discontinued on hospital

day 13. Nasopharyngeal swabs for COVID-19 was repeated on day 12 and remained positive. Infant was discharged home to parents on hospital day 14 of life with full instructions for baby care at home.

2. Discussion

The outcomes of neonatal population born to mothers with COVID-19 remain unclear [1]. To date, few neonatal COVID-19 positive cases have been reported [2–5]. Most of neonates born to mothers with COVID-19 remain uninfected or with mild symptoms. We report a case that a healthy term infant, has been rooming in with asymptomatic parents and exclusively breast-feeding for 4 days, developed symptoms that require NICU admission and intervention. This case represents an early-onset (<7 days of age) neonatal infection with COVID-19, the transmission route is most likely due to postpartum contact with the caregivers. Overall the infant remained clinically stable during her hospital stay. Most of her symptoms are mild: oxygen desaturations with feedings; borderline hyperthermia, increased nasal secretions, nasal congestion, and loose stools. The long term effects of the COVID-19 infection in newborns and how long they continue to shed the

virus or if there is any residual disease remains unknown.

Disclosure statements

The authors declare that they have no conflict of interest

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