Clinical Pearl: Management of a Symptomatic COVID-19 Positive Pregnant Woman and Her Newborn Infant

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Case Presentation

KM is a male newborn of 39 5/7 weeks' gestational age born to a 31yo G4P3013 mother. Maternal history is significant for sickle cell trait, psoriasis, which was untreated during this pregnancy, and latent tuberculosis, which was treated three years ago. She received adequate prenatal care, and her prenatal labs were unremarkable: O+, antibody negative, HIV negative, RPR non-reactive, rubella immune, gonorrhea negative, chlamydia negative, hepatitis B surface antigen-negative, GBS negative. The pregnancy was complicated by COVID-19 diagnosed 12 days prior to delivery with a positive test when the patient's mother developed cough and fatigue. She had been in self-quarantine at home for 12 days prior to delivery and was cleared by her primary care physician (PCP) given her lack of fever and greater than ten days since the onset of symptoms.

The patient's mother presented to labor and delivery with leaking fluid, frequent and regular contractions, and good fetal movement. She continued to have cough and congestion, and given her history of a positive SARS-CoV-2 test; she was enrolled in the institution's "PUI" pathway. She was placed on special respiratory precautions and was tested again for SARS-CoV-2, which resulted in a positive screen 7 hours after admission.

Our patient was delivered by cesarean section after a failed trial of labor after cesarean (TOLAC) secondary to failure to descend and fetal intolerance of labor with deep variable decelerations. The rupture of membranes was 14 hours prior to delivery with clear fluid. The NICU team was present for the delivery and donned full PPE, including N95 masks, gowns, and eye protection per hospital guidelines, given the positive COVID status. They reported that the infant cried spontaneously at birth and assigned APGAR scores of 9 and 9 at one and five minutes. Cord gases were within the normal range.

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Hospital policy at the time recommended the separation of infants from SARS CoV-2 positive mothers after delivery. Infants are monitored in isolation rooms in the NICU during their hospital stays, and breast milk expression is encouraged. This patient's mother initially planned to separate from her infant but later refused separation, and the infant roomed in with her. We recommended that she wear a mask at all times, keep the patient at least 6 feet from her except during feeds, and practice hand hygiene prior to all encounters with the infant. We encouraged the mother to give her newborn pumped breastmilk. For COVID-positive parents who choose to breastfeed directly, we recommend that they be masked and gowned (except for the exposed breast) and to practice good hand and skin hygiene.

KM had an unremarkable hospital stay. He received intramuscular vitamin K, erythromycin eye ointment, and hepatitis B vaccine. He passed a CCHD screen but failed his hearing screen bilaterally and was referred for repeat testing as an outpatient as well as CMV screening with his PCP. He had a circumcision on postnatal day of life 1, which he tolerated well. Discharge bilirubin was in the low intermediate risk zone. His physical examination was normal, and he had normal vital signs during his hospitalization.

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Per hospital protocol, KM was tested for SARS-CoV-2 at 24 hours after birth with a negative result. He was discharged home on day 3 with a prolonged hospital stay due to maternal observation. She experienced peripartum hypoxia for several hours requiring supplemental oxygen with a normal chest radiograph and normal post-partum course after discontinuation of oxygen. She was discharged home on Lovenox®. At the time of discharge, KM had lost 3% of his birthweight and was taking PO formula well with normal stools and voids.

He was discharged home with his mother, where he will live with his father and two older siblings. Our hospital guideline recommended continuing separation of KM from his mother at home while she is symptomatic as well as good hand hygiene.

Of note, KM had an abnormal newborn screen, which was positive for amino acid disorders. The repeat screen was negative. He has been seen regularly by his pediatrician, who reports that he is doing well without any sequelae from his mother's infection.

Discussion

The management of the mother and infant at the University of Chicago is consistent with guidelines published by the American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics at present (1,2). That is to say, the AAP Guidelines, which recommended the separation of COVID-19 positive mother and her infant, have just been revised such that mother and infant do not need to be separated as long as mother

and her infant are clinically stable (1,2). Here is a summary of the revised AAP rooming-in recommendations:

Rooming-in recommendations

The AAP offers the following guidance for rooming-in:

- Follow the usual practice of the birth center.
- Mothers with confirmed or suspected COVID-19 should maintain a *reasonable distance* from their infants when possible. While performing hands-on care, mothers should wear a mask and use hand hygiene. An isolette may facilitate distancing and provide added protection; take care to latch isolette doors properly to prevent infant falls.
- Health care workers should wear gowns, gloves, standard procedural masks, and eye protection when providing care for well infants. When this care is provided in the same room as a mother with COVID-19, health care workers may opt to use N95 respirators instead of standard procedural masks, if available.
- Mothers who are acutely ill may not feel up to providing all care for their babies. They might need to be temporarily separated or have the infant cared for by another, healthy caregiver in the room.
- Noninfected partners or other family members present during the birth hospitalization should use masks and hand hygiene when delivering hands-on care to the baby.

As outlined in an editorial by Gupta and colleagues, the management of pregnant women with COVID-19 and their newborns continues to evolve (3). Perlman et al. present a prospective initiative of mothers admitted to labor and delivery with universal testing, with 31 of 326 (9.5%) mothers testing positive for COVID-19 (4). Of these mothers, 15/31 (48%) were asymptomatic, and 16/31 (52%) were symptomatic (4). All of their newborn infants were also tested and were negative (4). Twenty-nine newborns roomed in with their mothers, were breastfed as per their mother's choice, and were discharged with their mothers at one to two days of age. Two premature infants were admitted to the Neonatal intensive care unit and managed with continuous positive airway pressure (CPAP) and were not intubated. They were testing serially and remained negative, as well (4). The authors outline their preparation precautions for delivery, delivery room management, and transportation of infants as well as precautions in the NICU (4).

It is clear that the preparation, precautions, and management of pregnant women and their newborn infants will continue to evolve with more clinical experience. In a new editorial published in JAMA Pediatrics, Yanhong and colleagues from Australia emphasize this as well and discuss aspects of the management, breastfeeding recommendations, and state the evidence for vertical transmission of COVID-19 from mother to infant is "not convincing" (5). Thus far, I think investigators around the world also agree (2,5). They also discuss the need for large mother-infant dyad cohorts to further clarify the natural history of COVID-19 infection and long term outcomes (5).

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