

# Maternal and Neonatal Outcomes in Pregnant Women Presented with or Without COVID-19 Disease

Nazish Ali<sup>1</sup>, Sadia Rashid<sup>2</sup>, Zaib-un-Nisa Quraishi<sup>3</sup>, Aliya Waheed<sup>2</sup>, Saira Ghafoor<sup>2</sup> and Fehmida Saleh<sup>4</sup>

## ABSTRACT

**Objective:** To compare the maternal and neonatal outcomes in patients with or without coronavirus disease.

**Study Design:** Prospective/observational study

**Place and Duration of Study:** This study was conducted at the Obstetrics & Gynaecology department, Liaquat College of Medicine and Dentistry Darul Sehat Hospital, Karachi for duration of six months April, 2020 to September, 2020.

**Materials and Methods:** One hundred eighty patients with ages 18 to 35 years and gestation age >24 weeks were included. Patient's demographical detail including age, residence, education and socioeconomic status were recorded. All the patients were divided into two groups; Group A consists of 90 patients presented with COVID-19 and Group B with 90 patients without COVID-19. Maternal outcomes were recorded. Neonatal outcomes such as admission to NICU, birth weight, Apgar score and mortality were recorded.

**Results:** There were no significant difference in term of age between Group A and B 28.5 years and 28.76 years. Mean BMI in group A was  $25.85 \pm 2.65$  kg/m<sup>2</sup> and in group B it was  $26.89 \pm 2.48$  kg/m<sup>2</sup>. In group A frequency of C-section was higher 56 (62.22%) and in group B it was 24 (26.7%). Frequency of preterm in group A was 22 (24.44%) while in group B was 10 (11.11%). In Group A 33.3% neonates need to NICU. Low birth weight was 26 (28.89%) higher in Group A patients. 4.44% neonatal death was recorded in Group A while none in Group B.

**Conclusion:** The pregnant women with COVID-19 disease had more complications and higher rate of lower segment cesarean section and preterm delivery as compared to normal pregnant women.

**Key Words:** C-sections, Maternal outcomes, Neonatal, Morbidity, Mortality

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## INTRODUCTION

The global pandemic from the extreme acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has grown at an accelerating pace as more than 1 million people are infected. The growing mortality level ensures that vulnerable groups in society are recognised and covered.

Awareness of earlier outbreaks of human body coronavirus, the severe acute coronavirus syndrome (SARS-CoV) and Middle Eastern breathing syndrome (MERS-CoV), implies a specific vulnerability for pregnant women and their foetuses to bad effects. Intensive treatment admission is normal and up to 35 percent mortality rates have been documented.<sup>1,2</sup>

Mother is more vulnerable to serious infections as a result of physiological changes in pregnancy.<sup>3</sup> Anatomical changes, such as a rise in the transverse diameter, and a high diaphragm level, lower maternal tolerance to hypoxia.<sup>4</sup> Change in lung volume and vasodilation may result in mucous oedema and increased secretions in the upper respiratory tract. In turn, cell-mediated immunity changes lead to a growing vulnerability of progressive women to intracellular disease, such as viruses.<sup>5</sup> The immaturity of the inborn and adaptive immune system in comparison to the foetus and the neonate makes them highly susceptible to infections.<sup>6</sup>

The immaturity of the infectant and the adaptive immune systems makes them very vulnerable to infection with the foetus and newborns.<sup>6</sup> Dysregulation of factors such as cytokines and the complement cascade may have deleterious consequences for development of the brain and its function.<sup>7</sup> Therefore, it

<sup>1</sup>. Department of Obstet & Gynae, Liaquat College of Medicine & Dentistry DarulSehat Hospital, Karachi.

<sup>2</sup>. Department of Obstet & Gynae, Jinnah Medical & Dental College/Hospital, Karachi.

<sup>3</sup>. Department of Obstet & Gynae, Life Line Hospital, Karachi.

<sup>4</sup>. Department of Obstet & Gynae, Liyari General Hospital, Karachi.

Correspondence: Dr. Nazish Ali, Assistant Professor of Obstetrics & Gynaecology, Liaquat College of Medicine & Dentistry Darul Sehat Hospital, Karachi.

Contact No: 03118958318

Email: drnazishgeo@gmail.com

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is of special interest to find out whether the infectious agent will infect the foetus or newborn by means of vertical transmission.<sup>8</sup> The possible risk groups in the current COVID-19 pandemic of pregnant women and their infants should be evaluated.

With minimal knowledge on the novel coronavirus and the significantly growing burden of the disease<sup>9</sup>, it is vital to share science about the disease in a succinct and realistic way. Data on the maternal and perinatal results of SARS-CoV-2 infected pregnant women are restricted to a few case reports and episodes. The sample measurements are small and the results differ. Changes to health policies in pandemic nations, ever changing standards and uncertainties about the reliability of the findings make it difficult to grasp the results of these studies.

We intended to perform an in-depth review of the publication of available literature on COVID-19 pregnancies.

## MATERIALS AND METHODS

This observational study was conducted at Obstetrics & Gynaecology department, Liaquat College of Medicine and Dentistry Darul Sehat Hospital, Karachi for duration of six months April, 2020 to September, 2020. A total of 180 patients with ages 18 to 35 years and gestation age >24 weeks were included in this study. Patient's demographical detail including age, residence, education and socioeconomic status were recorded after written consent. Patient's maternal cardiac ailments and less than 20 years of ages were excluded from the study. All the patients were divided into two groups; Group A consists of 90 patients effected by COVID-19 and Group B with 90 patients with negative COVID-19 results. Maternal outcomes were assessed. Neonatal outcomes such as admission to NICU, birth weight, Apgar score and mortality were recorded. Compare the results between both groups. All the statistical data was analyzed by SPSS-21. P-value <0.05 was considered as statistically significant.

## RESULTS

There was no significant difference in term of age between Group A and B 28.5±4.26 years and 28.76±3.44 years. Mean BMI in group A was 25.85±2.65 kg/m<sup>2</sup> and in group B it was 26.89±2.48 kg/m<sup>2</sup>. 50 (55.6%) patients and 56 (62.22%) patients in Group A and B had urban residence while 20 (44.4%) and 37.78% patients in Group A and B had rural residency. 42 (46.7%) patients in Group A and 52 (57.8%) in Group B were prim parous while 48 (53.3%) in Group A and 38 (42.22%) in Group B were multiparous (Table 1).

In group A, C-section was higher 56 (62.22%) and in group B it was 24 (26.7%). Normal delivery was lower 37.78% in group A as compared to group B 66 (73.3%).

The preterm in group A was 10 (22.22%) while in group B was 10 (11.11%) (Table 2).

In Group A 33.3% neonates need to NICU. Low birth weight was 26 (28.89%) higher in Group A patients. 4.44% neonatal death was recorded in Group A while none in Group B (Table 3).

**Table No.1: Baseline characteristics of all the patients**

Variable	Group A	Group B	P value
Age (years)	28.5±4.26	28.76±3.44	>0.05
BMI (kg/m <sup>2</sup> )	25.85±2.65	26.89±2.48	N/S
Residence			
Rural	40 (44.4%)	34 (37.78%)	>0.05
Urban	50 (55.6%)	56 (62.22%)	
Parity			
Primiparous	42 (46.7%)	52 (57.8%)	0.042
Multiparous	48 (53.3%)	38 (42.22%)	

**Table No.2: Maternal outcomes between both groups**

Outcome	Group A	Group B
Term	70 (77.78%)	80 (89.89%)
Preterm	20 (22.22%)	10 (11.11)
Mode of Delivery		
LSCS	56 (62.22%)	24 (26.7%)
Vaginal	34 (37.78%)	66 (73.3%)

**Table No.3: Neonatal outcomes between both groups**

Outcome	Group A	Group B	P-value
NICU admission	30 (33.3%)	6 (6.7%)	0.02
Low birth weight	26 (28.89%)	16 (17.8%)	0.04
Death	4 (4.44%)	-	N/S
Apgar score at 5 min			
<7	8 (8.9%)	12(13.33%)	N/S
>7	82 (91.1%)	78(96.67%)	N/S

## DISCUSSION

The global population of COVID-19 infected people is now rising exponentially with pregnant women being a large proportion of them. Although this significant population is particularly at high risk of negative outcome, data on the effect of COVID-19 on this particularly vulnerable population are limited in the form of case reports and review publications. This is the first of its kind to tackle premature birth, foetal distress and vertical transmission of COVID-19 infected pregnant women in the Indian subcontinent. A total of 38 patients were examined on infected pregnant women, all of whom were in the third pregnancy trimester. Among COVID-19 positive cases, there was a propensity for higher early births. The effect of numerous interleukins released in response to viral infection may be stress, both psychological and physiological. It is appropriate to note that 5 out of 8 pre-term births were born after spontaneous work, as COVID-19 is more likely to lead to premature work, due to normal vaginal delivery.

There was no significant difference in term of age between Group A and B 28.5 years and 28.76 years. Mean BMI in group A was  $25.85 \pm 2.65$  kg/m<sup>2</sup> and in group B it was  $26.89 \pm 2.48$  kg/m<sup>2</sup>. In group A, C-section was higher 56 (62.22%) and in group B it was 24 (26.7%). The normal delivery was lower 37.78% in group A as compared to group B 66 (73.3%). The preterm in group A was 20 (22.22%) while in group B was 10 (11.11%). Our results showed resemblance to the previous some studies.<sup>10-12</sup> As regards the mode of delivery, a caesarean section was undertaken in most cases and the reason for this decision has been cited by several writers as foetal distress.<sup>13-15</sup>

This study showed that in group A 33.3% neonates need to NICU. Low birth weight was 20 (22.22%) higher in Group A patients. 4.44% neonatal death was recorded in Group A while none in Group B. A review of Zimmermann et al<sup>16</sup> found that the intravascular coagulation (3%), asphyxy (2%) and two perinatal deaths have been disseminated by neonatal pulmonary disease (18%). The positive SARS-CoV-2 was identified in four neonates (3 with pneumonia). Another research by Hassan N t al 79% was delivery in terms of term and 21% was delivery in advance. The vaginal delivery (60%) was made, one mother was admitted to ICU, and one died (39.5%).<sup>10</sup> In other research, Ashishet al<sup>17</sup> studied 21760 pregnant mothers without COVID-19 in 2020, showing institutional death rates of 13/1000 live births increased to 21/1000 live and neonatal mortality increased to 40/1 000 live births from 13/1000 to 14/1000.

This meta-analysis found that, because of motherly complications and foetal compromise related to COVID-19, the majority of pregnant women with COVID-19 were caesarean.

## CONCLUSION

The pregnant women with COVID-19 disease had more complications and higher rate of LSCS and preterm delivery as compared to normal pregnant women. This results in lower birth weight and high rate of NICU admission and deaths.

### Author's Contribution:

Concept & Design of Study:	Nazish Ali
Drafting:	Sadia Rashid, Zaib-un-Nisa Quraishi
Data Analysis:	Aliya Waheed, Saira Ghafoor, Fehmida Saleh
Revisiting Critically:	Nazish Ali, Sadia Rashid
Final Approval of version:	Nazish Ali

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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