

Optimizing management of the mother-newborn dyad in the COVID-19 era

Melissa M. Medvedev, MD MSc^{1,2}

1. Department of Pediatrics, University of California San Francisco, San Francisco, CA, USA
2. MARCH Centre, London School of Hygiene & Tropical Medicine, London, UK

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has resulted in over 11.6 million cases and 538,000 deaths as of July 7, 2020.¹ The US is the worst-affected country, with more than 2.9 million cases.¹ Evidence is limited regarding transmission risk, clinical presentation, and consequences of SARS-CoV-2 among neonates of infected mothers. Risk of vertical transmission appears to be low, consistent with other coronaviruses.² SARS-CoV-2 has been detected within 48 hours of birth among newborns of positive mothers;^{3,4} however, this may represent horizontal transmission. Early reports indicate that SARS-CoV-2-positive neonates usually have mild disease.^{3,4} Analyses to date suggest that breastmilk is unlikely to be a source of infection.⁵

Guidance regarding care of neonates whose mothers have confirmed or suspected COVID-19 is conflicting. The World Health Organization and Royal College of Obstetricians and Gynecologists recommend that mothers and newborns room-in and breastfeed, with appropriate precautions, emphasizing that the benefits of breastfeeding outweigh potential risks of transmission.^{6,7} The American Academy of Pediatrics advises separation of mothers and newborns from birth, with expressed breastmilk feeding by uninfected caregivers until criteria are met.⁸ In *The Lancet Child and Adolescent Health*, Salvatore and colleagues⁹ make an important contribution to the literature on management and infection control practices for affected mother-newborn dyads.

Salvatore and colleagues⁹ report the findings of an observational cohort study describing management and outcomes of 120 neonates born to 116 (8%) SARS-CoV-2-positive mothers at three hospitals in New York City over an 8-week period. All newborns were allowed to room-in with mothers and breastfeed, if medically appropriate. Newborns were kept in a closed isolette 6-feet apart, except during feeding. The analysis included 82 (69%) newborns who completed follow-up at day 5-7. Sixty-eight (83%) newborns roomed-in and 12 (15%) required intensive care admission, 7 (9%) of whom were preterm. Sixty-four (78%) newborns were breastfeeding at day 5-7 and 45 (85%) were breastfeeding at 1 month.

The study by Salvatore and colleagues⁹ highlights several key messages. In particular, it demonstrates that rooming-in and breastfeeding are safe when accompanied by mask wearing and frequent hand and breast hygiene. It also shows that SARS-CoV-2 transmission to neonates from infected family members is unlikely, with proper precautions. No neonates tested positive by nasopharyngeal swab at 12-24 hours, 5-7 days, or 14 days, and all neonates remained asymptomatic. Forty-seven (60%) mothers were asymptomatic at delivery and 20 (26%) were entirely asymptomatic. In another report, 88% of SARS-CoV-2-positive women were asymptomatic at delivery.¹⁰ There was no difference in neonatal outcome based on maternal symptom presence.⁹ The proportion of neonates born preterm was high (14 [17%]) compared to the national rate (10%). Several studies have suggested an association between SARS-CoV-2 in pregnancy and increased risk of preterm birth. In the UK, 26% of SARS-CoV-2-positive women delivered preterm.⁴ In contrast to this cohort in which 13 (93%) preterm births occurred at 32-36 weeks' gestation,⁹ the UK study reported a notable increase in births at 28-31 weeks' gestation.¹¹ Rising preterm birth rates could pose a significant threat to the health and well-being of children worldwide.

Salvatore and colleagues⁹ should be commended for undertaking this study while responding to COVID-19. To date, this is the largest US cohort of neonates born to SARS-CoV-2-positive mothers and evaluated with serial testing. The authors acknowledge several limitations, including the sample size, follow-up period, and lack of blood, urine, or stool testing. The dynamic state of viral transmission during the peak of the pandemic underscores that this study represents a snapshot in time and setting. Thirty-eight (32%) and 48 (40%) neonates were lost-to-follow-up by days 7 and 14, respectively. Many parents

were fearful of leaving their homes and using public transportation to attend follow-up, highlighting the potential indirect effects of the pandemic on vulnerable populations. COVID-19 outbreaks can rapidly overwhelm the capacity of healthcare systems, resulting in disruption of essential services. Estimates suggest that an additional 56,700 maternal deaths and 1,157,000 child deaths could result if coverage decreases by 45% for 6 months across 118 countries.¹¹ These indirect effects could be more devastating for mothers and neonates than COVID-19.

Salvatore and colleagues⁹ provide valuable data indicating that perinatal SARS-CoV-2 transmission is unlikely and allowing newborns to room-in and breastfeed is safe, with appropriate precautions. Despite these insights, key questions remain unanswered. Robust population-based data are needed to quantify the incidence of complications among pregnant women and neonates, and to understand rates and routes of vertical and horizontal transmission, including asymptomatic transmission. Studies are also required to determine the effectiveness of infection prevention and control practices in the neonatal care setting.

The author declared no conflict of interest.

References

1. Johns Hopkins University Center for Systems Science and Engineering. COVID-19 Dashboard. Baltimore; 2020 [cited 2020 Jul 7]. Available from: <https://coronavirus.jhu.edu/>.
2. Schwartz DA. An Analysis of 38 Pregnant Women with COVID-19, Their Newborn Infants, and Maternal-Fetal Transmission of SARS-CoV-2: Maternal Coronavirus Infections and Pregnancy Outcomes. *Arch Pathol Lab Med.* 2020;144:799–805.
3. Zeng L, Xia S, Yuan W, Yan K, Xiao F, Shao J, et al. Neonatal early-onset infection with SARS-CoV-2 in 33 neonates born to mothers with COVID-19 in Wuhan, China. *JAMA Pediatr.* 2020;174:722–5.
4. Knight M, Bunch K, Vousden N, Morris E, Simpson N, Gale C, et al. Characteristics and outcomes of pregnant women admitted to hospital with confirmed SARS-CoV-2 infection in UK: national population based cohort study. *BMJ.* 2020;369:m2107.
5. Chambers C, Krogstad P, Bertrand K, Contreras D, Bode L, Tobin NH, et al. Evaluation of SARS-CoV-2 in Breastmilk from 18 Infected Women. *Medrxiv pre-print.* 2020 Jun 16; doi: 10.1101/2020.06.12.20127944.
6. WHO. Clinical management of severe acute respiratory infection when COVID-19 is suspected. Interim guidance: 27 May 2020. Geneva; 2020. Available from: [https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-\(ncov\)-infection-is-suspected](https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected).
7. Royal College of Obstetricians and Gynaecologists. National guidance on managing coronavirus infection in pregnancy published. 2020 [cited 2020 Apr 3]. Available from: <https://www.rcog.org.uk/en/news/national-guidance-on-managing-coronavirus-infection-in-pregnancy-published/>.
8. Puopolo KM, Hudak ML, Kimberlin DW, Cummings J, American Academy of Pediatrics Committee on Fetus and Newborn, Section on Neonatal Perinatal Medicine, and Committee on Infectious Diseases. Initial Guidance: Management of infants born to mothers with COVID-19. 2020. Available from: [https://downloads.aap.org/AAP/PDF/COVID 19 Initial Newborn Guidance.pdf](https://downloads.aap.org/AAP/PDF/COVID%2019%20Initial%20Newborn%20Guidance.pdf).
9. Salvatore C, Han JY, Acker KP, Tiwari P, Jin J, Brandler M, et al. Neonatal management and outcome during the COVID-19 pandemic. *Lancet Child Adolesc Health.* 2020;
10. Sutton D, Fuchs K, D'Alton M, Goffman D. Universal screening for SARS-CoV-2 in women admitted for delivery. *N Engl J Med.* 2020;382:2163–4.
11. Roberton T, Carter ED, Chou VB, Stegmuller AR, Jackson BD, Tam Y, et al. Early estimates of the indirect effects of the COVID-19 pandemic on maternal and child mortality in low-income and middle-income countries: a modelling study. *Lancet Glob Health.* 2020;8:e901–08.