

Original Article

Pregnancy outcomes of COVID-19 positive pregnant mothers at a tertiary care centre in Colombo

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Key words: COVID-19, pregnancy outcomes, neonatal outcomes, preterm delivery, lower segment caesarean section

Abstract

Background and Objective

The COVID-19 pandemic affected almost all aspects of health. It appeared to increase morbidity and mortality among pregnant women in Sri Lanka, during the 3rd wave. The aim of this study was to determine maternal and neonatal outcomes in mothers with active COVID-19 infection.

Method

A cross-sectional descriptive study was conducted over a period of 3 months during the 3rd wave of the COVID-19 pandemic on 59 mothers who were either admitted to the maternity isolation ward with active infection or were positive for COVID-19 at any point during gestation and came for delivery to the professorial unit obstetric ward. Socio demographic details, vaccination status against COVID-19 and details regarding management were collected using an interviewer administered questionnaire and analysed using the Statistical Package for the Social Sciences (SPSS – 23) software.

Results

A majority of 33, 55.9% experienced mild symptomatic disease, 25, 42.4% were asymptomatic and one developed pneumonia. Disease severity showed no statistically significant association to the trimester of contracting COVID-19, vaccination status, mode and timing of delivery or intrapartum and postpartum complications. A significant percentage (18%) delivered preterm where 77.8% of them had active disease. Low birth weight was reported in 22.7% of the newborns. Majority (71.7%) of the study sample underwent lower segment caesarean section where most (80.7%) had active disease at delivery. All newborns tested for COVID-19 status were negative.

Conclusion

An increased percentage of preterm delivery and low birth weight was observed with no statistically significant associations with trimester of contracting COVID-19 or vaccination status.

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Received: 05 Oct 2023, accepted revised version: 15 Oct 2023, Published: 30 Dec 2023

Competing Interests: Authors have declared that no competing interests exist

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Introduction

SARS-CoV-2 infection became a major threat to the lives of millions of people across the world. A report released by the United Nations stated that the major hit due to the COVID-19 pandemic was to women, children and adolescents. Initially, it was thought that pregnant women were not more affected than the general population. However, with the emergence of the Delta variant in the 3rd wave, increased adverse outcomes were observed among pregnant mothers in Sri Lanka.

Sri Lanka experienced a sharp rise in maternal deaths due to COVID-19 in 2021. To date, limited studies have been conducted regarding the prevalence of COVID-19 in pregnant mothers in Sri Lanka and its obstetric and neonatal complications.

Method

This study was conducted among pregnant mothers admitted to the maternity isolation ward at the Colombo South Teaching Hospital (CSTH) after testing positive for COVID-19 by any accepted mode of testing (PCR/ Rapid Antigen Test) and mothers who tested positive for COVID-19 during their antenatal period and were admitted to the Professorial Obstetric Unit for their confinement.

During the study period of 3 months (June – August), we systematically recruited participants (n=59) during the 3rd wave of the COVID-19 pandemic, where the prominent variant was the delta variant. Patients who denied consent to participate in the study and patients who were transferred to intermediate or tertiary care centers before the completion of their quarantine period were excluded from the study.

An interviewer administered questionnaire that gathered details pertaining to the patient's socio demography, vaccination status against COVID-19, past obstetric history, present gestation along with each trimester data, diagnosis and management of COVID-19 from the clinical records, was used following obtaining the patient's informed written consent. Pregnancy outcomes were observed prospectively and recorded. Certain data that the patient was unable to provide, such as medical status and management of the disease, were extracted from the patient's bedside notes. The Statistical Package for Social Sciences (SPSS – 23) was used to analyse data. Categorical data are presented as raw data and as frequencies. The α -level for all analysis was set as $p < 0.05$ with a 95% confidence interval.

Results

The study included a total of 59 COVID-19 positive patients diagnosed by RT-PCR 31 (52.5%) or rapid antigen test 28(47.5%).

Age distribution was >35 years 13 (22%), 30– 34years (32.2%), 20 – 24 years (33.9%) and <20years 1 (1.7%). The study sample was restricted to the Colombo and Kalutara Districts, and nearly one fourth were from the Moratuwa (11.9%) and Ratmalana (13.6%) MOH areas.

The majority 33 (55.9%) developed mild symptomatic disease without pneumonia i.e. cough, fever, arthralgia and myalgia, while 15, 25.6% complained of difficulty in breathing, 25 (42.4%) were asymptomatic and only 1 (1.7%) developed COVID-19 related pneumonia.

The only teenage mother in the group presented with mild disease. The >35 years mothers had almost an equal distribution of asymptomatic and symptomatic cases with mild disease. There was no association between age and severity of COVID-19 infection ($p>0.05$).

Pharmaceutical agents were used in 23 (38%) patients, which included antibiotics 16 (69.6%), inhalers 4 (17.4%), anticoagulants 4 (17.4%) and dexamethasone 1 (4.3%).

The time of contracting COVID 19 infection was 42 (71.2%) 3rd, 14 (23.7%) 2nd and 3 (5.1%) in first trimester. The only patient who had pneumonia was in the 3rd trimester. There was no association between the trimester of contracting the disease and severity of COVID-19 infection.

Out of 59 patients, 6 (10.2%) had been vaccinated against COVID-19 but only 2 (3.4%) had 2 doses of the vaccine. Majority (5) had Sinopharm vaccine while 1 had AstraZeneca. Among the 6 vaccinated patients, 4 were asymptomatic and 2 had mild disease whilst among the non-vaccinated patients, 1(1.8%) developed pneumonia, 31 (57.6%) had mild symptoms and 21 (39.6%) were asymptomatic. There was no association between vaccination status of patient and severity of the COVID-19 infection.

Pre-existing maternal comorbidities were seen in 12, bronchial asthma 3, anaemia 3, diabetes mellitus 2, hypertension 1, diabetes and hypertension 1, epilepsy 1 hypothyroidism 1. There was no association between positive past medical history and the severity of the disease ($p>0.05$).

Gestational diabetes mellitus was detected in 14 mothers of whom 11(78.6%) had symptomatic disease whereas only 50% of the mothers without gestational diabetes mellitus were symptomatic ($p>0.05$).

The majority of the 59 study subjects, 42 (71.7%) underwent lower segment caesarean section (LSCS); 18 (30.4%), emergency and 24 (41.3%) elective LSCS. Of the 42 mothers who were positive for COVID-19 in the 3rd trimester, 31 (73.9%) had LSCS whereas of the 14 mothers who were infected in the 2nd trimester 7 (50%) had caesarean section. LSCS were performed due to foetal 16 (33.3%) and maternal 7 (15.2%) causes while 13 (27.3%) underwent LSCS due to COVID-19 infection with no other indication for LSCS. ($p>0.05$). Of the mothers who were delivered by LSCS while having active disease, 32.3% were emergency and 48.4% were elective. In contrast, only 53.7% of mothers who delivered without any active disease have undergone LSCS and the rest (46.7%) have had vaginal delivery. ($p>0.05$).

There were 9 (18%) pre-term deliveries of which one underwent emergency LSCS due to placental abruption at 34+6 weeks of gestation. Of the 8 who developed spontaneous pre-term labour 4 underwent vaginal delivery, 4 had emergency LSCS. Among those who had preterm delivery, 77.8% had active disease and 88.9% contracted the disease during the 3rd trimester. However, there was no statistically significant association between preterm labour and the active disease status of the disease. ($p>0.05$)

Amongst the 46 pregnant mothers who delivered their babies during our study period, 10 (21.7%) developed intrapartum complications: prolonged labour, meconium-stained liquor and CTG abnormalities. There was one intrapartum intrauterine death. Highest proportion (90%) of those who developed intrapartum complications were those who contracted COVID-19 infection during their 3rd trimester. Among those infected with COVID-19 in the 2nd trimester, the only intrapartum complication seen was prolonged labour in one mother. There was no statistically significant association between trimester of contraction of the disease and intrapartum complications ($p>0.05$).

Of the 21 asymptomatic patients most, 17 (80.95%) had no intrapartum complications while 4 (19.04%) had at least one intrapartum complication, whereas out of 24 mothers with mild disease and 1 with evidence of pneumonia, 6 (24%) had at least one intrapartum complication.

The teenage mother didn't develop any intrapartum complications, however of the 11 elderly mothers 1 had an intrapartum intrauterine death and 1 had meconium-stained liquor.

None of the patients with bronchial asthma, diabetes mellitus and/or hypertension developed intrapartum complications. However, of the 2 patients with anaemia in pregnancy, 1 had meconium-stained liquor during delivery.

Most of the mothers had no postpartum complications. Out of the 3 patients who had postpartum complications, 2 were diagnosed patients with gestational diabetes mellitus.

None of the mothers infected during the 2nd trimester developed any postpartum complications, whereas 7% of mothers with active disease in their 3rd trimester developed postpartum complications.

Of the 20 asymptomatic patients, 8(40.0%) had at least one postpartum complication, whereas of the 23 patients with mild disease, 1(4.3%) had evidence of COVID-19 pneumonia, 8(33.3%) had at least one postpartum complication showing no significant association between the disease severity and postpartum complications.

Of the 59 pregnant mothers, 28(47.5%) had at least one pregnancy related complication. There was one each with confirmed placenta praevia, oligohydramnios and premature rupture of membranes. Three mothers had foetal growth restriction and two with active COVID-19 disease had intrauterine death of which one was a twin pregnancy making up to three stillbirths. Of the 59 mothers, only 46 delivered their babies during our study

period and details pertaining to 3rd trimester, intrapartum and postpartum with neonatal complications were not included in 16 patients. Of the 46 mothers who delivered during our study period, two had stillbirths and there was one neonatal death on day 2. Of the 44 newborns, 34(77.3%) weighed >2.5kg and 10(22.7%) less than or equal to 2.5kg. Of the 10 mothers of low-birth-weight neonates 70% had active disease during the delivery and 80% contracted the infection during the 3rd trimester ($p>0.5$).

Of the 44 live-births only 3.4% had 5th minute APGAR score of <9 and 4.4% had been resuscitated at birth by the paediatric team. Six newborns developed neonatal jaundice, of which 5 were delivered while mother had active COVID-19 infection ($p>0.05$). Four newborns had been treated for presumed sepsis. Only 1 neonate developed respiratory complications. Nineteen neonates underwent special interventions soon after birth, phototherapy 6, intravenous antibiotics 4, admission to Neonatal Baby Unit (NBU) 3, Special Care Baby Unit (SCBU) 2. All the babies born to mothers with active disease were tested for COVID-19 on quarantine day 07 via a PCR test and all were negative for the disease. Newborns were nourished with breast milk 38(88.6%), formula milk 2(4.5%) and 2(4.5%) IV fluids following birth.

Discussion

Despite many studies that have been conducted worldwide to understand maternal and neonatal outcomes among pregnant women who tested positive for COVID-19 during their gestation period, the lack of data in Sri Lanka prompted us to conduct this study. The major limiting factor for this study is the sample size even though the maximum possible number of patients were recruited during a period of 3 months. Hence this can be considered as a pilot study in Sri Lanka with regards to maternal and neonatal outcomes in mothers who are positive for COVID-19 during the period of gestation. Patients who presented late with complicated disease were directly admitted to the high-dependency unit and medical intensive care unit, bypassing our study setting, and were not included in this study sample. Hence our study to analyse the association between the severity of disease and maternal and neonatal outcomes is limited.

Clinical Spectrum of disease among pregnant mothers

In a study conducted in the USA, which included 43 pregnant women positive for COVID-19 infection, the clinical spectrum of the disease varied from mild to critical. Of the 43 patients studied, 37 (86%) were reported to have experienced mild symptoms while 4 (9.3%) had severe symptoms and a small portion (4.7%) had been reported to be critical [1]. Similarly, in our study 42.4% were asymptomatic while 55.9% had mild symptoms, 1.7% had pneumonia.

According to a case control study on maternal and neonatal outcomes of pregnant women with COVID 19 infection, severe maternal and neonatal complications were not observed in pregnant women with COVID-19 pneumonia who had vaginal or caesarean delivery [2].

In a retrospective study in Hubei Province, China [3], the delivery method of both COVID positive and COVID negative groups was caesarean section, at gestational age (38.7 ± 1.4) and (37.9 ± 1.6) weeks, with no significant difference between the two groups. In our study, the LSCS rate was higher (71.7%) in mothers with active disease during their delivery owing to the necessity of intervention in mothers with COVID-19 in contrast to those mothers without the active disease.

Neonatal Outcomes

The possibility of vertical transmission of SARS-CoV-2 was shown to be negligible in an observational study which enrolled pregnant women with COVID-19 in North India in 2020 to evaluate neonatal outcomes and the risk of vertical transmission [4]. Among neonates born to 41 COVID-19 positive mothers, 13 (29.5%) had low birth weight; 7 (15.9%) were preterm; and 6 (13.6%) required NICU admission which reflects an increased incidence of caesarean delivery and low birth weight but zero neonatal mortality [4].

In a retrospective study in Hubei province, China, there was no significant association between the incidence of foetal distress, meconium-stained amniotic fluid, preterm birth and neonatal asphyxia and COVID 19 positivity in mothers [5], which is similar to our findings.

SARS CoV-2 infection has not been found in neonates delivered by the pregnant women with COVID-19 [5], which is similar to our findings

An observational study conducted among non-COVID-19 positive patients at De Soysa Maternity Hospital, in Sri Lanka, showed a preterm birth rate of 9.4% [6]. However, our study showed a higher risk (18%) of pre-term deliveries with maternal COVID-19 infection. In a systematic review, including 51 pregnant patients with COVID-19, 39% delivered before 37 weeks of gestation [1].

According to the global nutrition report, 15.2% neonates have low birth weight in Sri Lanka [7], whereas our study shows 22.7% of the neonates with maternal COVID-19 infection had low birth weight.

Conclusions

Majority of the pregnant women who presented to CSTH, with active or treated COVID-19 infection during their pregnancy were in their early 20s with most (71.2%) contracting the disease in the 3rd trimester. Most (55.9%) had mild symptomatic disease with predominance of cough, fever and myalgia.

Age, pre-pregnancy medical complications, antenatal complications such as gestational diabetes mellitus, anaemia in pregnancy did not show any statistically significant association with the severity of the disease, even though most (78.57%) of the patients with gestational diabetes mellitus had symptomatic disease.

A single case of placental abruption and 2 cases of intrauterine foetal deaths were reported during the study period. A small proportion of the sample developed intrapartum complications and post-partum complications.

A high proportion (71.7%) of the study sample underwent LSCS and 80.7% had active disease at the time of delivery. While foetal causes were the predominant indication, maternal positivity for COVID-19 has also been considered as an indication for LSCS in a considerable number of patients.

All neonates who were investigated for COVID-19 status were negative. Six neonates were diagnosed with neonatal jaundice while 4 were treated with antibiotics for presumed sepsis. There was one neonatal death on day 2 of delivery. There was an increased percentage of preterm delivery (18%) and low birth weight (22.7%) when compared to the Sri Lankan newborns in the normal population but without statistically significant associations.

Acknowledgements

This study was supported by the Professorial Obstetric Unit and Maternity Isolation Ward in Colombo South Teaching Hospital, Kalubowila, Sri Lanka and the Faculty of Medical Sciences, University of Sri Jayewardenepura.

Compliance with Ethical Standards

Ethics Approval: Ethical Approval was received from the Ethics Review Committee of Colombo South Teaching Hospital. Informed written consent was taken from the participants of the study.

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