

## Need for Mandatory COVID-19 Testing among Pregnant Women:

### Lessons from Routine Testing

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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

## 35 **Pregnancy and COVID-19**

36 For the past two years, coronavirus disease 2019 (COVID-19) has put a strain on global health,  
37 particularly on vulnerable groups, such as people with chronic diseases and pregnant women.  
38 Special attention is drawn to the coexistence of COVID-19 with the pregnancy-related  
39 physiological changes and immunocompromised state and their outcomes. Initially, COVID-19  
40 was not associated with serious maternal and neonatal morbidities [1,2]; however, new evidence  
41 links it with increased obstetric complications, such as higher rates of preterm birth,  
42 preeclampsia, perinatal death, fetal distress, cesarean delivery, miscarriages, and spontaneous  
43 preterm birth [3]. Moreover, pregnant women with worse chest radiograph scores and higher  
44 levels of laboratory indicators of COVID-19 severity are more likely to be admitted to the  
45 intensive care unit [4]. Maternal mortality has also been significantly associated with COVID-19  
46 compared to aged-matched adults [5].

47 The asymptomatic nature of COVID-19 in some cases, combined with similar  
48 pathophysiological mechanisms with some pregnancy-related complications such as  
49 preeclampsia and eclampsia, may result in missed opportunities to diagnose COVID-19,  
50 resulting in adverse pregnancy outcomes. COVID-19 is primarily a respiratory infection but also  
51 causes significant vascular changes through direct endothelial damage-causing coagulopathies  
52 and affecting multiple organs, like preeclampsia [6]. Their clinical features overlap, posing a  
53 diagnostic challenge. Furthermore, these effects can result in complications such as severe  
54 postpartum hemorrhage and abruptio placentae, which can be well controlled or even avoided if  
55 COVID-19 is detected and treated early.

## 56 **Experiences from Routine COVID-19 Testing in Pregnancy**

57 Based on our experience performing routine COVID-19 testing among pregnant women  
58 presenting for labor or with pregnancy-related complications at Mal Specialty Hospital, West  
59 Bengal, India, as detailed in two case reports on eclampsia [7] and severe postpartum  
60 hemorrhage (PPH) [8], early detection of COVID-19 and immediate administration of necessary  
61 treatment protocols provided good outcomes; these outcomes could have been worse if COVID-  
62 19 was not diagnosed early. In the latter case, the patient was asymptomatic upon presentation  
63 but later developed severe PPH that was difficult to control and respiratory distress. In contrast,  
64 the patient in the former case presented with symptoms of eclampsia (tonic-clonic seizures and  
65 proteinuria) but also tested positive for COVID-19 both on rapid diagnostic test at admission and  
66 reverse transcription-polymerase chain reaction (RT-PCR) later on. Both patients responded well  
67 to treatment using the COVID-19 treatment protocol at the hospital during admission and were  
68 discharged stable.

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## 70 **Determining the Pregnancy Trimester to Perform Routine COVID-19 Testing**

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

83 On the other hand, in a longitudinal study, Papageorghiou et al. discovered that diagnosis and  
84 risk of COVID-19 among pregnant women with complications like preeclampsia were the  
85 highest in the last days of pregnancy (33–37 weeks) [10]. They further argued that the vascular  
86 disruptions caused by these conditions, which usually clinically manifest around the same period,  
87 predisposed the patients to contract COVID-19 rather than the other way around [10]. It is  
88 important to note that the relationship between COVID-19 and pregnancy is still being  
89 researched as more evidence becomes available. Notably, both women presented with COVID-  
90 19 during the last trimester, at 36 weeks and five days and 40 weeks and two days of gestation,  
91 respectively.

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

96 **Conclusion**

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

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