


Review

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Need for Mandatory COVID-19 Testing among Pregnant Women: Lessons from Routine Testing

Andrew Marvin Kanyike¹ , Shreya Datta², Arbabasu Kalsar²

¹ Faculty of Health Sciences, Busitema University, Mbale, Uganda

² Calcutta National Medical College, Kolkata, India



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Correspondence:

Dr. Andrew Marvin Kanyike, MB ChB
Faculty of Health Sciences, Busitema
University, Mbale, Uganda
Email: andrewmarvinkanyike@gmail.com

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Authors' contributions

The participation of each author corresponds to the criteria of authorship and contributorship emphasized in the [Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly work in Medical Journals of the International Committee of Medical Journal Editors](https://www.icmje.org/). Indeed, all the authors have actively participated in the redaction, the revision of the manuscript, and provided approval for this final revised version.

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ABSTRACT

The coronavirus disease 2019 (COVID-19) continues to ravage the globe, significantly affecting vulnerable groups like people with chronic illnesses and pregnant women. Unlike early in the pandemic, recent evidence indicates that COVID-19 causes various complications in pregnancy like preterm birth and preeclampsia. However, it is unclear how COVID-19 precisely interplays with pregnancy, and which trimester the infection is most detrimental is variable. Some pregnancy-related complications, such as preeclampsia and eclampsia, share similar pathophysiological mechanisms and clinical features to COVID-19; as a result, they present a diagnostic challenge, with one condition being mistaken for the other, leading to poor pregnancy outcomes. We discovered COVID-19 among asymptomatic mothers who later developed complications and those who initially presented with complications based on our experiences performing routine COVID-19 tests, which were published in various case reports. These patients were mostly in their third trimester, and we believe the outcomes would have been worse if COVID-19 had not been detected early and treated promptly. Therefore, this clinical opinion is structured to show how COVID-19 affects pregnancy and which trimester the infection is most detrimental based on the available data to support routine testing of COVID-19 among pregnant women and to maximize benefits while minimizing costs.

KEYWORDS:

COVID-19, Pregnancy, Routine testing of COVID-19 during pregnancy.

1. Pregnancy and COVID-19

For the past two years, coronavirus disease 2019 (COVID-19) has put a strain on global health, particularly on vulnerable groups, such as people with chronic diseases and pregnant women. Special attention is drawn to the coexistence of COVID-19 with pregnancy-related physiological changes and immunocompromised state and their outcomes. Initially, COVID-19 was not associated with serious maternal and neonatal morbidities [1,2]; however, new evidence links it with increased obstetric complications, such as higher rates of preterm birth, preeclampsia, perinatal death, fetal distress, cesarean delivery, miscarriages, and spontaneous preterm birth [3]. Moreover, pregnant women with worse chest radiograph scores and higher levels of laboratory indicators of COVID-19 severity are more likely to be admitted to the intensive care unit [4]. Maternal mortality has also been significantly associated with COVID-19 compared to aged-matched adults [5]. The asymptomatic nature of COVID-19 in some cases, combined with similar pathophysiological mechanisms with some pregnancy-related complications such as preeclampsia and eclampsia, may result in missed opportunities to diagnose COVID-19, resulting in adverse pregnancy outcomes. COVID-19 is primarily a respiratory infection but also causes significant vascular changes through direct endothelial damage-causing coagulopathies and affecting multiple organs, like preeclampsia [6]. Their clinical features

overlap, posing a diagnostic challenge. Furthermore, these effects can result in complications such as severe postpartum hemorrhage and abruptio placentae, which can be well controlled or even avoided if COVID-19 is detected and treated early.

2. Experiences from Routine COVID-19 Testing in Pregnancy

Based on our experience performing routine COVID-19 testing among pregnant women presenting for labor or with pregnancy-related complications at Mal Specialty Hospital, West Bengal, India, as detailed in two case reports on eclampsia [7] and severe postpartum hemorrhage (PPH) [8], early detection of COVID-19 and immediate administration of necessary treatment protocols provided good outcomes; these outcomes could have been worse if COVID-19 was not diagnosed early. In the latter case, the patient was asymptomatic upon presentation but later developed severe PPH that was difficult to control and respiratory distress. In contrast, the patient in the former case presented with symptoms of eclampsia (tonic-clonic seizures and proteinuria) but also tested positive for COVID-19 both on rapid diagnostic test at admission and reverse transcription-polymerase chain reaction (RT-PCR) later on. Both patients responded well to treatment using the COVID-19 treatment protocol at the hospital during admission and were discharged stable.

3. Determining the Pregnancy Trimester to Perform Routine COVID-19 Testing

It is impossible to overlook the efforts made to combat COVID-19 in terms of logistics, such as diagnostics and vaccines, which have presented a challenge to the entire world, particularly developing countries, so routine testing must be targeted to maximize benefit while minimizing costs. Therefore, when to perform routine testing for COVID-19 during pregnancy is a pertinent question to address. The timing of when COVID-19 mostly affects pregnancy is a matter of debate, with discrepancies in evidence from various research studies. From an immunological aspect, during early pregnancy, the maternal blood is exposed to a huge load of foreign paternal fetal antigens and the normal maternal immune system is disrupted; therefore, the first trimester would expectedly be the most susceptible period to COVID-19. Conversely, Zelini and colleagues reported that COVID-19 infection within the first trimester does not seem to predispose to miscarriage and pregnancy losses, and such instances could have been the result of underlying causes [9].

On the other hand, in a longitudinal study, Papageorghiou et al. discovered that diagnosis and risk of COVID-19 among pregnant women with complications like preeclampsia were the highest in the last days of pregnancy (33–37 weeks) [10]. They further argued that the vascular disruptions caused by these conditions, which usually clinically manifest around the same period, predisposed the patients to contract COVID-19 rather than the other way around [10]. It is important to note that the relationship between COVID-19 and pregnancy is still being researched as more evidence becomes available. Notably, both women presented with COVID-19 during the last trimester, at 36 weeks and five days and 40 weeks and two days of gestation, respectively.

Regardless of the uncertainties, the lesson we draw from these studies is that having COVID-19 towards the end of pregnancy or last trimester could lead to poorer outcomes than earlier in pregnancy; therefore, it would seem logical to encourage routine testing during the third trimester or towards the onset of labor.

4. CONCLUSIONS

As more extensive, larger, and longitudinal studies are conducted, providing more data and evidence, action must be taken with available information to avoid preventable maternal and neonatal mortality and morbidity during this pandemic. Focused research on the physiological and immunological effects of COVID-19 at the different pregnancy stages and ultimate outcomes will help us understand better when it is most risky to have COVID-19, allowing us to heighten our vigilance and monitoring to optimize pregnancy outcomes.

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