Management of mother–newborn dyads in the COVID-19 era

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has resulted in more than 11.6 million cases of COVID-19 and 538,000 deaths as of July 7, 2020.1 The USA is the worst affected country, with more than 2.9 million cases.2 Evidence regarding transmission risk, clinical presentation, and consequences of SARS-CoV-2 among neonates of infected mothers is scarce. Risk of vertical transmission appears to be low, which is consistent with other coronaviruses.3 SARS-CoV-2 has been detected within 48 h of birth among neonates of positive mothers,4 however, this might represent horizontal transmission. Early reports indicate that SARS-CoV-2-positive neonates usually have mild disease.4 Analyses to date suggest that breastmilk is unlikely to be a source of infection.3

Guidance regarding care of neonates whose mothers have confirmed or suspected COVID-19 is conflicting. WHO and the UK Royal College of Obstetricians and Gynaecologists recommend that mothers and neonates room-in and breastfeed, with appropriate precautions, emphasising that the benefits of breastfeeding outweigh potential risks of transmission. The American Academy of Pediatrics advises separation of mothers and newborns from birth, with expressed breastmilk feeding by uninfected caregivers until criteria are met. In The Lancet Child & Adolescent Health, Christine Salvator and colleagues6 make an important contribution to the literature on management and infection control practices for affected mother–newborn dyads.

Salvatore and colleagues6 report the findings of an observational cohort study describing management and outcomes of 120 neonates born to 116 mothers who tested positive for SARS-CoV-2 at delivery at three hospitals in New York City (NY, USA) over an 8-week period between March and May, 2020. All neonates were allowed to room-in with mothers and breastfeed, if medically appropriate. Neonates were kept in a closed isoflote 6 feet (1.83 m) apart from mothers, except during feeding. The analysis included 82 (68%) neonates who completed follow-up at day 5–7 of life. 68 (83%) neonates roomed-in, and 12 (15%) required intensive care admission, seven (9%) of whom were preterm. 64 (78%) neonates were breastfeeding at day 5–7 and 45 (85%) of 53 followed-up at 1 month were breastfeeding.

The study by Salvatore and colleagues6 highlights several key messages. In particular, they show 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, when proper precautions are taken. No neonates tested positive by nasopharyngeal swab at 12–24 hours, 5–7 days, or 14 days, and all neonates remained asymptomatic. 47 (60%) mothers were asymptomatic at delivery: 20 were entirely asymptomatic and 27 had symptom onset more than 2 weeks before delivery and were asymptomatic at delivery. In another report of universal screening for SARS-CoV-2 in women admitted for delivery in two hospitals in New York City, 29 (88%) of 33 positive women were asymptomatic.7 Salvatore and colleagues4 found no difference in neonatal outcome based on maternal symptom presence. The proportion of neonates born preterm (14 [17%]) was larger than that observed nationally (10%).8 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 with this cohort, in which 13 (93%) preterm births occurred at 32–36 weeks of gestation,4 the UK study reported a notable increase in births at 28–31 weeks of gestation.4 Increasing preterm birth rates could pose a substantial threat to the health and wellbeing of children worldwide.

Salvatore and colleagues6 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 absence of blood, urine, or stool testing. Given the dynamic state of viral transmission during the peak of the pandemic, this study represents a snapshot in time and setting. 38 (32%) neonates were lost to follow-up by day 7, and 45 (38%) by day 14. 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

For WHO recommendations see https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected

For UK Royal College of Obstetricians and Gynaecologists recommendations see https://www.rcog.org.uk/en/news/national-guidance-on-managing-coronavirus-infection-in-pregnancy/

For American Academy of Pediatrics recommendations see https://www.aappublications.org/news/2020/04/02/infantcovidguidance040220
even well organised health-care systems, resulting in disruption of essential services. The consequences of such disruptions are expected to be substantial, particularly in low-income and middle-income countries, on the basis of lessons learned from previous viral outbreaks. Estimates suggest that an additional 567 000 maternal deaths and 1157 000 child deaths could occur if coverage decreases by 45% for 6 months across 118 countries. These indirect effects could be more devastating for mothers and neonates than COVID-19.

Salvatore and colleagues⁴ 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 neonatal care.

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Deep learning for neonatal seizure detection: a friend rather than foe

The use of computer-assisted diagnosis is nothing new, as it was proposed in the 1990s,¹ but it was based on systems that required more processing time and were more complex to use. However, in the past decade, this vision has made great strides, not only in medicine, as a result of the development of sophisticated deep-learning methods based on the input of a set of data in a computer that will correlate them more or less independently.² In particular, deep learning offers the benefits of identifying patterns in complex data and out-of-sample prediction and has demonstrated superior performances in solving many problems in various fields of medicine—eg, radiology, pathology, and drug discovery—compared with traditional machine-learning techniques.³

Machine learning applied to epilepsy is still in its nascent stages, but there have been promising results in automated seizure detection from electroencephalography (EEG), imaging analysis, pre-surgical planning, and prediction of medication response and clinical outcomes using a wide range of data sources.⁴⁵ However, few neonatal seizure detection algorithms have been developed to assist health-care professionals with objective decision support.⁶⁷ Newborn babies commonly show a range of movements; some unusual repetitive movements might be mistaken as seizures and the diagnosis of neonatal seizures is often challenging for clinicians.

In The Lancet Child & Adolescent Health, Andreea Pavel and colleagues⁸ present results of the first multicentre trial addressing the performance of an automated seizure detection algorithm (Algorithm for Neonatal Seizure Recognition [ANSeR] software system) supporting

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