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EDITORIAL COMMENTARY

Breast Milk and COVID-19: What Do We Know?

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(See the Brief Report by Tam et al on pages 128–30.)

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If the last 6 months have taught us anything, it is how rapidly things can change. Entire ways of life have been disrupted. The health of millions of people has been jeopardized and many have been prematurely lost. Systems put in place over decades have been stretched and sometimes have broken. During these dizzying times, one of the challenges that we face is to know when to let go of previously held understandings, and when to hold tight to that which has long proven to be true. The management of babies born to women with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection or coronavirus disease 2019 (COVID-19) at the time of delivery—including whether to advocate that they breastfeed—provides an important example of the challenges we face in providing guidance in the absence of adequate evidence to inform risk.

Data from across the world relatively quickly revealed that children are not suffering the same quantity and quality of morbidity and mortality as are adults [1, 2]. Reports of neonatal infection suggest that the same holds true for newborns, although international approaches focused on maternal/newborn separation at the time of birth have complicated this assessment [3–8]. Faced with the important question of how to handle babies born to infected mothers, the American Academy of Pediatrics (AAP) provided initial guidance that took the conservative stance of recommending that infected mothers be temporarily separated from their newborns immediately after delivery, and that the babies be fed expressed breast milk rather than directly breastfeeding during the period of high maternal infectivity [9]. The rationale for making recommendations diametrically opposed to those normally made by AAP is that we do not fully know what the risk of infection with SARS-CoV-2 is in the immediate newborn period. At the same time, we do know that neonates have an immature immune system and can suffer severe morbidity and even mortality from viral and bacterial infections. What is missing from this calculus, though, is actual data. That is why reports such as the one in this issue of *Clinical Infectious Diseases* by Tam et al are an important step for obtaining the data we need to fully inform our risk/benefit assessments.

The nutritional and immunologic benefits of breastfeeding are well established. Mother's own breast milk is the normative nutrition for the human infant, and comparison to infants provided alternative feedings provide the reasons why. Both exclusive and complemented breastfeeding during the months after birth are associated with decreased rates of respiratory and gastrointestinal infections in infancy. Although some associations are complex, best evidence associates breastfeeding with decreased risks of childhood obesity as well as specific autoimmune diseases, allergic conditions, childhood cancers, and sudden infant death syndrome [10]. Among preterm infants, human milk feeding is additionally associated with lower incidence of necrotizing enterocolitis and sepsis and improved neurodevelopmental outcomes [11, 12]. For these reasons, the AAP strongly supports feeding infants human milk in its policy statements [11, 12] and manual on infant feeding [13]. There are few instances when infectious disease concerns in the mother lead to a recommendation to not feed breast milk to their infants; these include maternal infection with human immunodeficiency virus, human T-cell lymphotropic virus type I or II, or Ebola virus [14]. Temporary suspension of breastfeeding is suggested when mothers have active herpetic lesions on the breast or are infected with untreated brucellosis. Women with infections that require airborne precautions (eg, tuberculosis, varicella, measles) should avoid contact with the infant, but can feed their infant expressed breast milk [14]. Notably, women living in areas where West Nile virus or Zika virus circulate are recommended to continue breastfeeding [14].

Initial reports did not detect SARS-CoV-2 in breast milk [3, 6, 15–17]. Just prior to Tam et al's report, however, single-subject case reports from China and Germany

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documented the presence of virus in breast milk [18, 19]. All 3 of these studies detected viral RNA by polymerase chain reaction; no efforts were made to grow the virus in cell culture, making it impossible to know if infectious virus was present. The infants from the Tam et al report and the German report [19] tested positive for the virus, but both infants were exposed to their infected mothers and the broader environment in which the mothers acquired their infection—meaning that is it impossible to determine if breast milk was the source of the infants' infection. Importantly, in 2 of the 3 reports, the mothers did not wear a mask while collecting the breast milk sample, raising the possibility of milk contamination from maternal respiratory secretions.

So what should a mother do if she contracts SARS-CoV-2 infection while she is breastfeeding? Current evidence would say she should continue to provide breast milk to her infant. Aligned with AAP guidance for management at birth, while the mother is most infectious, it may be safest for an uninfected caregiver to feed expressed breast milk to minimize the likelihood of respiratory transmission from mother to infant [9]. At a minimum, mothers should use masks and perform breast and hand hygiene if (as will often be the case) there is no unexposed or uninfected alternate caregiver. Breast pumps and components should be thoroughly cleaned between pumping sessions. This approach ensures that the infant continues to receive the known benefits of the mother's own milk, as well as the potential benefit of maternal antibodies against SARS-CoV-2 infection.

For some viruses, such as cytomegalovirus, there are complex relationships between viral acquisition from breast milk, the coincident presence of humoral and cellular components of immunity in the milk, and the development of symptomatic infant infection among term and preterm infants [20–22]. Two issues urgently require study to truly inform the risks and benefits of breast-milk feeding during maternal SARS-CoV-2 infection. First, studies must address whether infectious live virus is ever present in breast milk; if so, the timing of viral shedding in milk in relation to the course of maternal infection will need to be established. Second, the development (or not) of immunoglobulin G and/or immunoglobulin A neutralizing antibody against SARS-CoV-2 requires study. Important issues include the timing of milk antibody relative to maternal infection, as well as whether or not such antibody protects the infant from maternal infection and/or from community sources of infection throughout infancy. Until there is clear evidence that breast milk is a source of SARS-CoV-2 infection and that acquiring infection via breast milk harms the infant, the proven short-term and long-term benefits of breast-milk feeding should be the primary consideration in our parent counsel.

Note

Potential conflicts of interest. K. M. P. was faculty for the Vermont-Oxford Network Webinar on perinatal coronavirus disease 2019 (COVID-19) in May 2020, and is one of the authors of the American Academy of Pediatrics' interim guidance on management of infants born to mothers with COVID-19. D. W. K. reports no potential conflicts of interest. Both authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

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