DOI: 10.1111/aji.13354

EDITORIAL

AJRI American Journal of Reproductive Immunology WILEY

Special issue on COVID-19 and pregnancy: Consequences for maternal and neonatal health

1 | COVID-19 AND PREGNANCY

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) quickly spread worldwide as a once in a century pandemic in the form of a coronavirus disease 2019 (COVID-19). COVID-19 has taken only a few months since it was declared a pandemic by the World Health Organization in March 2020 to affect close to 29 million vulnerable people and inflict approximately 1 million deaths across continents.[1] Initial cases of COVID-19 disease patients were first identified in Wuhan, China, in December 2019 and January 2020. One major factor that has baffled clinicians and scientists is that this pandemic has spread in a sustained manner without a significant reduction in transmissibility. Among the vulnerable populations, pregnant women and their fetuses have traditionally represented a high-risk population during viral pandemics; however, this pandemic demonstrated altered maternal immunity[2,3] and effect on gametogenesis[4] and organogenesis,[5] and placental function.[6,7] To date, the outcomes of several cohorts of pregnant women have been reported, with no definite evidence of mortality and vertical transmission.[8-10] On the other hand, there are reports of preterm deliveries, albeit at a suggested higher rate compared with non-COVID pregnant women, and stillbirth.[9,10] Long-term effects of in utero exposure to COVID-19 are not known.

This Special Issue on COVID-19 and Pregnancy centers around consequences for Maternal and Neonatal Health and presents cutting-edge information on various aspects of basic SARS-CoV-2 infection, placenta as an infectious target, and clinical observations in pregnant women (Figure 1). We hope this issue will be of benefit to researchers globally, interested in the role of COVID-19 in pregnancy complications.

2 | URGENT NEED FOR COMPREHENSIVE INFORMATION ON COVID-19 IN PREGNANT WOMEN

Just in the last few months, there has been an explosion of publications on COVID-19 in general, including those reporting on clinical consequences for pregnant women. However, the information to the general public has suffered from fragmented reports and data derived from small cohorts and even individual cases. In this Special Issue, we have compiled a collection of twelve manuscripts that cover most of the important issues relating to COVID-19 and pregnancy. The manuscripts cover themes on immunology, placenta, receptor biology, risk factors to infection progression, and most importantly clinical consequences.[2-8,11-14] Each review is authored by experts on the specific topic of their respective research and/or clinical work.

3 | SARS-COV-2, IMMUNOLOGY, AND PLACENTA

SARS-CoV-2 belongs to the family of the severe acute respiratory syndrome coronaviruses (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV) and exploits the same ACE2-TMPRSS2 receptor complex as the other coronaviruses.[15] There are some unique observations of COVID-19 disease in pregnant women. Unlike other coronaviruses, SARS-CoV-2–infected individuals remain asymptomatic for 5-7 days. In most cases, pregnant women remain asymptomatic with a rare incidence of mortality. In COVID-19 disease patients, lymphopenia has been correlated with mortality. This poses a question whether pregnancy presents itself as an immunological contributor to severe or controlled COVID-19 disease. No definite evidence of vertical transmission has been presented. This places the placenta at the center of the question of vertical transmission. There have been reports of temporal expression of ACE2 in the placenta, suggesting that the gestational age-dependent ACE2 expression may curtail or enhance vertical transmission.[16,17] Several manuscripts have been included to provide up-to-date information on all these relevant questions.

4 | CLINICAL CONSEQUENCES OF COVID-19 ON MATERNAL AND NEONATAL HEALTH

Several manuscripts have been devoted to review the current data and conceptualize the various factors integral to the understanding of diagnostic challenges, therapeutic controversies, intrauterine transmission, and maternal and neonatal complications. These reviews cover the entire gestation period from disease severity, management

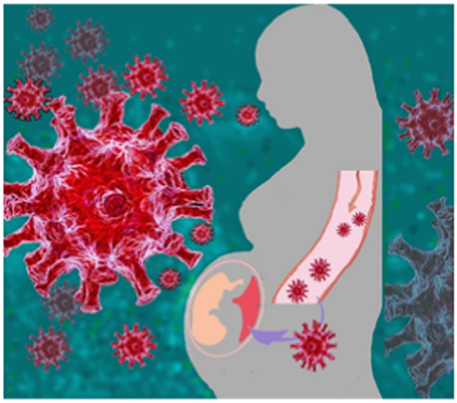

FIGURE 1 Severe acute respiratory syndrome coronavirus 2 infection and pregnancy

considerations for care of severe and critically ill women, overall clinical manifestations of COVID-19 disease, role of co-infections, and prenatal care and labor.

It is important to note that a few manuscripts discuss a country-centric COVID-19 disease in pregnant women and clinical care in respective countries.[8,18]

We believe that manuscripts included in this special issue will provide cutting-edge insights for COVID-19 disease in pregnant women and its effects on maternal and neonatal health.

Surendra Sharma[1]
Irina Burd[2]
Aihua Liao[3]

[1]*Women and Infants Hospital, Warren Alpert Medical School of Brown University, Providence, RI, USA*
[2]*Johns Hopkins University School of Medicine, Baltimore, MD, USA*
[3]*Institute of Reproductive Health, Center for Reproductive Medicine, Tongji Medical College of Huazhong University of Science and Technology, Wuhan, China*

Correspondence
Surendra Sharma, Women and Infants Hospital-Warren Alpert Medical School of Brown University, Providence, RI, USA.
Email: SSharma@WIHRI.org

REFERENCES

1. World Health Organization (WHO). WHO Coronavirus Disease (COVID-19) Dashboard. 2020; https://covid19.who.int/?gclid=EAIaIQobChMIjLnZ-4j06wIV8R-tBh0qBAK9EAAYASAAEgKokPD_BwE. Data last updated: 2020/9/18, 4:01 pm CEST. Accessed September 30, 2020
2. Hanna N, Hanna M, Sharma S. Is pregnancy an immunological contributor to severe or controlled COVID-19 disease? *Am J Reprod Immunol*. 2020;84(5):e13317.
3. Muyayalo KP, Huang D-H, Zhao S-J, Xie T, Mor G, Liao A-H. COVID-19 and Treg/Th17 imbalance: potential relationship to pregnancy outcomes. *Am J Reprod Immunol*. 2020;84(5):e13304.
4. Singh B, Gornet M, Sims H, Kisanga E, Knight Z, Segars J. Severe acute respiratory syndrome-corona virus-2 (SARS-CoV-2) and its effect on gametogenesis and early pregnancy. *Am J Reprod Immunol*. 2020;84(5):e13351
5. Abbas AM, Ahmed L, Salem AS, et al. COVID-19 and hydatidiform mole. *Am J Reprod Immunol*. 2020;84(5):e13310
6. Prochaska E, Jang M, Burd I. COVID-19 in pregnancy: placental and neonatal involvement. *Am J Reprod Immunol*. 2020;84(5):e13306
7. Verma S, Carter EB, Mysorekar IU. SARS-CoV2 and pregnancy: an invisible enemy? *Am J Reprod Immunol*. 2020;84(5):e13308
8. Li W, Yu N, Kang Q, et al. Clinical manifestations and maternal and perinatal outcomes with COVID-19. *Am J Reprod Immunol*. 2020;84(5):e13340
9. Ashraf MA, Keshavarz P, Hosseinpour P, et al. Coronavirus disease 2019 (COVID-19): a systematic review of pregnancy and the possibility of vertical transmission. *J Reprod Infertil*. 2020;21(3):157-168.
10. Khalil A, Kalafat E, Benlioglu C, et al. SARS-CoV-2 infection in pregnancy: a systematic review and meta-analysis of clinical features and pregnancy outcomes. *EClinicalMedicine*. 2020;25:100446.
11. McCartney SA, Kachikis A, Huebner EM, Walker CL, Chandrasekaran S, Adams Waldorf KM. Obesity as a contributor to immunopathology in pregnant and non-pregnant adults with COVID-19. *Am J Reprod Immunol*. 2020;84(5):e13320.
12. Kucirka LM, Norton A, Sheffield JS. Severity of COVID-19 in pregnancy: a review of current evidence. *Am J Reprod Immunol*. 2020;84(5):e13332
13. Chen L, Jiang H, Zhao Y. Pregnancy with COVID-19: management considerations for care of severe and critically ill cases. *Am J Reprod Immunol*. 2020;84(5):e13299
14. Thompson JL, Nguyen LM, Noble KN, Aronoff DM. COVID-19-related disease severity in pregnancy. *Am J Reprod Immunol*. 2020;84(5):e13339
15. Hoffmann M, Kleine-Weber H, Schroeder S, et al. SARS-CoV-2 cell entry depends on ACE2 and TMPRSS2 and is blocked by a clinically proven protease inhibitor. *Cell*. 2020;181(2):271-280.e8.
16. Pique-Regi R, Romero R, Tarca AL, et al. Does the human placenta express the canonical cell entry mediators for SARS-CoV-2? *Elife*. 2020;9:e58716.
17. Bloise E, Zhang J, Nakpu J, et al. Expression of severe acute respiratory syndrome coronavirus 2 cell entry genes, angiotensin-converting enzyme 2 and transmembrane protease serine 2, in the placenta across gestation and at the maternal-fetal interface in pregnancies complicated by preterm birth or preeclampsia. *Am J Obstet Gynecol*. 2020. https://doi.org/10.1016/j.ajog.2020.08.055
18. Sharma JB, Sharma E, Sharma S, Singh J. Recommendations for prenatal, intrapartum, and postpartum care during COVID-19 pandemic in India. *Am J Reprod Immunol*. 2020;84(5):e13336