5.3. Updates on Placental Pathology in the Canadian population in the COVID-19 Era

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Introduction: The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a novel coronavirus that appeared in late 2019. SARS-CoV-2 pandemic has been reported to be associated with severe pregnancy complications including increased risk of intrauterine growth restriction, abortions, preterm labor, stillbirth and abnormal placental pathology such as SARS-CoV-2 placentitis.

Aim: Whether the placental abnormalities are directly induced by Sars-CoV-2 infection or are merely coincidental remains a debate, despite the reported cases supporting the former.

Method: The results of multicentric and multinational systematic reviews and studies (including our experience in Ottawa Ontario n Canada) of the placental pathology findings of SARS-CoV-2 in pregnancy comparing to controls, during and prior to pandemic era are reviewed.

Results: So far, SARS-CoV-2 infection during pregnancy shows a spectrum of findings ranging from unremarkable to severe pathological changes. The latter encompasses an increased incidence of thrombotic events, inflammation and vascular changes in the placenta from SARS-CoV-2 infected women. However, when studies include adequate control groups, including SARS-CoV-2 negative pregnancies during and prior to the pandemic era, most of these placental changes become marginal. Furthermore, the incidence of placental pathology in SARS-CoV-2 positive pregnancies appears when compared geographically. Thus, raising the speculation that such variation may be related to the variability of severity of pandemic impact on different populations.

Conclusion: In our experience in Canada, the commonest placental finding in SARS-CoV-2 positive pregnancy is unremarkable placenta. In some SARS-CoV-2 infection during pregnancy, attributed placental pathologies such as maternal vascular malperfusion, fetal vascular malperfusion, massive perivillous fibrin deposition (MPVD), villitis including chronic villitis, chronic histiocytic intervillositis (CHI) and SARS-CoV-2 placentitis (CHI + MPVD + necrosis of sycytiotrophoblast +/- B cell infiltration) are identified. Except for SARS-CoV-2 placentitis, the placental pathologies, though morphologically nonspecific, show significantly higher incidence of placental abnormalities in SARS-CoV-2-associated pregnancies that delivered during the pandemic versus controls prior to the pandemic era. The variability in the placental pathology findings may be related to the severity of symptoms/viral load of SARS-CoV-2 infection or/and time of maternal infection during pregnancy or/and SARS-CoV-2 variant among other potential causes. Such causes are influence by the impact of the pandemic on different populations.

Objectives:
1. Share the placental pathology impacts of SARS-CoV-2 in pregnancy in Canadian population
2. Compare SARS CoV-2 infection, on placental pathology between European and Canadian population
3. Investigate the placental findings of SARS-CoV-2 cases compared to controls