Committee Opinion No. 400: COVID-19 and Pregnancy

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Disclaimer for the Committee Opinion

Within this Committee Opinion, the members of the Infectious Diseases Committee of the SOGC have attempted to provide general guidance principles for the management of COVID-19 in the pregnant patient. Owing to the diversity of epidemiology of COVID-19 across jurisdictions at any point in time, the adaptation of these principles will vary greatly for individual providers within the context of their current infrastructure and resources. We acknowledge that some providers will still have specific questions that are beyond the scope of these guidelines and we encourage you to consult with local experts if possible, and look at national, regional and institutional resources for up-to-date information on testing and infection prevention protocols. https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html

In December 2019, a novel coronavirus, eventually termed severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was identified in Wuhan, China. As of Sept 2nd 2020 COVID-19 has infected more than 129 000 people in Canada 54,000 thousand deaths.[1] By March 2020, Canada had detected several dozen cases, most of them in returning international travellers or their close contacts.[2] And, by early April over 22,000 cases had been detected nationally, with the majority having been acquired through community spread.[3] Given that pneumonia, sepsis and multi-organ failure are important causes of maternal morbidity and mortality with this disease, the emergence and global spread of COVID-19 has raised concerns about the implications of this outbreak for pregnant individuals and their fetuses. Patients are looking to their maternal care providers for information and guidance on how to prevent or manage infection with COVID-19.

Due to physiologic changes that occur in pregnancy, when compared with their non-pregnant counterparts, pregnant patients with lower respiratory tract infections historically experience worse outcomes, including higher rates of hospital and intensive care unit admission.[4] Since 2002 there have been two other global outbreaks of highly pathogenic coronaviruses: severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS). While SARS and MERS are not identical to SARS-CoV-2 in their genetic structures or clinical manifestations, the recent outbreaks of these viruses may provide insights on the effects of COVID-19 in the context of pregnancy. The literature on SARS and MERS in pregnancy are limited to a handful of case reports and series.[5-10] Many of these cases involved severe morbidity including the need for intensive care and cardiorespiratory support. Notably, there were cases of maternal mortality associated with SARS and MERS infection. The only published case-control study showed that pregnant individuals with SARS experienced worse outcomes than non-pregnant peers of similar age.[11]

Reports varied with respect to the effects of SARS and MERS on pregnancy outcomes. Spontaneous abortion has

been reported among those infected with SARS and MERS during the first trimester.[5] As well, stillbirth, intrauterine growth restriction, and preterm birth have been reported in pregnancies affected by SARS and MERS in the second and third trimesters.[5, 10] It is important to note, however, that a number of pregnancies had good outcomes despite maternal infection with SARS or MERS.[7-9] Broadly speaking, and drawing upon our knowledge of other respiratory illnesses in pregnancy, adverse pregnancy outcomes are most likely related to the severity of maternal respiratory compromise.

To date, the reported case-fatality rate for the general population infected with COVID-19 is lower than that of either SARS or MERS.[4] Evaluation is ongoing to determine whether there are any specific effects of COVID-19 on pregnant individuals and their fetuses. The available data continues to evolve and we now have access to data from increasingly large cohorts of women infected with COVID-19 during pregnancy or the peripartum period. These cohorts suggest that, in general, most pregnant women experience mild to moderate symptoms and have a good prognosis.

Reports to date[12-16] reveal that the proportion of pregnant women with severe or critical illness ranges from 5% to 31%, however comparisons between regions is challenging owing to a lack of application of standard definitions for disease severity. The fact that hospitalization for any reason (including labour) may be categorized as a hospital admission for COVID-19. This is being rectified with a global effort on data harmonization. The majority of these cohorts report estimates of severe and critical disease in pregnant women that is comparable with the non-pregnant population (approximately 80% mild disease, 15% severe and 5% critical).[12] A recent MMWR publication reporting on cases of COVID-19 during pregnancy in the United Stated found that pregnant women have an elevated risk for ICU admission (RR1.6, 95% CI 1.3-1.9) and mechanical ventilation (RR 1.9, 95% CI 1.4-2.6), but risk of death was not different from non-pregnant women (RR 0.8, 95% CI 0.5-1.3). Importantly, the proportion of severe disease identified is strongly related to the denominator used and size of group studied. Depending on site-specific protocols, the population of pregnant women being counted can be highly variable - identified by admitting diagnosis in some centres and by laboratory findings in others, the latter of which may include many asymptomatic cases. . As such, different cohorts will include *de facto*, varying proportions of pregnant women with mild, severe and critical disease and caution is, therefore, warranted when making comparisons between jurisdictions. Local access, care models, indications for supplemental oxygen, caesarean section or ICU admission also highly variable, which further accounts for discrepencies between jurisdictions. What has consistently been reported is that, similar with what has been found in the general population, comorbidities including advanced maternal age (>35y), obesity, diabetes mellitus and hypertension put pregnant women at increased risk of morbidity related to COVID-19.[13-15]

Overall, pregnancy outcomes among the reported cases have been largely good.[7, 17-37] Spontaneous and iatrogenic preterm labour have been the most commonly reported adverse pregnancy outcomes among patients with COVID-19. Rates of preterm birth (before 37 weeks gestation) as high as 30% have been reported from available cohorts.[7, 13, 15, 17-37] Importantly, rates of preterm delivery appear to be proportional to severity of maternal illness with rates of preterm birth close to baseline for the majority of pregnant women with mild COVID-19 disease.[15] Comparison of perinatal outcomes between jurisdictions is limited by the same challenges as for maternal outcomes related to COVID-19. What is consistently reported is that pregnancy outcomes are likely to be closely associated with severity of maternal illness.[15, 29]

Owing to the limitation in generalizing data from other jurisdictions, there is a growing need to have data that is relevant to the population of pregnant women in Canada with universal access to a publicly funded health care system and good capacity for testing symptomatic pregnant patients. To this end, a nation-wide prospective study, CANCOVID-Preg is underway and aims to collect data on the vast majority of women in Canada infected by COVID-19 during pregnancy or in the first 8 weeks postpartum. This project is supported by the Public Health Agency of Canada (PHAC), the SOGC and is funded by the Canadian Institute for Health Research (CIHR). Further information can be found on the CANCOVID-Preg website (https://ridprogram.med.ubc.ca/cancovid-preg/). Data from Canadian cohorts will be forthcoming and will be central to informing prenatal care during the pandemic within the Canadian context.

The available case literature for COVID-19 in pregnancy suggests that similar to knowledge about SARS-CoV-1 and MERS, vertical transmission is unlikely.[17-24, 26, 28-31, 33-37] Furthermore, maternal infection with SARS, MERS, or COVID-19 has not been associated with teratogenicity. However, there is still limited data concerning COVID-19 infection during the first trimester (when embryogenesis occurs), so risk of congenital anomaly associated with COVID-19 cannot yet be excluded. A small number of cases have reported suspicion for vertical transmission, but few have included convincing evidence such as a positive newborn nasopharyngeal PCR within the first 24 hours of life.[38-41] Where newborn testing is performed beyond 24 hours, the possibility of horizontal transmission cannot be excluded and as such, the origin of infection as occurring in utero is less compelling. These represent the minority of studies in a large number of reassuring pregnancy outcomes with negative PCR testing of both the newborn in the first hours of life and other products of conception. The complexity of interpretation of neonatal serologic status also lends confusion to the diagnosis of vertical transmission and until wide spread serologic assays are available, these findings should be interpreted with caution. There may be an association between severity of maternal illness and vertical transmission, as highlighted in a recent Canadian case in which both the mother and newborn had a known immunologic disorder leading to increased susceptibility to infection. Estimating the burden of and risk factors for vertical transmission of COVID-19 is an important priority for the prospective Canadian CANCOVID-Preg study, described above but to date vertical transmission is exceptionally rare and requires unique unusual circumstances

Importantly, there are different interpretations of the risk of postpartum transmission related to cohorting infants with their mother. As this is a droplet and contact transmitted virus, in prior cases of other similarly transmitted infections (influenza, pandemic H1N1, SARS), mothers and infants have usually been cared for together when the mother is well enough to care for her infant and the infant is not requiring neonatal intensive care for its own health. The Chinese[42] and US[43] guidelines recommend immediate separation of mother and infant, whereas the FIGO,[44] WHO,[45] Italian COVID-19 Obstetrics Task Force[16] and RCOG[46] recommend the mother wear a mask, and cleanse hands and body where infant will be in close contact. This represents the highly variable interpretation of the same body of literature. To date, given the significant benefit of breast feeding, and the generally mild disease seen in the paediatric population, we have not recommended separation of mom and baby.

Based on our current understanding of the global outbreak, the following points represent our understanding of COVID-19 in pregnancy with specific recommendations for antepartum, intrapartum and postpartum care.

Antepartum Care

- Obstetrical patients with respiratory symptoms should be asked to wear a surgical mask immediately upon presentation to the health care facility.
- Pregnant patients suspected of having or having been exposed to COVID-19 should be triaged quickly, given a mask to wear, and transferred to a single-occupancy room as quickly as possible.
- Testing should be performed as per local guidelines and recommendations. Pregnancy does not appear to alter test performance.
- Expectant management at home may be appropriate for many pregnant patients. For those requiring admission, droplet/contact infection precautions are adequate.
- Health care providers should consider delaying routine antepartum care appointments for pregnant patients who are being tested for COVID-19. Self-quarantine as per local protocols is appropriate.
- The use of N95 respirators is only required for aerosol-generating procedures (e.g., intubation). The duration and discontinuation of precautions should be determined in accordance with Public Health Agency of Canada guidelines,[47] and provincial and territorial guidance.
- Health care providers can consider empiric antibiotic therapy for superimposed bacterial pneumonia in pregnant patients with confirmed COVID-19 infection or severe respiratory disease. First-line antibiotics are oral amoxicillin for stable patients and ceftriaxone for severe disease, based on general recommendations for the management of pneumonia.
- For maternal surveillance, close monitoring or initiation of an obstetrical early warning system is appropriate.
- Initiation of antepartum corticosteroids for fetal maturation is recommended as per current guidelines[48] if preterm delivery is indicated or anticipated based on maternal condition.
- Antepartum fetal surveillance of confirmed cases of COVID-19 should occur monthly and include fetal ultrasound assessment for growth and anatomy.

Intrapartum Care

- Droplet/contact precautions should be used, including wearing a surgical mask with eye protection, a gown, and gloves.
- Use of N95 respirators should be reserved for aerosol-generating procedures (e.g., intubation).
- Health care personnel in the room should be minimized.
- It is advisable to limit the presence of symptomatic family and household contacts in the delivery suite and visitation should be permitted in accordance with locally developed infection prevention and control protocols.
- Intrapartum fetal monitoring in the form of EFM should be considered given evidence showing fetal distress during labour.
- Cesarean delivery should be reserved for obstetrical indications.
- There is no data to indicate that the second stage of labour generates aerosols and, as such, droplet/contact precautions are sufficient for vaginal delivery.
- Given that intubation is considered an aerosol-generating procedure, consideration should be given for the surgical team to wear N95 respirators for Cesarean delivery, because the need to convert from neuraxial to general anesthesia is often unpredictable. Depending on the supply chain for PPE, it may be necessary to triage the use of N95 based on likelihood of needing to convert to a general anaesthetic and this should be discussed with the entire surgical team prior to surgery.

- There is no evidence to avoid delayed cord clamping or to encourage early cleansing of the infant. Routine practices such as skin-to-skin contact (with the mother wearing a mask and after having washed her hands) and delayed cord clamping should continue.
- Elective Cesarean delivery should be delayed, if possible, until a woman is no longer considered infectious.
- Appropriate patient transfer planning should be made so as to minimize exposure of other patients in the hospital.
- Hospital birth is preferred to home birth for patients who have or are being tested for COVID-19, in light of the challenges associated with ensuring appropriate personal protective equipment in the home setting and the high rates of fetal distress that have been reported in the literature.
- Regardless of the gestational age at which a pregnant woman was infected COVID-19, the newborn infant should be tested for COVID-19 at birth (i.e., nasopharyngeal swab for COVID-19 polymerase chain reaction)

Postpartum and Newborn Care

- Management in the post-partum period should be guided by a patient-centred discussion about the available evidence and its limitations.
- If breastfeeding is chosen, it should be encouraged after appropriate hand hygiene, while the mother is wearing a mask. Cleansing the chest/breast could be considered. Hydration should be emphasized especially in the setting of fever. It is possible for transmission of SARS-CoV-2 antibodies to the infant through breast milk; however, there is limited evidence of this transmission and the protective benefits are unclear. The World Health Organization recommends breastfeeding within the first hour of life if maternal condition permits.[49]
- If maternal choice is to bottle feed, skin-to-skin contact is still encouraged. If the mother is too unwell to provide infant care, support should be offered with pumping, donor milk or formula-based nutrition based on patient wishes.
- We do not recommend universal isolation of the infant from either confirmed or suspected infection in the mother. Evidence shows that rooming-in helps the newborn thrive and that breastfeeding reduces the risk of newborn respiratory infection.[50] Skin-to-skin contact benefits both mother and newborn:[51-53]
    - Decreased maternal anxiety in the immediate postpartum
    - Decreased depression for the first year postpartum
    - Increased uterine tone with decreased bleeding
    - Improved weight gain and sleep quality in the newborn

Given the significant mental health burden of both the pandemic and a diagnosis of COVID-19, prioritizing close contact for the mother-baby unit is of particular importance. Expectations and infant-care supports should be individualized to maternal condition and values.

- Contact with healthcare workers should be minimized and hospital stay should include a prompt discharge plan.[50]
- Discharge counselling should reinforce good handwashing and application of a mask prior to all infant care, with frequent cleaning of high-touch surfaces. Consideration should be given to the mother's ability to access necessary equipment such as masks and provisions should be made accordingly.[49]

Conclusion

In the current COVID-19 pandemic the unique needs of pregnant individuals and their fetuses/newborns need to be addressed. As with any epidemic, data are evolving and a measured approach to management is required. Based on this evidence to date on COVID-19 as well as the literature on outbreaks of SARS, MERS and other emerging pathogens, the SOGC's Infectious Disease Committee has created this committee opinion to help guide maternity care providers in the care of pregnant patients. This guidance is based on the evidence to date and will continue to be updated as more information emerges.

For further information please see attached resource.

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