


## Being a Newborn During the COVID-19 Pandemic

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The coronavirus disease 2019 (COVID-19) pandemic has hit the global community with disastrous consequences for health, economic, and social structures. As the COVID-19 pandemic began to affect all age groups worldwide, the medical community has started to use nearly all of its resources to gain and increase the knowledge about the virus itself, its mode of spread, infection, and course of the disease; and of course suggestions for treatment and better prevention modalities. Due to the immaturity of immune function and the possibility of mother-fetal vertical and aerosol transmissions, even newborns are known to be susceptible to the new type of coronavirus (severe acute respiratory syndrome coronavirus-2, SARS-CoV-2).<sup>1-4</sup> Early in the beginning, nobody had knowledge on SARS-CoV-2 effects on fetus and newborn, therefore, many new questions have arisen in practical life:

- a) Does the virus affect the fetus and result in any congenital abnormality or premature birth?
- b) Should the pregnancy be terminated in case of severe infection of the mother?
- c) Which delivery mode should be performed for the birth?
- d) Which precautions should be taken in the delivery room in case of birth from an infected woman?
- e) Should all newborns born to infected mothers be isolated in neonatal intensive care units (NICUs) and screened sequentially?
- f) Should we keep the mother apart from the newborn or go on with rooming-in?
- g) What about breastfeeding; to continue or to stop?
- h) How should we follow and treat an infected newborn?
- i) How does vaccination of the mother affect the newborn through breastfeeding?

Experiences are the most valuable sources of information in pandemics and the most important weapon for medical workers on the frontline. Turkey is a country where 1.2 million infants are born annually, and in order to fill the knowledge gaps in such a country with high number of births, the Turkish Neonatal Society (TNS) proposed a protocol with the evidence available at the time of preparation to handle newborns with SARS-CoV-2 infections and outbreaks in NICUs. The proposal was published in the Turkish Archives of Pediatrics and translated to different languages by other national societies. The Task Force specially mentioned in the introduction of the proposal that recommendations should be modified based on accumulated clinic evidence and experience because of the limited cases and clinical evidence in neonatal COVID-19 at that time.<sup>2</sup> This was important because the global community of clinicians providing care to newborns in different countries during the COVID-19 pandemic faces significant challenges related to resource availability and training in guidelines adapted to local circumstances.<sup>5</sup>

Nowadays, we know that prenatal care does not require significant modification based on the presence of SARS-CoV-2 infection alone and should be based on the clinical condition of the pregnant woman. The experience of labor and delivery has undoubtedly been altered by COVID-19 with numerous measures in place to protect the safety of pregnant women, caregivers, and newborns.<sup>6-9</sup> The American College of Obstetricians and Gynecologists currently recommends prioritization of testing for pregnant women admitted to labor and delivery units with suspected COVID-19 or who develop symptoms of COVID-19 during admission.

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Additionally, they suggest consideration of universal screening, utilizing rapid polymerase chain reaction (PCR) testing, in high prevalence areas, given concern for asymptomatic infection and transmission.<sup>7</sup> Recommendations state that SARS-CoV-2 infection alone is not an indication for preterm delivery or cesarean section, and timing of delivery should be informed by disease severity, maternal comorbidities, gestational age, and maternal and fetal status, as the majority of SARS-CoV-2 infections are asymptomatic or mild and most individuals make a complete recovery.<sup>7-9</sup>

The TNS founded a Neo-Covid Research Group to evaluate epidemiologic and clinical characteristics of COVID-19 in mother-infant dyads. A multicenter cohort study conducted among newborns born to 125 mothers with COVID-19 in 34 NICUs in Turkey demonstrated that only 3.3% of newborns had a positive PCR test result on the following days after birth. The majority of the newborns (86.4%) born to COVID-19 mothers were followed in isolation rooms in the NICU for a while, whereas others were monitored with a distance of 2 m away from the mother (8.8%) or taken care of by family members in a separate room (4.8%). Depending on the lack of knowledge concerning breastfeeding in the early period of the pandemics, most of the neonates were fed with formula (56.8%) or expressed breast milk (36%), followed by breastfeeding (7.2%) with caution. All neonates with COVID-19 (n = 4) were fed with formula. Oncel et al. commented that in contrast to the recommendations in the TNS proposal, isolation of the patients in the NICU, health status of the mothers, and the anxiety of both parents and physicians on the possible contamination to breast milk could have affected the rate of breastfeeding in their cohort, and suggested that family support should be a part of the care in the NICU.<sup>3</sup> Similarly, the Neo-COVID-19 Research Group from Spain reported a multicenter study showing that only 41.7% of the newborns received exclusive breastfeeding at discharge, which was lower than expected.<sup>10</sup>

One of the major ethical concerns that has emerged from the COVID-19 pandemic is the separation of mothers with suspected or confirmed SARS-CoV-2 from their newborns after delivery. The medical and psychosocial implications of separation after birth are undoubtedly significant. Separation has been hypothesized to interfere with the establishment of breastfeeding and lead to decreased bonding between a mother and her newborn, which may have long-term consequences.<sup>6,11</sup> The WHO does not currently recommend separation of mother and newborn, citing that physiological benefits of breastfeeding and skin-to-skin outweigh the likely limited risk of maternal to newborn transmission, especially in the context of the low virulence within the neonatal population.<sup>12</sup> The TNS proposes that breastfeeding decision may be given individually based on the "mother's health status," and encourages mothers to express their breast milk to establish and maintain milk supply even after they are hospitalized or are apart from their newborns. It includes that while breastfeeding, all possible precautions should be taken to avoid contamination of the virus, including careful hand washing and wearing a face mask, which are universal recommendations nowadays.<sup>2,13</sup> Indeed, current data show that milk produced by an infected mother is a source of anti-SARS-CoV-2 IgA and IgG, which may neutralize SARS-CoV-2 activity and play a protective

role against the transmission and severity of the disease in the infant.<sup>14</sup> Therefore, continuing breastfeeding with appropriate infection control measures is strongly recommended.<sup>13-15</sup>

A recent search in the literature is on vaccination programs and their probable effects on newborns. Baird et al. observed significantly elevated levels of SARS-CoV-2 specific IgG and IgA antibodies in human milk beginning approximately 7 days after the initial vaccine dose, with an IgG-dominant response, and concluded that maternal vaccination results in SARS-CoV-2 specific immunoglobulins in human milk that may be protective for infants.<sup>16</sup> Additionally, Guida et al. showed that in the sample which was collected 7 days after the second dose, anti-SARS-CoV-2 S antibodies were detected in all serum and milk samples.<sup>17</sup> Therefore, vaccinating breastfeeding women can be a strategy to protect their infants from COVID-19 infection.

Clinical presentations of neonates infected with SARS-CoV-2 vary greatly, ranging from asymptomatic carriage to critical illness. Management of SARS-CoV-2 infection in neonates is largely supportive, including respiratory support, oxygen, fluid, and electrolyte therapy, and empiric antibiotics if there is suspected bacterial co-infection.<sup>4,15</sup> The second study of the TNS was a prospective multicenter cohort study including 24 NICUs around Turkey, wherein 37 symptomatic outpatient neonates with COVID-19 were registered in an online national database. The most frequent findings were fever, hypoxemia, and cough (49%, 41%, and 27%, respectively). Oxygen administration (41%) and non-invasive ventilation (16%) were frequently required; however, mechanical ventilation (3%) was rarely needed. Median hospitalization was 11 days (1-35 days). One patient with Down syndrome and congenital cardiovascular disorders died in course of the study.<sup>4</sup>

Current data suggest that the risk of neonatal transmission is low and that neonatal disease most commonly ranges from asymptomatic to mildly symptomatic. Vaccination of the mother and continuing breastfeeding seem to be protective approaches for the newborn. As information is changing rapidly and the knowledge informing best practices in newborns' care continues to evolve, healthcare workers should be aware of the recent developments in the literature.

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