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COVID-19 Infection during Third Trimester of Pregnancy and its Impact on Fetal Growth

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Abstract: ***This study conducts a retrospective analysis to evaluate the frequency and impact of Intrauterine Growth Restriction IUGR in pregnant women with SARS-CoV-2 infection during the third trimester. The research involved 30 COVID-19 positive pregnant women, excluding those over 35 years of age or with a history of IUGR in the current pregnancy. Utilizing high-resolution B-mode ultrasound, the study assessed fetal biometry, including biparietal diameter, head circumference, abdominal circumference, and femur diaphysis length, to estimate fetal weight. The results indicated a significant presence of IUGR in COVID-19 infected pregnant women, compared to non-infected individuals. The study highlights the importance of early detection of potential adverse perinatal outcomes for effective antenatal care and timely intervention. It contributes to the growing body of evidence suggesting the impact of COVID-19 on fetal development, particularly in the context of the immunocompromised state of pregnancy.***

Keywords: SARS-CoV-2, Pregnancy, Intrauterine Growth Restriction IUGR, Fetal Biometry, COVID-19

1. Introduction

- In December 2019, a pneumonia caused by novel coronavirus (severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2]) emerged in Wuhan, the capital of Hubei province, in China(1).
- Pregnant women are considered high risk for SARS-CoV-2, due to the effects of pregnancy on the immunity response (2).
- There are concerns regarding the association of SARS-CoV-2 and fetal growth restriction (FGR) after maternal infection, due to placental lesions related to acute illness, increased coagulopathy, hypoxia, and placental viral infection.
- SGA foetuses typically have EFW or AC below the 10th percentile, although 5th centile, 3rd centile, –2SD and Z-score deviation have also been used as cut-offs in the literature (3).
- The fetal biometric parameters measured most are biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC) and femur diaphysis length (FL). These biometric measurements can be used to estimate fetal weight (EFW) using various different formulae.
- Maternal history and symptoms, amniotic fluid assessment can provide additional information that may be used to identify fetuses at risk of adverse pregnancy outcome.

2. Materials and methods

- Study Design: Retrospective analysis of COVID-19 positive pregnant women in third trimester
- Duration of study: 1 year duration.
- Inclusion criteria: 1) RT-PCR positive in 3rd trimester of pregnancy; 2)28-40 weeks of gestation as calculated by known LMP.
- Exclusion criteria:1) Age more than 35 years 2) history of IUGR in present pregnancy.
- Materials: High resolution B mode ultrasound done with low frequency probe. And follow up with birth weight.
- Sample size: A total of 30 pregnant women as per the inclusion criteria were studied.
- Sampling methods: Study included all the Covid -19 positive pregnant women during the study period who satisfied the inclusion and exclusion criteria.

3. Procedure

- The patient is made to lie in supine position. The ultrasound examination starts with B mode to image the fetal biometry with EFBW, placental status and AFI.
- Pregnancy characteristics along with fetal outcomes were documented using ultrasound.
- Patients were followed till delivery and the neonatal birth weight was documented.

Data collection methods:

- Data were collected for the study, using a structure case report form. The data were gathered from the history, RT-PCR positive during third trimester of the study participants with known LMP.

Research question:

- To evaluate frequency of IUGR in pregnant women with SARS-CoV-2 infection in 3rd trimester.

Aims & Objectives:

- To detect IUGR in patients with COVID infection in term pregnancy by estimating EFBW in third trimester.
- To study the effect of SARS-CoV-2 infection in fetal growth.

4. Results

- Thirty COVID-19 positive pregnant women with no h/o IUGR were admitted to our hospital in their third trimester with COVID infection during the study period.
- Mean maternal age was 27 years, SD 4.362. Gestational age (GA) ranged from 28-40 weeks of pregnancy with mean GA calculated at 36 weeks with SD of 2.1446.

- 30 women delivered within the study period out of which 28 underwent C- section (93.3 %) and 2 were normal delivery (6.7 %).
- p value calculated for gestational age was 0.007 and showed significant value of IUGR; p value for birth weight was 0.04.
- All neonates tested negative for SARS-CoV-2.

Table 1

Variable	N	Mean	SD
Age	29	27.62	4.392
GA	30	36.373	2.1446
AFI	30	10.517	3.2974

Table 2

Mode of Delivery	Frequency	Percentage
LSCS	28	93.3
Normal	2	6.7
Total	30	100.0

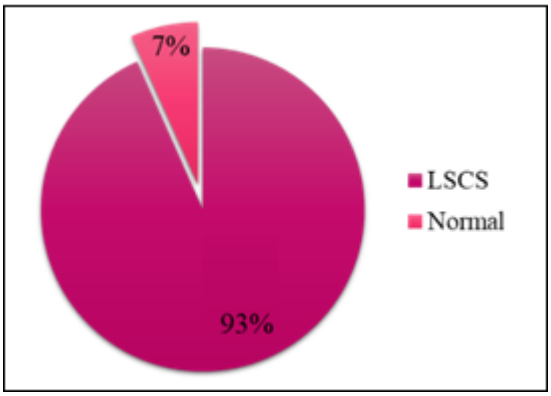

Table 3

	IUGR	N	Mean	SD	Independent t sample t test	p-value
GA	Yes	3	31.700	2.00224	5.801	0.001
	No	27	36.893	1.4196		

*p value was calculated by independent sample t test, p<0.05 considered as significant.

Table 4

	IUGR	N	Mean	SD	Independent t sample t test	p-value
Birth Weight	Yes	3	1.900	0.9539	2.603	0.015
	No	27	2.748	0.4886		

*p value was calculated by independent sample t test, p<0.05 considered as significant.

5. Discussion

a) The COVID-19 infection in pregnancy may have harmful effects due to the partially immunocompromised state. The reference standard for the diagnosis of Corona infection is the real-time PCR. We used nasopharyngeal samples using PCR or SAR-CoV-2 GeneXpert in our study.
b) Our study showed a high incidence during the third trimester. (4)
c) Another complication in pregnancy concerning SARS-CoV-2 infection is IUGR.
d) Even though our population were with the mild form of disease, IUGR in the COVID-19 infected pregnant women were statistically significant when compared with noninfected pregnant individuals (4)

6. Conclusion

a) In clinically high-risk pregnancies, early prediction of adverse perinatal outcome is of most importance for proper antenatal care, start of early treatment and proper timing of delivery.
b) In alignment to other studies, our data shows fetal growth retardation in 16.7% of COVID positive pregnancies in their third trimester.

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