A COVID-19–Positive Neonate Born to a COVID-19–Negative Mother: Should Asymptomatic Newborns Be Tested?

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CCOVID-19—caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)—has become a global pandemic causing unprecedented disaster in both developing and developed countries. As of July 28, 2020, the Centers for Disease Control and Prevention (CDC) estimated that the total number of COVID-19 cases in the United States was approximately 4.2 million, and that the US death toll associated with COVID-19 had reached 147,672, with both numbers increasing each day.¹ As case numbers have grown, so have concerns about the effects of COVID-19 on mothers and their newborns, yet little knowledge is available regarding the infection's effect on neonates.

The performance of presently available diagnostic tests for COVID-19 is also uncertain, and debate exists over whether vertical transmission from a mother to a neonate is possible. For neonates who have positive results on their initial COVID-19 test, the American Academy of Pediatrics recommends follow-up testing of combined throat/nasopharynx specimens at 48- to 72-hour intervals until 2 consecutive negative test results are obtained.² As the COVID-19 virus is still rapidly spreading, more cases of pregnant women with suspected or confirmed infection will be seen. As a result, most health care facilities are discharging

mothers and their infants earlier compared with prior usual practices in an attempt to reduce COVID-19 infection rates. Decisions must be made regarding optimum testing and management strategies. We report the management conundrum involving the case of a newborn boy whose initial nasopharyngeal test results were positive for COVID-19, born to a mother suspected to have COVID-19 but whose test results were negative.

CASE REPORT

A boy who had been born at 41 weeks of gestation via vaginal delivery with vacuum assistance to a 30-year-old nulliparous mother was admitted to our newborn nursery.

Prior to birth, his mother had received adequate prenatal care, and all maternal laboratory test results were negative, including syphilis rapid plasma reagin, hepatitis B surface antigen, HIV, and group B streptococcus tests. At the delivery, Apgar scores were 9 and 9 at 1 and 5 minutes, respectively. The neonate was placed in the regular nursery with standard precautions and routine nursing care. The child was appropriate for gestational age, and physical examination findings were remarkable only for a cephalohematoma over the left frontoparietal region. The newborn was screened for hyperbilirubinemia, and there were no concerns. He tolerated his formula feeds without issues, and he was well-appearing overall.

The child's mother developed a fever a few hours after having given birth. Due to the present epidemiology of SARS-CoV-2, a nasopharyngeal swab was sent to detect the virus. Once the mother was tested and became a person under investigation (PUI), both the mother and the newborn were moved to a negative-pressure isolation room. While in isolation, the mother and newborn were allowed to be in the same room, at least 6 feet apart, while awaiting test results. Strict isolation measures were instituted; full personal protective equipment (PPE) had to be worn by all staff providing care to the mother and newborn. Access to the room was kept to a minimum.

Aside from fever, the mother denied having any other COVID-19–related symptoms such as dyspnea, cough, chest

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pain, ageusia or anosmia, or body aches. As per hospital policy, because the mother was a PUI, the newborn's nasopharyngeal swab for SARS-CoV-2 was sent 24 hours after birth. The initial COVID-19 results were negative for the mother and positive for the neonate. Two hours after the neonate had tested positive for COVID-19, both the mother and neonate were retested for confirmation. The subsequent test results were negative for both mother and neonate. The initial test collected from the neonate was repeated, and the results returned as negative. The laboratory protocol for contamination was then initiated, and the machine was inspected to rule out contamination of the machine itself. Repeated test results of the mother and newborn at the postnatal visit (7 days after birth) remained negative. The manufacturer (Abbott Molecular) was not contacted; however, the manufacturer has noted that the test kit has a 5% false-positive rate.

Testing at our institution is done using the COVID-19 real-time reverse-transcription polymerase chain reaction (RT-PCR) technique, which has been authorized for emergency use by the US Food and Drug Administration during the COVID-19 outbreak.³ The test is for the qualitative detection of nucleic acid from SARS-CoV-2 in upper and lower respiratory specimens. The lowest concentration of SARS-CoV-2 genome copies (cp) per μL that can be detected by the COVID-19 RT-PCR test 95% of the time is 6.25 cp/ μL . A false-negative result may occur if inadequate numbers of organisms are present in the specimen or if a specimen is improperly collected, transported, or handled. Due to low cross-reactivity for other microorganisms, a false-positive may result from cross-contamination with a COVID-19–positive specimen.³

DISCUSSION

To date, there is limited evidence supporting intrauterine vertical transmission of COVID-19 from infected mothers to their fetus.^{4–6} Additionally, evidence has shown that when healthy children are infected with SARS-CoV-2, they tend to have a significantly milder disease course compared with adults.⁷ Many children may even be completely asymptomatic. A recent review done by the Chinese Center for Disease Control and Prevention showed that approximately 16% of children ranging in age from 1 day to 15 years exhibited no symptoms at all.⁷ Infants and children at risk for severe disease include those with underlying health conditions including chronic lung disease, cardiovascular disease, and immunosuppression.⁸

Transient separation of mothers testing positive for COVID-19 from their newborns has been postulated to minimize transmission from mother to infant.⁹ However, this separation should not be taken lightly: mother-child bonding is disrupted, causing an interruption in skin-to-skin contact, which may disrupt newborn physiology.¹⁰ In addition, breastfeeding is negatively impacted, which may inhibit the maternal milk flow.¹⁰ This separation may also contribute to maternal and infant stress.¹⁰ Lehnig and colleagues¹¹ have reported that impairment of the

maternal-child bonding can lead to long-term disturbances in the mother-child relationship and the child's social-emotional development. Therefore, if COVID-19 testing were to be done as part of routine inpatient perinatal maternal care, and the mother tests positive for COVID-19, is testing asymptomatic newborns warranted? If testing is done in the neonate, it should be repeated or confirmed before calling it a positive result. Additionally, some mothers and babies are even discharged while COVID-19 results are pending. Some would argue that the information would be beneficial to know so that, if indicated, the family should be quarantined to abate the risk of community spread. Furthermore, parents can take precautions with the newborn by wearing protective masks and avoiding unnecessary contact such as kissing the newborn.

SUMMARY

Testing of asymptomatic newborns for COVID-19 should be carefully considered if the mother has positive COVID-19 test results. Several factors may play role in determining whether testing is indicated (eg, household members, parental comorbidities, infants at risk for severe disease, etc). The risks and benefits must be weighed on a case-by-case basis. Physicians should use clinical judgment in making the decision to test asymptomatic newborns. ■

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