

OBSTETRIC OUTCOMES DURING COVID-19 PANDEMIC: A COMPARISON WITH PRE-COVID PERIOD FROM A TERTIARY CARE CENTRE IN A RURAL SET UP IN SOUTH INDIA

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Abstract

Background: To assess the obstetric outcomes before and during the COVID-19 pandemic and to find out the influence of the pandemic on them. **Materials and Methods:** A retrospective observational study was performed, details were gathered in regard to the number of maternity admissions, referrals, deliveries, maternal deaths, and other obstetric outcomes from the pre-COVID period of January 2018 to December 2019 and from January 2020 to December 2021 (covid pandemic period) and the same were analysed and compared. **Result:** It was observed that a 26.4% increase in the number of deliveries occurred during the pandemic period when compared to the period before the pandemic in the institution. There was a 11% increase in the referral-in from primary and secondary level care. An appreciable rise in the maternal and new-born deaths were noted in the pandemic era. 131 covid positive women were delivered at the centre with favourable maternal and foetal outcomes. **Conclusion:** Maternal health management during any pandemic is extremely important. Emergency care to the pregnant mothers are indispensable services to be pursued in the pandemics while maintaining covid appropriate behaviours like social distancing and personal hygiene.

INTRODUCTION

The COVID-19 pandemic has grossly affected the lives of people since its onset in December 2019 across the world.^[1] The pandemic is continuing to have its effect on many health outcomes of which the most important is maternal mortality. The remarkable progress seen in maternal and child health in India over the past two decades has been impacted by the pandemic.^[2]

Although COVID-19 disease itself does not cause increased maternal mortality compared to the general population directly, unsupervised pregnancies and the absence of routine antenatal visits may have indirect adverse effects on maternal health.^[3] This pandemic witnessed a crucial change in the health care system by means of major redistribution of health care framework and health personnel, to cater the general population diseased with the virus, and the knowledge about how this change has affected the pregnancy care especially in a rural set-up is not well known.

Hence, the utilization of routine health services significantly reduces during every outbreak.^[4] The regular vital services in the health care facilities, both in government and private, stand neglected as the

personnel, endeavours and first-aid materials are all focused to combat the outbreak. People with health problems unrelated to the epidemic find it harder to get access to health care services.^[5]

Early registration, regular visits, periodical monitoring by blood tests and scan, early picking up of warning signs to identify high risk pregnancies are part and parcel of a good antenatal care. Lockdowns, home quarantines, social control acted as barriers for providing such regular antenatal care. As a result, co-morbid conditions in the antenatal mothers were left undetected, that led to fatal consequences. Even in an emergency condition, the pregnant mothers were unable to reach the care providers on time during this pandemic.

Even in the days before the pandemic, in a rural set-up like ours, prompt obstetric healthcare provisions were unreachable for many mothers. In a tribal population, the proportion of institutional deliveries are low even today and home deliveries are still prevalent.

Travel constraints and limited availability of health centres during the pandemic period have further worsened the undesirable effect on mother's health. The aftermath of isolation and lockdown on maternal well-being in a rural background still remains little

explored. The main objective of this study was to evaluate the indirect consequences of the COVID-19 pandemic on the well-being of pregnant women and foeto-maternal outcomes.

MATERIALS AND METHODS

This study was conducted in the Department of Obstetrics and Gynaecology at Government Tiruvannamalai medical college, Tiruvannamalai, for a tenure of four years from January 2018 to December 2021. Government Tiruvannamalai medical college is the only 24*7 functioning tertiary care CEmONC centre in the rural district with an average of 11000 to 12000 deliveries per year. As it is the only referral centre from primary and secondary level health care and as the population comprises of predominantly rural and tribal people, the study centre deals with a greater number of complicated obstetrics cases. The study was a retrospective observational study which comprised all the patients admitted into our labour ward during the period of this study. Data collected from January 2018 to December 2019 were considered as from pre-covid period and those from January 2020 to December 2021 as from the covid pandemic era. Approval by the Institutional Ethical Committee was obtained. Total number of maternity admissions, referrals, antenatal OPD census, delivery statistics, high-risk pregnancies, intrauterine deaths, maternal and neonatal deaths were assessed. These data were compared and analysed. During the pandemic, the institute continued to provide regular obstetric services and was functioning as an approved covid care centre in the district. Round the clock emergency services were provided and all cases referred to our hospital were treated as per the covid protocol and regional guidelines enforced by the Government.

RESULTS

Overall, 31,719 pregnant women were admitted in the Department of Obstetrics over a span of 24 months from January 2020 to December 2021 during the COVID-19 pandemic. Prior to COVID-19, there were 29,518 admissions in the department. Thus, a rise in admissions of only about 7.5% was observed during the pandemic. [Table 1]

Throughout the pandemic, it was discovered that there has been a 8 percentage rise in the number of high-risk pregnancies. The hospital received 96% high-risk cases during the pandemic whereas in the pre-pandemic era it was 88%.

Mothers attending our antenatal OPD for regular antenatal visits were 2423 less in the pandemic period.

The referrals from primary and secondary level care were high in the period of the pandemic (43%) compared to (32%) the period prior to the pandemic. When compared with times before COVID, a 26.4% increase in the number of deliveries was observed in the study centre. The total number of deliveries in the times before COVID-19 was 18,392 during a period of 2 years (January 2018 to December 2019), while in COVID-19 times, it was 23,255 (January 2020 to December 2021). Of these 23,255 deliveries during COVID-19 times, 13,555 (58.3%) were vaginal deliveries and 9700 (41.7%) were caesarean deliveries [Figure 1].

There were 29 maternal mortalities in these 2 years of pandemic while there were only 14 maternal deaths between January 2018 and December 2019.

Maternal death analysis showed in the pre -covid era, gestational hypertension (28.5%), haemorrhage (21.5%) and sepsis (21.5%) were the leading causes of the deaths whereas in the covid era apart from gestational hypertension (24%) and haemorrhage (17.2%), viral pneumonia related deaths also contributed to 17.2% (n=5) of the maternal deaths [Figure 2].

Of the 5 cases, 3 cases had CT findings suggestive of covid and were started on remdesivir, heparin and steroids. Remaining 2 cases had suspicious features. All 5 were RT PCR negative. Out of 29 deaths in the covid period, there were 17 late referrals.

There were no much differences in the intrauterine deaths but the number of neonatal deaths were high during the pandemic era and prematurity was the major contributor.

Associated obstetrical comorbidities like gestational hypertension, gestational diabetes, severe anaemia, and obesity were seen more commonly in the death cases in covid era than in the pre covid era. Of these, incidence of gestational diabetes was found to be 2-fold increased and gestational hypertension was found to be 42% higher in the covid pandemic. Incidence of preterm labour was found to be alarmingly high (by 44%) during the pandemic period (1513 vs 846) [Table 2].

526 pregnant women who were tested positive for COVID-19 were treated in the centre; of these,131 delivered with a good foeto-maternal outcomes [Table 3]. 97 (74%) patients delivered vaginally and the remaining 34 (26%) needed caesarean section for various obstetric indications [Figure 3]. All the infants delivered were negative for COVID-19.

Table 1: Comparison of statistics between the pre COVID-19 and COVID-19 periods in the Department of Obstetrics

| | Pre COVID | COVID |
|----------------------------------|-----------|-------|
| Total maternity admissions | 29518 | 31719 |
| Complicated maternity admissions | 25959 | 30458 |
| AN OPD census | 18564 | 16141 |
| Referral in | 9522 | 13561 |
| Total deliveries | 18392 | 23255 |
| Total caesarean deliveries | 7632 | 9700 |

| | | |
|--------------------------|-------|-------|
| Total vaginal deliveries | 10760 | 13555 |
| IUD | 291 | 285 |
| Neonatal deaths | 270 | 383 |
| Maternal deaths | 14 | 29 |

Table 2: Obstetrical complications during pre-covid and covid period. (Number of cases)

| | pre COVID | COVID |
|--------------------------|-----------|-------|
| Gestational hypertension | 1477 | 2094 |
| Gestational diabetes | 236 | 487 |
| Anaemia | 2564 | 3083 |
| Preterm labour | 846 | 1513 |

Table 3: COVID positive deliveries

| | First wave | Second wave |
|----------------------------|------------|-------------|
| Total number of Admissions | 276 | 250 |
| Total number of Deliveries | 83 | 48 |
| Normal Delivery | 55 | 42 |
| Caesarean Delivery | 28 | 6 |

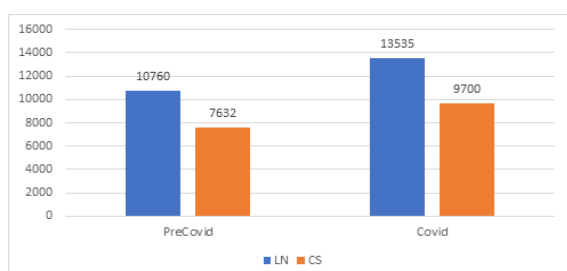


Figure 1: Comparison of deliveries – Pre-COVID vs COVID

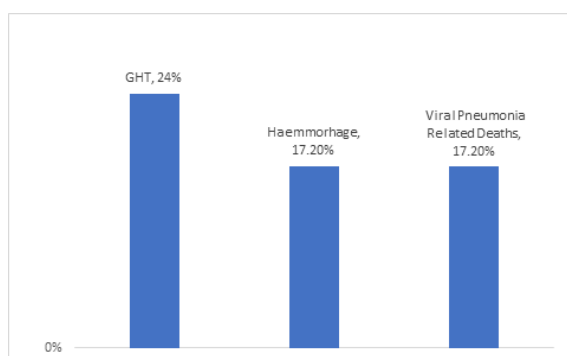


Figure 2: Leading causes of Maternal mortality in COVID era

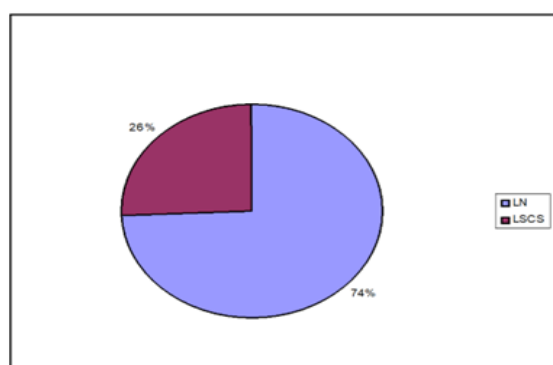


Figure 3: Mode of Delivery in COVID positive mothers

DISCUSSION

Besides the direct consequences of the pandemic, the indirect consequences of the disease have proven to

be disastrous. The inference of this study shows that COVID-19 has proven indirect adverse outcomes on pregnancy.

Early reports suggested an increase in iatrogenic preterm birth and caesarean birth in infected mothers,^[6] and there is evidence of an increased risk of maternal intensive care unit (ICU) admission and maternal mortality due to COVID-19 in some settings.^[7] Furthermore, multiple reports have raised concerns about the indirect effects of the pandemic on pregnant women and babies, over and above the direct effects of viral infection.^[8]

The following factors could be attributed to the adverse obstetric outcomes:

1. Lockdown:

The execution of lockdown by our government to retard the transmission of the dreadful virus could have fortuitously intervened with the emergency antenatal care for the mothers through the non-availability of public vehicles, because in a rural set-up like ours most pregnant women still depend on public transports for hospital visits, be it elective or emergency. Reduction in the availability of public transport retards accessibility to tertiary care centre especially for referral cases from remote areas, thereby leading on to very late admission of women requiring real emergency obstetric intervention. Also, antenatal and postnatal care services were affected due to the availability of a smaller number of health care providers in the hospitals.

2. Anxiety and fear

Pregnant women avoided seeking admission to hospitals due to an unprecedented anxiety in view of the fast spread of the virus, stay indoors and social distancing instructions from the media and fear of acquiring the infection from the health facilities.

3. Hospital stay

There was a decrease in the average duration of hospital stay after both normal and caesarean deliveries during the pandemic. This along with lack of postnatal home visits ended in an increase in postpartum complications and its related morbidity and mortality.

4. Private hospitals

Non-availability of emergency obstetric management in private and other non-governmental health-care facilities in view of shortage of paramedics is another reason.

5. Financial constraints

Reduced income and limited financial resources in the family is yet another cause for pregnant women not seeking the health care facilities in early phase of complications.

These disruptions to routine and the required maternity care leads to adverse maternal and foetal outcomes. Looking at the history, epidemics have shown that they are extremely threatening to the surviving healthcare systems. Studies conducted during the West African Ebola outbreak of 2014 have shown that the indirect effects of the pandemic on maternal health were severe, resulting in decreased utilization of antepartum, intrapartum, and postpartum care.^[9]

A prospective observational study at a tertiary hospital in India by Goyal et al reported a reduction in institutional deliveries, increase in pregnancies with complications, increase in intensive care unit admissions between the months of April - August 2020 and only a third of women had adequate antenatal care visits during this period.^[10] In the study by Davis et al,^[11] it was found that, due to the fear of contagion from the institutes, women are preferring home deliveries instead of institutional deliveries. Unless an emergency supervenes, patients avoided visiting health-care facilities. Fakari et al,^[12] observed that COVID-19 has increased the stress and anxiety of pregnant women, which can indirectly cause an increase in the number of patients with pre-eclampsia, nausea and vomiting, preterm labor, and depression. All studies showed increased rates of maternal mortality.

Medical disorders complicating pregnancies like hypertension and diabetes were diagnosed late as health-seeking was delayed. Periodical Hb estimation, blood pressure recording, blood sugar estimation was lacking during the lockdown period. Iron and folic acid supplementation were not taken routinely during pregnancy, which resulted in increased number of anaemia complicating pregnancies. Pregnant mothers also showed resistance for undergoing routine antenatal visits and the required examinations; making early diagnosis and necessary treatment of the clinical conditions impossible. Hence maternal morbidities and mortalities were high during the pandemic.

Given these findings, there is a dire necessity for awareness programmes to alleviate patients' anxiety and to make them understand that it is comparatively safe for them to visit a hospital for seeking obstetric care during an emergency, which if not treated, has a relatively high morbidity and mortality compared with covid-19 infection per se.

CONCLUSION

COVID-19 pandemic, though does not exert its influence directly on the net result of pregnancy, has significant indirect deleterious consequences on maternal and newborn health. Like the pandemics faced in the past, the functioning system of healthcare encounters a considerable threat during the pandemic of COVID-19 too. There is an urgent necessity to teach patients and their relatives concerning the significance of structured antenatal visits and to practice covid appropriate behaviours. An integrated well-organized healthcare system is the need of the moment to reduce morbidity and mortality related to COVID-19.

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