

Appropriate care for neonates born to mothers with COVID-19 disease

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Abstract

The global COVID-19 pandemic has been associated with high rates of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission, morbidity and mortality in the general population. Evidence-based guidance on caring for babies born to mothers with COVID-19 is needed. There is currently insufficient evidence to suggest vertical transmission between mothers and their newborn infants. However, transmission can happen after birth from mothers or other carers. Based on the currently available data, prolonged skin-to-skin contact and early and exclusive breastfeeding remain the best strategies to reduce the risks of morbidity and mortality for both the mother with COVID-19 and her baby.

KEYWORDS

breastfeeding, COVID-19, essential newborn care, newborn health outcomes, pandemic

COVID-19 is an infectious disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Other coronaviruses that have caused severe respiratory diseases, such as severe acute respiratory syndrome and Middle East respiratory syndrome, have had case fatality rates of 20%-40%.¹ Both resulted in serious complications, such as death and miscarriage in pregnant women and prematurity and intrauterine growth retardation in newborn infants. However, there has been little information on the impact of COVID-19 on maternal and newborn health outcomes and health professionals need clear, practical guidance. In our clinical experience, there has been pressure during the pandemic to separate newborn infants and mothers with COVID-19 immediately after birth and to use formula instead of breastfeeding. Some settings have delivered all babies by Caesarean section, thinking that this will lower the infection risk for newborn infants and staff. This clinical overview describes the rationale for early newborn care for babies born to mothers with COVID-19 based on the currently available data.

There is currently no evidence of vertical transmission from infected mothers to babies. Small case reports have not found the virus in amniotic fluid, umbilical cord blood, vaginal discharge, throat swabs and breast milk.²⁻⁴ The lack of detectable SARS-CoV-2 in breastmilk is consistent with other respiratory viruses, including the 2003 SARS-CoV virus. An increased prevalence of COVID-19 has not been observed among pregnant women, nor have associated congenital anomalies been reported. A Chinese study reported that only 2.4% of 55 924 cases of confirmed COVID-19 up to 20 February 2020 were under 19 years old: 2.5% had severe disease, but none died.⁵ Of 2143 patients under 16 years old, reported by the Chinese Centers for Disease Control and Prevention from 16 January to 8 February, 90% had asymptomatic or mild to moderate disease, 5.9% had severe or critical symptoms and one 14-year-old boy died.⁶

An analysis of 38 women with COVID-19 in the third trimester, including three vaginal births, found that none had severe symptoms or died and none of the 30 neonates tested were positive for

Abbreviations: Ig, immunoglobulin; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

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SARS-CoV-2.⁷ One baby born at 34 weeks and five days had shortness of breath 30 minutes after birth, developed multiple organ failure and disseminated intravascular coagulation and died at nine days old. A throat swab tested negative for SARS-CoV-2.³

Of 33 newborn infants born to mothers with COVID-19 at Wuhan Children's Hospital, 90% were delivered by Caesarean section. All were separated from their mothers and received formula, 13% were premature, 23% were given antibiotics and 13% had respiratory distress. Only three (9%) developed COVID-19: two born at more than 40 weeks developed lethargy and fever on day two and a baby born at 31 weeks and two days required resuscitation at birth and non-invasive ventilation for 14 days. All three cases were positive on days two and four. The full-term babies were negative on day six and the premature baby on day seven. None of the 33 infants died or were admitted to the neonatal intensive care unit.⁸

Newborn infants can be infected after birth. A case study from Wuhan showed that early newborn infections with SARS-CoV-2 can occur even when cord blood, placenta specimens and breastmilk test negative. In this case, the baby tested positive at 36 hours of age, despite being separated from his mother immediately after birth and receiving formula. He was relatively stable during his 17-day hospital stay, apart from vomiting during the first formula feed.⁹ Some newborn infants have acquired the virus from family members¹⁰ and 10 newborn infants in Romania tested positive, even though their mothers were negative, suggesting that they were infected by health professionals.¹¹

Overall, current data suggest that the risk of vertical transmission across the placenta or through breastfeeding is low and that the clinical outcomes for most infected newborn infants are relatively favourable. The fact that some have become infected after being separated from their mothers suggests that separation may not offer significant protection.

This clinical overview looks at whether routine essential newborn care for babies born to mothers with COVID-19 should be maintained or whether different approaches are needed. It is important to make decisions after weighing up any possible benefits against the negative consequences of withholding evidence-based interventions known to improve outcomes for mothers and newborn infants.

The early newborn period is a critical transition from the intrauterine to extrauterine environment. Approximately two-thirds of deaths occur in the first three days,¹² but many could be prevented with simple interventions. Early essential newborn care is a package of simple evidence-based interventions delivered around birth. It starts with immediate and thorough drying and assessment within the first 30 seconds, to prevent hypothermia and stimulate newborn breathing. This is followed by uninterrupted skin-to-skin contact with the mother for at least 60-90 minutes to prevent hypothermia, reduce neonatal infections¹³ and promote early and exclusive breastfeeding.¹⁴ Other benefits include reduced maternal and newborn stress, earlier expulsion of the placenta and reduced maternal bleeding.^{14,15} The third element is delayed cord clamping to prevent

anaemia and intraventricular haemorrhages in preterm infants.¹⁶ Early essential newborn care can reduce neonatal intensive care admissions by up to 30%.^{13,17}

Readiness to breastfeed varies considerably between newborn infants. The mean time of the first breastfeed is around 62 minutes post-partum, and a high proportion requires well over one hour to complete feeding. Longer periods of uninterrupted skin-to-skin contact allow this process to be completed.^{15,18} Furthermore, preventing separation protects newborn infants from the negative consequences of harmful procedures, including early cord clamping, routine suctioning and early bathing, which may slow down their readiness to breastfeed and have other negative health impacts. Most importantly, early separation may increase contact with multiple health professionals who may be infected. These risks are compounded during the pandemic, when reduced staff numbers can lead to greater reliance on less trained staff, increasing the transmission risk. Caesarean sections to reduce the risk of viral infections can often result in early separation and expose mothers and babies to the additional risks associated with surgery.¹⁹ Some settings admit Caesarean births to neonatal units or nurseries for observation and give formula before returning them to their mothers. This practice has led to crowded neonatal units, bed shortages and increased risks of newborn infections and other morbidities.²⁰

Early and exclusive breastfeeding has numerous positive benefits, including the direct transfer of antibodies and immunology factors. In the first few days of life, colostrum contains high concentrations of immunoglobulins, cytokines and immune cells, which provide powerful protection against neonatal infections. One study showed that colostrum can also protect children from pneumonia later in life (risk ratio 2.1, 95% confidence interval 0.5-8.1).²¹ Breastfeeding in the first hour significantly reduces the risk of newborn mortality in low- and middle-income countries compared with feeding delayed for two hours or longer.²² Furthermore, infants who continue exclusive breastfeeding for six months are 5-10 times less likely to die from diarrhoea and 3-15 times less likely to die from pneumonia. Breastfeeding until 24 months has been shown to halve deaths from diarrhoea and pneumonia.^{23,24} There are many additional long-term benefits for both mothers and babies, including improved bonding, growth and cognitive development.

After a SARS infection, immunoglobulin (Ig) M antibodies can be detected in the blood at 3-6 days and IgG after eight days. It is, therefore, feasible that maternal SARS-CoV-2 antibodies can be transferred through the placenta and either confer immunity against the virus or reduce disease severity. In addition, antibodies may be transferred via breastmilk. This is particularly important for IgA isotype antibodies, which do not pass through the placenta. Studies of influenza antibody transfers in preterm babies showed low levels of IgG antibodies transferred via the placenta, with more antibodies transferred in breast milk. In addition, breast milk contains other bioactive molecules, including cytokines and human milk oligosaccharides, which inhibit viral entry into cells.²⁵ Breast milk can also significantly reduce the severity of respiratory syncytial virus infections²⁶ and the frequency of common colds in infancy.²⁷

The potential benefits of evidence-based early newborn care practices are therefore substantial for both mothers and newborn infants. Breastmilk may confer protection against SARS-CoV-2 or reduce disease severity. Limited separation allows prolonged skin-to-skin contact, increases the likelihood of early and exclusive breastfeeding and reduces potential exposure to harmful practices and infected surfaces, staff and carers. The available data suggest that relatively few newborns infants born to mothers with COVID-19 get the disease and those that are infected have good clinical outcomes. These findings support the continued application of early essential newborn care practices that are currently recommended by the World Health Organization.²⁸

Mothers with COVID-19 who keep their newborn infants with them after birth need to adopt appropriate infection, prevention and control practices to limit the risk of infecting their baby. In our clinical experience, this is both feasible and effective. It requires personal protective equipment, hand hygiene resources and careful counselling of mothers and family members on limiting infection risks. Updated facility protocols and environmental changes are also needed to strengthen infection prevention and control practices among health practitioners.

Mothers with COVID-19 should be managed in delivery and recovery areas that are separated from main patient care areas, as outlined by the World Health Organization.²⁹ Early essential newborn care can be applied for both vaginal and Caesarean births if mothers and babies are stable. Staff must apply standard infection prevention and control measures, but the mother remains the main carer if she is well enough and she should be encouraged to interact with her baby and breastfeed. Mothers should wear medical masks, especially when they are in contact with their newborn infants, and wash their hands or use hand sanitiser before and after touching their baby or direct feeding. Surrounding surfaces should be cleaned frequently, and contact with family members should generally be restricted to one key family member. If preterm and low birth weight babies are unable to breastfeed, breast milk should be expressed every two to three hours and administered by cup, spoon or nasogastric tube in line with national policies.

Ideally, larger longitudinal studies are needed to provide definitive data on infection rates of newborn infants born to mothers with COVID-19 managed with and without separation and breastfeeding, for both vaginal and Caesarean section births. This is an urgent priority. However, currently available data suggest that prolonged skin-to-skin contact and early and exclusive breastfeeding are still the best strategies for reducing morbidity and mortality for both the mother with COVID-19 and her baby, in tandem with rigorous infection prevention and control measures.

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CONFLICTS OF INTEREST

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