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Horizontal transmission of COVID-19 to a preterm baby during hospital stay: Case report

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Abstract
The outbreak of coronavirus disease 2019 (COVID-19) over the past year has affected public health worldwide. With the emergence of COVID-19 infection, neonates were also rarely reported to have been infected. However, the mode of transmission is usually horizontal. Most neonates with SARS-CoV-2 infection were asymptomatic or presented mild symptoms. We are presenting here a case of preterm neonate as a confirmed case of COVID, who presented with respiratory and gastro-intestinal complains.

Keywords: Neonate, COVID, preterm

Introduction
The infection caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) has resulted in significant morbidity and mortality across the globe [1]. It poses an additional threat to individuals with pre-existing immune compromise [1]. Though the newborns constitute an immunologically naïve population, the effects of covid 19 on them have not been as devastating as they were feared to be [2]. The preterm babies due to their prolonged NICU stay may however, be at risk of getting horizontal transmission during active transmission phase of the virus in the community. In addition, the presentation in this vulnerable group may not be as characteristic as seen in older individuals [2].
Here we describe a case of covid 19 in a preterm baby who presented with features of feed intolerance and subsequent apneic episodes after having been stabilized on enteral feeds and being weaned off from oxygen support.

Case report
A very preterm (30weeks and 4 days, 1340gm) appropriate for gestational age male baby was born through normal vaginal delivery to a G2P1+0L1 mother who was hospitalized for onset of preterm labor. There was no history of preterm labor in previous pregnancy nor any other systemic disease in mother. The mother received appropriate antibiotic prophylaxis, an IM dose of dexamethasone and tocolytics however the labor progressed leading to delivery. The baby was vigorous at birth and was shifted immediately to the NICU for protocolized management. The vitals at admission were- Spo2 87% on room air, Heart rate 169, Respiratory rate 81/min with visible subcostal and intercostal retraction and audible grunting, CRT < 3sec and Temp 36 °C. The baby was immediately put on bubble CPAP (5 cm, 5 liters, 40% FiO2). IV caffeine, IV antibiotics and IV fluids were started.
The baby improved gradually and was weaned off from CPAP on D8 of life. The baby was started on trophic feeding through gavage and the feeds were further escalated in the next few days. The baby improved clinically and started gaining weight of approximately 10-20gm/day from day 12 of life (D12 wt-1360gm). IV antibiotics were stopped and oxygen support was gradually tapered.
On Day 17 of life, the baby had an episode of apnea for which expectant management was done. Baseline investigations for evaluation of apnea were done in the form of blood for sepsis screening as well as arterial blood gas analysis.

The patient was started on IVF and antibiotics as a presumptive case of Hospital acquired sepsis. There were no positive results except for slightly raised lactate and CRP (18.9 mg/l).

Chest radiograph and cranial USG screening showed no significant abnormality. Covid RTPCR was sent through oropharyngeal swab which came out to be positive. The patient had 3 more episodes of apnea within the 48 hours of first apneic episode. The patient was shifted to pediatric covid isolation ICU and was managed on HFNC and did not require intubation. The reports of serial lab investigations are as shown in the table.

Table 1: The reports of serial lab investigations

	At Admission	Diagnosed with COVID	The end of COVID isolation period
Hb (gm/dl)	18	14.2	14.7
TLC (10^3/$mm^{3)}$	32	12.1	7.4
DLC (%)	N71L28	N45L55	N57L43
Platelets (10^3/$mm^{3)}$	231	156	171
CRP (mg/L)	2.3	18.9	1
D-dimer (ng/mL)	-	1214	344
pH	7.20	7.42	7.35
PCo2 (mmHg)	44	37	35
Po2 (mmHg)	55	72	78
Lactates (mmol/L)	4.6	6.7	1.2
Blood sugar (mg/dL)	77	88	101
Bicarbonate (mmol/L)	21	18	23
Blood Urea (mg/dL)	12	14	10
Creatinine (mg/dL)	0.67	0.73	0.48
ALP (U/L)	-	123	84
AST	-	23	34
ALT	-	27	30
TSB(Direct)	-	6.08 (0.79)	5 (0.3)

The baby had no further apneic episodes after 5th day from the first apnea. The IVF was tapered and feed was gradually built up to the total day wise requirement. At the time of writing the report, the baby was clinically stable, was gaining weight and was shifted out from covid isolation ward.

Discussion

To the best of our knowledge, though few reports of Neonatal COVID presenting as apnea are described from other parts of the world the same presentation has been reported from our country in a very few case reports.

At the advent of pandemic, a case was reported of an infant, who presented with life-threatening apnea at home. SARS COVID was confirmed on nasopharyngeal swab and patient improved with minimal support [3].

Authors from US have reported a case of healthy two-week infant contracting the infection and presenting with apnea. Domestic exposure or by community spread was thought to be the mode of transmission [4].

A meta-analysis has reported the most common symptoms in neonatal covid were respiratory (52%) with abnormal lung imaging in 64% of cases. Among the infected neonates 70% were infected through environmental transmission, probably through the hands of care giver [5].

Another review on neonatal Covid cases demonstrate asymptomatic and mildly symptomatic presentation in this group. Most common clinical feature in neonates were respiratory difficulty 74% followed by fever 63%. Some neonates have gastrointestinal symptoms in the form of feeding intolerance, diarrhoea and abdominal distension were present in approximately half of the cases. Neurologic manifestations symptoms in the form of irritability, hypertonia, lethargy, and hypotonia were present in 53%. [6].

Rarely however they may have more severe respiratory manifestations even warranting support with mechanical ventilation. The presented case showed milder manifestation in the form of abdominal distension and feed intolerance with uneventful recovery. The later episodes of apnea too were not explained with usual causes of apnea as seen in premature infants. The presentation of covid 19 infection in preterm babies as necrotizing enterocolitis has also been described in recent case reports [7]. The baby eventually improved on expectant management.

Apnea without underlying cause in neonates during an epidemic of COVID infection do warrant an evaluation for infection with SARS-CoV-2. The present case signifies the importance of following meticulous droplet precautions especially when caring for the vulnerable groups. Preterm babies on account of prolonged hospital stay are theoretically at increased risk of exposure. The manifestations in this group may be protean. This warrants a high index of suspicion on the part of treating neonatologist for investigating Covid 19 in absence of other possible diagnoses.

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