

Covid-19 and Birth Outcome in Infants

Avinash Ramchandra Barhate¹, Prashant Chhagan Patil²

¹Assistant Professor, Department of OBGY, Dr.Ulhas Patil Medical College and Hospital, Jalgaon

²Associate Professor, Department of OBGY, Dr.Ulhas Patil Medical College and Hospital, Jalgaon

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Corresponding author: Dr. Prashant Chhagan Patil

Conflict of interest: Nil

Abstract

Background: Severe acute respiratory syndrome coronavirus 2 (SARSCoV-2), was identified as the causative pathogen of pneumonia cases. The vulnerability of pregnant women and their offspring is well established from the results of prior coronavirus outbreaks. Past human coronavirus outbreaks have shown us that pregnant women and their unborn offspring are particularly susceptible to adverse effects. This study was conducted to look for the maternal and neonatal outcome in COVID-positive mothers.

Methods: We retrospectively analyzed their medical data. We used the Coronavirus Pneumonia Prevention's criteria as per guidelines. All of these patients had their throats sampled, and the samples were sent to the lab. Medical records were gathered and independently examined for clinical traits, lab test outcomes, and maternal and neonatal outcomes.

Results: Mean age in study group was 26.42 ± 5.26 while in control group was 27.5 ± 7.2 ($p=0.3282$). In study group complications during pregnancy was 48 (88.89%) while in control group it was 31 (28.18%) ($P<0.0001$). LSCS was performed in 50 (92.59%) and 85 (77.27%) in study group and control group respectively. Preterm delivery was observed in 8 (14.81%) in the study group while it was 5 (4.55%). Previous morbid conditions were observed in 5 (9.26%) in the study group while it was 15 (13.64%). . "Key neonatal markers, such as gestational age at birth, the APGAR score at five minutes, and intrauterine fetal distress, did not significantly differ between newborns from the cases and controls". In this study, we looked for evidence that COVID-19 pneumonia among pregnant women who underwent vaginal or caesarean birth causes significant maternal and newborn problems. The results of laboratory tests had the same profile as pregnant women without pneumonia.

Keywords: SARS COV-2, Covid-19, Pregnancy, Neonate, Delivery, Outcome.

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Introduction

Severe acute respiratory syndrome coronavirus 2 (SARSCoV-2), was identified as the causative pathogen of pneumonia cases reported to the World Health Organization

(WHO) country office in Wuhan City on December 31, 2019. The disease was subsequently detected in 20 other countries, prompting WHO to declare it a Public Health

Emergency of International Concern (PHEIC) on January 31, 2020 (PHEIC) . In light of the increasing mortality rate and in an effort to identify and protect at-risk persons in society, WHO declared this disease a PHEIC. The PHEIC has spurred a global health crisis due to the grave SARS-CoV-2 pandemic [1,2].

The vulnerability of pregnant women and their offspring is well established from the results of prior coronavirus outbreaks. Past human coronavirus outbreaks have shown us that pregnant women and their unborn offspring are particularly susceptible to adverse effects [3]. A mortality rate of up to 35% has been recorded for critical care unit admissions [4]. Pregnant women are thought to be more susceptible to the virus than the other groups [5]. It is crucial to create a plan for providing care for expectant mothers and infants during the coronavirus disease 2019 (COVID-19) crisis in order to (1) safeguard healthcare personnel from infection and to provide safe treatment for pregnant women and newborns. According to a study conducted in the United States, 13.5 percent of pregnant women had asymptomatic SARS-CoV-2 infections [6]. However, immune system alterations during pregnancy may make pregnant women more susceptible to life-threatening infections [7]. According to certain data, the risk of a severe illness may be highest during the final stages of pregnancy [8]. Amid the acute infection episode, about half of the women who gave birth did so. The majority of cases that were documented happened in the third trimester. Despite certain studies reporting instances of foetal distress, caesarean sections were used to deliver the majority of women [9]. Merely a small percentage of women had serious sickness; Most of them only had mild signs

and symptoms like coughing, fever, and dyspnea [10].

This study was conducted to look for the maternal and neonatal outcome in COVID-positive mothers.

Methods

When pregnant women were hospitalised to Dr. Ulhas Patil Medical College and Hospital Jalgaon, we retrospectively analysed their medical data. We used the Coronavirus Pneumonia Prevention's criteria as per guidelines. All of these patients had their throats sampled, and the samples were sent to the lab. "The usual chest CT imaging features as well as a positive result for SARS-CoV-2 in reverse transcription polymerase chain reaction (RT-PCR) assays, are used to diagnose COVID-19 infection".

The "laboratory-confirmed case group" consisted of 54 pregnant women who were RT PCR positive. Person who was not doing the statistical analysis randomly selected the control group from the medical records, who did not have pneumonia during their hospital stay. Only those between the ages of 25 and 35 were chosen for matching. 110 ladies who were admitted throughout the same time period were chosen. Medical records also contained information on blood test findings.

Medical records were gathered and independently examined for clinical traits, lab test outcomes, and maternal and neonatal outcomes. The group differences for categorical and continuous variables were compared using Fisher exact tests and Mann-Whitney U tests, respectively. The same patients' blood test results from different times were compared using Friedman testing.

The Medical College's ethical committee granted their consent for this investigation.

Results

Table 1: Demographic characteristics of the participants.

	Case group (n=54) %	Control group (n= 110) %	P value
Mean Age \pm SD	26.42 \pm 5.26	27.5 \pm 7.2	0.3282
Complications during pregnancy	48 (88.89%)	31 (28.18%)	< 0.0001
LSCS	50 (92.59%)	85(77.27%)	0.016
Preterm delivery	8(14.81%)	5(4.55%)	0.0227
Previous morbid conditions	5(9.26%)	15(13.64%)	0.422

SD: Standard Deviation, LSCS: Lower segment Caesarian section

Mean age in study group was 26.42 \pm 5.26 while in control group was 27.5 \pm 7.2 (p=0.3282). In study group complications during pregnancy was 48 (88.89%) while in control group it was 31 (28.18%) (P<0.0001). LSCS was performed in 50 (92.59%) and 85(77.27%) in study group and control group respectively. Preterm delivery was observed in 8(14.81%) in study group while it was 5(4.55%). Previous morbid conditions was observed in 5(9.26%) in study group while it was 15(13.64%).

Since neither patient had any respiratory problems when they were admitted for full-term labour, 6 patients underwent vaginal delivery. One of them experienced fever the first day after giving birth, and no one was getting CT scans. 48 women who were in active labour at the time of admission and tested positive for COVID underwent emergency caesarean deliveries. Exposure to the verified positive case was documented in 15 instances with a husband or a close relative.

Every patient had a chest CT scan. Of the confirmed cases, 8 (15%) had pneumonia in just one lung, whereas 12 (22%) had pneumonia in both lungs. Upon admission, C-reactive protein (CRP) and alanine aminotransferase (ALT) levels were both slightly above normal in the case group, but neither approached statistical significance..

28 individuals received antivirals while in the hospital, and all COVID-19 confirmed cases were treated with antibiotics. Their hospital

stays was from 14 to 18 days, with a mean of 15.85 days, and they were all either discharged or moved to the Covid hospitals. Due to serious maternal problems or COVID-19 pneumonia, none were hospitalized to the intensive care unit.

Neonatal Outcome

55 children were born to 54 women who had proven COVID-19 infection (53 singletons and 1 twins). Due to placental abruption and preterm membrane rupture, one singleton was born early. Preterm delivery was noted in 8 (14.81%) of the study group's pregnancies, compared to 5 (4.55%), which was statistically significant. "Key neonatal markers, such as gestational age at birth, the APGAR score at five minutes, and intrauterine foetal distress, did not significantly differ between newborns from the cases and controls".

Discussion

Maternal tolerance to hypoxia is decreased by changes in anatomy, like thoracic cage's transverse diameter increment and a higher elevation of the diaphragm. Vasodilation and changes in lung capacity can cause mucosal edema and increased mucus in the respiratory tract. Additionally, changes in cell-mediated immunity contribute to pregnant women's susceptibility to infection by viruses [11]. Dysregulation of elements like cytokines and the complement can harm the growth and operation of the central nervous system [12]. The SARS-CoV-1 outbreak

during 2002-2003 was associated with a high maternal mortality rate, miscarriages during the 1st trimester, and intrauterine growth retardation in the 2nd and 3rd trimesters [13]. The mortality rate for pregnant women was 35%, while the case fatality rate for neonates was 27% was observed by Alfaraj *et al* [14]. in a case series. But according to a recent editorial on COVID-19 in pregnancy, therapy recommendations should be based on data from the present pandemic rather than the limited experience from earlier outbreaks [15].

In terms of the delivery method, the majority of authors conducted cesarean sections, and some of them cited foetal distress as the justification for the choice [16,17]. According to Huang *et al* study, fever was the most frequent symptom [18].

None of our patients experienced significant respiratory problems that necessitated medical attention. Pregnant women had lower WBC, neutrophil, CRP, and ALT counts than nonpneumonia controls, according to laboratory tests performed upon admission. These results are in line with those from other COVID-19 hospitalised patients, many of whom exhibited lymphopenia and a low WBC count [19]. Chen *et al.* documented the clinical characteristics of 9 pregnant women with RT PCR positive COVID-19 infection cases, all of whom underwent LSCS, in earlier clinical descriptive research [20]. In comparison to our study, Chen *et al.* reported a 44 percent incidence rate of confirmed COVID-19 pneumonia patients, which was quite high. We noticed a higher incidence rate of premature birth in confirmed cases (14.81 percent), while it was only 5.4 percent in the control group [20]. Similar to the work by Wang X *et al.* [21], we did not find any evidence to support the transmission of SARS-CoV-2 from mother to foetus.

Conclusion

In this study, we looked for evidence that COVID-19 pneumonia among pregnant women who underwent vaginal or caesarean birth causes significant maternal and newborn problems. The results of laboratory tests had the same profile as pregnant women without pneumonia. Given the delay in PCR results, chest CT scans during the 3rd trimester may be a useful tool for detecting COVID-19 pneumonia.

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