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Key topic areas / questions identified:

Can pregnant patients vertically transmit COVID-19 infection?

Summary of Results

12 studies were reviewed (Total n=194; Majority of sample in China. Other countries: Peru, Italy, & Iran).

Vertical Transmission

- Available evidence suggests that the incidence of vertical transmission is low.^{1-11, 14}
- In China, a retrospective study of 116 pregnant women from 25 hospitals showed SARS-CoV-2 infection during pregnancy is not associated with an increase in spontaneous abortion or preterm birth.⁸
- In Peru, one severe maternal case (Alzamora et al, 2020) of COVID-19 during the 3rd trimester yielded a neonate also positive for SARS-CoV-2.¹¹
- In Iran, two neonates tested positive for SARS-CoV-2 at 1 and 2h after birth suggesting potential vertical transmission.¹²
- In a systematic review and meta-analysis, there was evidence that 27 neonates had SARS-CoV-2 vertical transmission when the infection occurs during the third trimester.¹⁴
 - Pooled portion for this systemic review was 3.2%, compared to studies from China with a 2.0% and studies outside of China with a 2.7%
 - Methods of obtaining SARS-CoV-2 RNA provided different results such as followed:
 - Neonatal cord blood: 2.9% (1/34)
 - Placenta samples: 7.7% (2/26)
 - Amniotic Fluid: 0% (0/51)
 - Urine samples: 0% (0/17)
 - Fecal or Rectal Swabs: 9.7% (3/31)
 - Neonatal serology: 3.7% (3/82)
- A system review of 517 studies found that 33 studies had 205 infants were born to COVID-19 positive mothers. Out of those 33 studies, 6 studies made reports regarding IgG/IgM against SARS-CoV-2 among the infants born. 10 out of the 11 (90.9%) infants had IgG/IgM against SARS-CoV-2. Only one infant (10%) out of the 10 tested positive for COVID-19 virus.¹⁷
- A case report regarding a 37-week pregnant mother in New Delhi, India was exposed to SARS-CoV-2 during the third trimester (34 weeks) on June 8th. During her admission, fetal heart rate monitoring showed no abnormality. Delivery was on July 8th, with a negative RT-PCR test two days prior, mother wearing a surgical mask during labor and the baby had no contact with the mother after birth. At 16hr of life, a pharyngeal swab was positive and only SARS-CoV-2 IgG antibodies were found with no IgM antibodies.¹⁹
- A study described the results of IgM and IgG antibodies in newborns born of six mothers with COVID-19 pneumonia. SARS-CoV-19 was not detected on serum/throat swab by RT-PCR but IgG was elevated in five newborns, along with elevated IgM in two of the newborns.²¹
- In China, a study followed 22 neonates born to COVID-19 pneumonia mothers in Tongji hospital.

Breastfeeding

- Limited available data has shown that breastmilk is unlikely to transmit the virus. A retrospective case series study found that none of the 20 infants breastfed by COVID-19 positive mothers were infected during breastfeeding.¹³
- A study in India looking at 69 COVID-19 positive mothers out of 2,947 deliveries, an overall 7 neonates were tested positive. 51 mothers that were roomed in and breastfeeding their neonates and 4 neonates were positive from that group.¹⁵
- In a systemic review, 19 out of the 77 children receiving breastmilk from COVID-19 positive mother's were tested positive. Ten were reported breastfed, four were mix-fed, two were breast milk substitute and two did not provide information.¹⁶
 - 9 out of 68 analyzed breast milk samples from mothers with COVID-19 were positive for SARS-CoV-2 RNA; of the exposed infants, four were positive for COVID-19.¹⁶
- 18 COVID-19 positive mothers were followed for 3 months and 64 breast milk samples were collected. 1 out of 64 had detectable SARS-CoV-2 RNA, which was collected on day of symptom onset. The viral culture for this sample was negative. Following Holder pasteurization, viral RNA was not detected by RT-PCR that has been spiked with replication-competent SARS-CoV-2.¹⁸
- 242 pregnant women diagnosed with COVID-19 between March 13 to May 31, 2020 during the 3rd trimester were monitored until birth and at 1 month. 235 were present for the 1-month follow-up and it was recorded that 95 (40.4%) were exclusively breast-feeding. During the 1-month period, 23 newborns visited the emergency room and 10 were admitted to the hospital from common causes of the group. RT-PCR was performed on 5 babies due to COVID-like symptoms with negative results in all babies.²¹

Recommendations:

- Multidisciplinary team management with neonatologists is recommended for newborns of mothers with COVID-19 pneumonia⁵.
- Systematic screening of any suspected 2019-nCoV infection during pregnancy and extend intensive follow-up for confirmed mothers and their fetuses⁴.
- Newborns of mothers with suspected or diagnosed COVID-19 infection should be isolated for 14 days after birth and closely monitored.⁵
- The WHO currently recommends that breastfeeding be continued among mothers with suspected or confirmed COVID-19 but should take all possible precautions including washing hands before touching the infant and wearing a mask while breastfeeding.¹³
- Due to the early lack of early trimester data, no assessment can be made regarding rates of vertical transmission in early pregnancy as a potential risk for fetal morbidity and mortality.¹⁴
- Since the neonatal serology positive percentage was close to the overall percentage, it furthers supports that the transmission was vertical rather than after birth.¹⁴
- Due to the negative viral culture for the SARS-CoV-2 RNA positive breast milk sample, it may suggest that breast milk might not be a source of infection for infection. However, larger size studies are needed to confirm this suggestion¹⁸

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