What Effect Does Maternal COVID-19 Infection in the 1st Trimester Have on Fetal Lung Development?

Dr Samantha Carr[1], Dr Christopher Smith[1] & Dr Bronwyn Chan[2]

[1]Department of Obstetrics & Gynaecology, Royal North Shore Hospital, St Leonards, NSW, Australia

[2]Department of Paediatrics, Royal North Shore Hospital, St Leonards, NSW, Australia

BACKGROUND

Current evidence suggests that infants born to mothers with COVID-19 are more likely to be admitted to neonatal intensive care than those born to uninfected mothers[1]. However the majority of these cases involve maternal infection at or around time of delivery with few studies separating cases by trimester.

There have been several reported cases of placental infection with the SARS-CoV-2 virus and there is growing evidence to suggest that even in the absence of fetal infection, placental infection can lead to a fetal pro-inflammatory state impacting on fetal development[2].

CASE PRESENTATION

A 33-year-old primigravida acquired COVID-19 at 6 weeks gestation via community transmission from an infected co-worker. She suffered only mild symptoms. She subsequently had an unremarkable pregnancy with normal antenatal ultrasounds.

Her daughter was delivered via elective Caesarean Section under spinal anaesthesia at 38+6/40 with APGAR scores of 8 and 9 at 1 minute and 9 minutes respectively and weighing 3130 grams (48th centile).

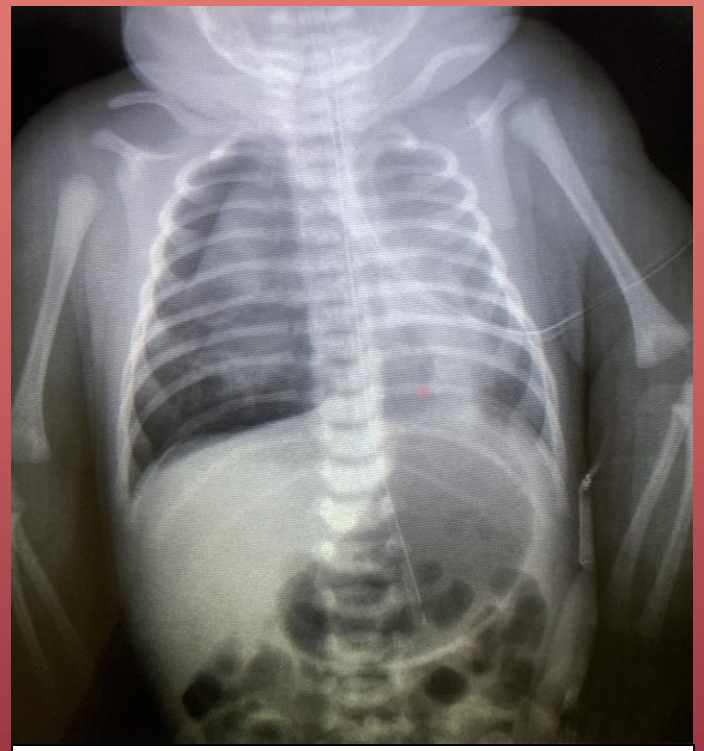

Figure 1: Chest x-ray at 35 hours of age demonstrating large right sided pneumothorax

REFERENCES

Allotey J, Stallings E, Bonet M, Yap M, Chatterjee S, Kew T, Debenham L, Llavall AC, Dixit A, Zhou D, Balaji R. Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: living systematic review and meta-analysis. bmj. 2020 Sep 1;370.

Flaherman VJ, Afshar Y, Boscardin J, Keller RL, Mardy A, Prahl MK, Phillips C, Asiodu IV, Berghella WV, Chambers BD, Crear-Perry J. Infant outcomes following maternal infection with SARS-CoV-2: first report from the PRIORITY study. Clinical Infectious Diseases: An Official Publication of the Infectious Diseases Society of America. 2020 Sep 18.

CASE PRESENTATION (ctd.)

Within 1 hour of delivery the infant experienced acute respiratory distress thought to be secondary to hyaline membrane disease and mild transient tachypnoea of the newborn, requiring 18 hours of continuous positive airway pressure (CPAP).

Sixteen hours after cessation of CPAP the infant desaturated with respiratory distress and was found to have a large right sided pneumothorax requiring chest drain insertion (see Figure 1). She received CPAP for a further 24 hours and then high flow oxygen until 5 days of age. Chest drain was removed with CXR revealing no re-accumulation of pneumothorax.

The infant and placenta were not tested for SARS-CoV-2.

DISCUSSION

This case raises the question of whether maternal infection with COVID-19 in the 1st trimester might impact on fetal lung development. Further trimester-specific evidence is required to fully understand the impact of maternal infection on fetal outcomes.