

Editorial

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Newborns at risk of COVID-19

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As the pandemic with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) evolves, it is becoming evident that newborns may also be infected and develop coronavirus disease 2019 (COVID-19). Reports of vertical transmission are rare, indicating that transmission from mother to child primarily occurs postnatally. Guidelines and recommendations for handling mother-infant dyads in the immediate postnatal period have therefore quickly been published. It seems the world is divided in regarding how to handle the situation and collaborative global research efforts are greatly needed to determine optimal care.

Are newborns affected by SARS-CoV-2?

So far it seems newborns are more resistant to SARS-CoV-2 than adults. The mechanism for this is not understood; however, it has been suggested that newborns have less mature angiotensin-converting enzyme 2 (ACE2) receptors than adults, the receptor through which the virus enters the cell [1].

Despite only two positive newborn cases by February 2, 2020, the Chinese expert consensus on the perinatal and neonatal management for the prevention and control of the novel corona infection categorized newborn babies as belonging to a high-risk group due to an immature immune system and the possible vertical transmission from the mother to the newborn [2]. Although rare, vertical transmission [3] and even death among young babies have been reported [<https://www.cbsnews.com/news/six-week-old-baby-dies-coronavirus-believed-to-be-youngest-fatality/>].

In a study from China, all neonates born to mothers with COVID-19 from Wuhan in the Hubei province in

China were recruited. Thirty-three newborns were identified, of these only three were COVID-19 positive. Four out of 33 had respiratory symptoms with shortness of breath. The three children who tested positive had a wide range of symptoms such as fever, lethargy, vomiting, and pneumonia, and one who also was preterm [31 weeks' gestational age (GA)] had suspected sepsis. All children had a favorable outcome [4]. In a recent study from Madrid, Spain including 41 COVID-19-positive children, none were newborns [5]. Based on these few data, it may be suggested that COVID-19 in newborns at least in most cases is mild. However, more serious development cannot be ruled out given the paucity of data.

Handling of newborns born to COVID-19-positive or -suspected positive mothers

Different attitudes to handling of newborns born of COVID-19-positive or -suspected positive mothers have since developed. The Chinese are the strictest and require separation between mother and child and no use of maternal breast milk, even in the expressed form [1]. On the other side are the European [Union of European Neonatal and Perinatal Societies (UENPS)] [<https://www.uenps.eu/2020/03/16/sars-cov-2-infection-sin-recommendations-endorsed-by-uenps/>] and World Health Organization (WHO) [6] guidelines that do not recommend separation of mother and child and encourage direct breast feeding with appropriate precautions if the mother has symptoms. Finally, the Centers for Disease Control and Prevention [<https://www.cdc.gov/coronavirus/2019-ncov/hcp/inpatient-obstetric-healthcare-guidance.html>] and American Academy of Pediatrics (AAP) [7] recommend a hybrid approach with separation from the mother and encouragement of expressed breast milk given by a healthy caregiver. Newborn separation at birth for decreasing the risk of newborn infection should be discussed with the mother, optimally prior to delivery as per the AAP. Newborns separated from the mother should be bathed as soon as reasonably possible after birth to remove virus potentially present on skin surfaces. Further,

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infants born requiring neonatal intensive care optimally should be admitted to a single-patient room with the potential for negative room pressure (or other air filtration systems). If this is not available, infants should be maintained at least 6 feet (183 cm) apart and/or placed in air temperature-controlled isolettes. Airborne, droplet, and contact precautions and negative room pressure should be used for the care of infants requiring continuous positive airway pressure (CPAP) or any form of mechanical ventilation [7]. Like the Chinese, the American guidelines go further to recommend that infants with negative testing be discharged home to the care of a designated healthy (non-infected) caregiver. Some main differences between different guidelines are summarized in Table 1.

There are significant pros and cons with the approaches. The majority of current data are from the Chinese experience and it is possible that the lack of transmission is precisely because of their strict policies. European data are only now emerging, and it remains to be seen whether the benefits of rooming in on breastfeeding outweigh the risks of horizontal transmission. Not all hospitals will have the resources to separate mothers and infants and simultaneously support expression of breast milk. Even with adequate support, infant-mother separation as recommended by the AAP will invariably have an effect on breastfeeding success. The AAP acknowledges indeed the difficulty in temporary separation of mother and newborn but emphasizes that separation minimizes the risk of postnatal infant infection and the benefits of separation may be greater in mothers with more serious illness. In many areas of the world, Chinese or AAP guidelines cannot be followed. There is also resistance to separating mother and child and not providing routine breastfeeding as reflected in the European and WHO guidelines [<https://www.uenps.eu/2020/03/16/sars-cov-2-infection-sin-recommendations-endorsed-by-uenps/>, 6]. Many communities

worldwide rely more heavily on breastfeeding than any other health prevention strategy.

The effect on health care givers is also not well described. Guidelines from almost all countries require airborne, droplet, and contact precautions-level personal protective equipment during delivery given the increased likelihood of maternal virus aerosolization. However, after delivery caregivers of mothers may be able to communicate at least partially by phone, possibly preserving valuable personal protective equipment. Caregivers of infants will need to examine and complete necessary newborn screens in person creating greater exposure if the infant is roomed in with the COVID-positive mother. Staff, who not only include nurses and physicians, but also lab technicians, audiologists, and environmental care workers, are not always as familiar with requirements for personal safety and often express great anxiety in these situations.

Finally, data are only now emerging on mothers who are asymptomatic or mildly symptomatic at the time of delivery becoming severely ill in the days following delivery. In a study from New York, COVID-19 disease severity in pregnant women was in 86% mild, 9.3% severe, and 4.7% critical; in fact, this appears similar to that in non-pregnant adults. More notably, over 80% of women without symptoms at delivery went on to have symptoms in the days to follow [8]. COVID-19 affects families and other members in the family, including the father, might also be affected. The risk to the infant from these situations is not trivial, not only because of the risk of horizontal transmission but also from the risk of the infant's primary caregivers requiring medical care themselves. It is imperative that family social supports be discussed regardless of where infants are to be discharged. Global collaborative research efforts are needed to fully understand the implications of these diverse approaches to handling newborns at risk of COVID-19.

Table 1: Differences between guidelines for handling mother-infant dyads in the immediate postnatal period.

Guideline	Mother-infant locations	Maternal breast milk	Supportive data	Follow-up of healthy infant post-discharge
China	Separate	Not recommended	Few affected infants described in consensus report	Quarantine from mother
WHO/UENPS	Room in	Recommended with breast hygiene, direct breastfeeding OK	Data emerging	Infant and mother may be discharged together
AAP	Separate	Expressed breast milk recommended, to be given by healthy caregiver	Data emerging	Quarantine from mother

AAP, American Academy of Pediatrics; UENPS, Union of European Neonatal and Perinatal Societies; WHO, World Health Organization.

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