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RESEARCH ARTICLE

THE MATERNAL AND PERINATAL OUTCOMES OF PREGNANCIES COMPLICATED WITH COVID-19: A RETROSPECTIVE, OBSERVATIONAL STUDY IN A TERTIARY CARE CENTER

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ABSTRACT

Introduction: The COVID-19 pandemic leading to National lockdowns, disruption of health care services and fear of attending health facilities has affected the well-being of the pregnant women and their babies. A very few studies done on pregnancies complicated with COVID-19 suggest that the pregnant women may present with severe manifestations leading to feto-maternal compromise. **Methodology:** We did a retrospective descriptive study in GMC, Kathua after attaining approval from Institutional Ethical Committee. All the pregnant women , with laboratory confirmed positive result of either RTPCR or RAT report from nasopharyngeal or oropharyngeal swab (8) from 1st of March to 31st of May 2021 were included in the study. Data was analyzed as mean, percentages and range.**Results:** Among the 23 observed women, the mean age was 27. 3 patients were asymptomatic, fever was the most common symptom among symptomatic (55%). X-Ray and D-dimer was done only in 2 patients with clinically moderate and severe covid 19 cases. Nearly 56% of the patients had mild transaminitis. Only 1 patient had severe illness and stayed in ICU for 8 days. Average hospital stay of women was 6 days. Preterm deliveries happened in 1 woman. 1 IUD was reported and 17% of neonates were admitted in NICU. **Conclusion:** All suspected pregnant women should be systematically screened, monitored and followed up. Pregnant women may present with mild disease. Neuraxial anesthesia is the better choice of anesthesia in Caesarean sections whenever possible. Perinatal morbidity may increase due to underlying maternal infection. Further investigations and follow-up studies of pregnant mothers infected by COVID-19 are warranted.

INTRODUCTION

COVID-19 was first documented in Wuhan, China as the cluster of pneumonia like illness, at the end of 2019 (1). By 30th of January 2020, the corona virus disease was declared as Public Health Emergency of International Concern (PHEIC). The first case in India was also confirmed on 30thof January (2). On Feb 11, the WHO announced name for disease as COVID-19. SARS-COV_2 is a member of coronavirus family. These are enveloped RNA viruses that are widely distributed in humans, mammals and birds. The other pathogens from this family have also inflicted wide range of viral infections including Middle East Respiratory Syndrome (MERS-COV) and Severe Acute Respiratory Syndrome (SARS-C0V). The main route of transmission is through respiratory droplets and direct contact. While the spectrum of disease severity ranges from mild to critical, most cases are mild.

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However, to this date, SARS-C0V_2 mortality rate is greater than MERS and SARS combined and has a global case fatality rate of about 6.4% (1). The COVID-19 pandemic has had profound effects on health care systems, societal structures and world's economy. National lockdowns, disruption of health care services and fear of attending health facilities has affected the well-being of the pregnant women and their babies (3). Also, it is known that pregnant women have reduced immunity, thus they are at increased risk of acquiring COVID-19 infection during the pandemic (4). Preliminary evidence from the diseases caused by the coronaviruses have suggested that pregnant women are more likely to have severe manifestations of the disease, morbidity and mortality as compared to non-pregnant women with increased risk of critical illness (5). This is because the body's immune system and response to viral infections might be changed due to pregnancy, which explains increased severity of symptoms. A very few studies done on pregnancies complicated with COVID-19 suggest that the pregnant women may present with severe manifestations like hypoxia, hypotension, electrolyte disturbances, placental hypoperfusion, fetal distress, preterm labor, miscarriage or fetal death (6).

But according to the guidelines from Royal College of Obstetricians and Gynecologists (RCOG), pregnant women do not appear more likely to contract the COVID-19 infection than general population and the spectrum of the disease mostly remains mild (7). So, it is still doubtful whether the clinical characteristics of pregnant women with COVID-19 infection differ from those of normal population, whether pregnancy and labor aggravate COVID-19 symptoms and whether antiviral therapy is essential for COVID -19 affected pregnant women. The purpose of our study was to describe the clinical characteristics of the pregnancies affected with COVID-19 and fetal and maternal outcomes. This study shall provide some evidence for guiding the management of pregnant women with COVID-19 infection.

METHODOLOGY

Study design and Participants: We did a retrospective descriptive study in Govt. Medical College, Kathua after attaining approval from Institutional Ethical Committee. Ours is a new Medical College transformed from District Hospital in December 2018. It is the only dedicated tertiary Hospital in the district which has been catering large population from a big catchment area. All the pregnant women coming to the Hospital, with laboratory confirmed positive result of either quantitative Real Time Polymerase Chain Reaction (RTPCR) or Rapid Antigen Test (RAT) report from nasopharyngeal or oropharyngeal swab (8) from 1st of March to 31st of May 2021 were included in the study. Test was done according to ICMR guidelines which stated that pregnant women residing in Hot spot district presenting in labour or likely to deliver in next 5 days should be tested even if she is asymptomatic. The swabs were collected after wearing a complete PPE (Personnel Protective Equipment) and were transferred in VTM (Viral Transport Medium) to Microbiology department for testing.

- **Variables:** Data was extracted from the medical records of the patients and included variables like age, weight, obstetric details, comorbidities, disease severity, investigations, radiological findings, treatment, obstetric complications like, Preterm labor, PROM, IUD, Oligohydramnios and information on neonates like birth weight, APGAR, need for oxygen therapy and NICU admissions etc.All the collected data was analysed using Microsoft excel SPSS version 26. The qualitative data was reported as proportions and quantitative data were reported as mean ±sd and percentages.

RESULTS

The mean age of study population (23) was around 27 with a range of 20-32 years. 44% women were primi and another 44% were Para 2. 11% women had pre existing medical illnesses (Table I). In 61% patients, RTPCR was performed remaining 39% were confirmed with RAT positive reports. Out of 23 patients, 20 patients were symptomatic while 3 patients were asymptomatic. Fever was the most prevalent symptom,55% (Table 1). No patient had leukopenia or lymphopenia in our study (Table I). 39% had a CRP levels of >8. AST>40 U/L was in 9 patients and ALT > 40U/L was in 13 out of 23 patients. Raised LDH was in 56% of the patients (Table II). Average hospital stay was 5 days. Antibiotics were prescribed to 14 (60.87%) patients, LMWH was given 7 patients and steroids were given to 2 patients. 2 patients required ICU admission (Table III). 20 women were delivered term, 1 continued pregnancy, 1 had IUD and 1 had preterm delivery. 12 (54.55%) patients had vaginal delivery, 10 (45.45%) patients underwent LSCS (Table IV). Spinal Anaesthesia was given to all the patients. 4 neonates required NICU admissions, out which 3 required oxygen therapy. No neonate was tested for SARS-COV2 (Table IV).

DISCUSSION

Pregnant women are considered a high risk group because of concerns about the effect of covid-19 on them during and after pregnancy, and on their neonates (9,10,11). With increasing number of cases and new mutant strains of the virus a thorough insight is needed to study the impact of the disease in pregnant women and newborns, and the potential of mother-to-child transmission. Although publications on covid-19 in pregnancy have risen steeply through individual case reports, case series, observational studies, and systematic reviews small sample sized studies have also been reported (12,13,14). Ours is a small sample size study of 23 antenatal women affected with Covid 19. Though testing for Covid 19 in general population is based on symptoms or contact history, testing during pregnancy is usually done when they are in hospital for reasons not directly related to covid-19. A trend of mild symptoms was noticed in our study which is similar to the reports by other authors (15,16).The high rate of asymptomatic presentation in pregnant women with COVID-19 may be explained by the screening strategy for COVID-19 and the low thresholds for testing during pregnancy (17). Even detecting more pregnant women with mild disease, higher admissions to the ICU or invasive ventilation have been observed when compared with non-pregnant women of reproductive age with COVID-19. Increased maternal age, high body mass index, non-white ethnicity, and preexisting comorbidities are associated with severe disease. Preexisting medical disorders might have an increased risk on the overall disease progression and high incidence of maternal mortality has been reported in mothers having underlying comorbities (18). In our study lesser than one quarter of women reported underlying medical problems. One patient with underlying chronic hypertension controlled on antihypertensive medication. Fever, cough and dyspnea may be the most common presentation in many studies frequent symptoms (19).Fever was the most common presentation in our study population. Most of the patients reported of mild disease only and maintained vitals during observation. Raised C-reactive protein level, lymphopenia, raised white cell count and raised procalcitonin level may be the most frequent laboratory findings (20,21,23,24). Our population of women showed mild transaminitis, whereas D-dimer levels were done only in 2 patientsfound to be above the normal range , but D- dimers are increased in last trimester of pregnancy otherwise also. Ground glass appearance is the most common radiological presentation reported in literature (22). For our study group only 8 % women had underwent X ray changes and radiological pneumonia was seen during evaluation in both the patients.An average hospital stay of 5 days was observed in our study whereas a non-pregnant Covid positive patient with mild disease requires an average hospitalisation of 2-3 days. This could be attributed to extra care given to pregnant women owing to the vulnerable state of pregnancy and the apprehension of family members who were not ready to get discharged even if home isolation could be allowed. This claim is also supported by a study which reported that COVID-19 associated pregnant women were more than 12 times as likely to be hospitalized (25). Not many

studies reported outcomes by trimester for symptom onset, making it difficult to assess the rates of miscarriage and postpartum complications. However, majority of studies report women presenting in the third trimester. Zaigham and Andersson reported that 21% pregnancies presented at earlier gestations, and they were all discharged without any serious complications(26) and amongst the 7 cases of spontaneous vaginal delivery were not associated with poorer outcomes In our study, the admitted patients were mostly nearing term. Majority of women had a term delivery and only one had preterm delivery. The onset of labor was spontaneous with no documented intra or post natal complication or instrumental delivery. Some reports favor the use of instrumental delivery over a caesarean section to avoid unnecessary surgical complications and maternal exhaustion.Favre *et al* suggested that for every individual patient, vaginal delivery even by induction should be considered (27).Many studies report caesarean section was performed in the majority of cases and several authors cited fetal distress as the reason behind the decision (28,29).Intrapartum transmission was the main concern for choosing cesarean section. Since there is limited evidence about vertical transmission and vaginal shedding of virus, vaginal delivery in stable patients may be considered. In our study, the incidence of cesarean delivery was lower compared to vaginal delivery and cesarean section was done because of obstetric emergencies, except one elective cesarean in women with previous cesarean section and postdated pregnancy. Covid 19 was not an independent factor influencing the mode of delivery.All women underwent cesarean section under spinal anesthesia in our study. None patient had to be converted to general anesthesia (30). One patient had a brief episode of hypoxia Spo2(<94%) during third stage intraoperatively, was managed with oxygen with ventimask @ 5 litres / min. She had no symptoms of hypoxia. 1 of our patients landed up in severe covid illness , she was 37 weeks of gestation. She was shifted to ICU as she required O2 of 10 to 15 litres with HFM with NRV . She remained in ICU for 8 days with X rays findings of pneumonia. She was managed with Antibiotics, LMWH and steroids. Later she delivered normally in 39 weeks and baby was fine. Another patient who shifted to ICU, was 36 weeks pregnant showed features of moderate illness and required O2 with ventimask 4-10 l/m for 3 days. She stayed in ICU for 6 days and later delivered vaginally. Baby was fine.

Regarding the perinatal outcomes, most authors did not report any adverse events (31,32,33,34) In our study, the pooled proportion of perinatal mortality is about 4%, while the most common adverse perinatal outcome is fetal distress, with less than 20% of the newborns admitted in the neonatal intensive care unit (NICU). Zhu *et al*, reported one neonatal death and a total of 6 admissions to the NICU (11). This study concluded that perinatal 2019-nCoV infection may have adverse effects on newborns, causing problems such as fetal distress, premature labor, respiratory distress, thrombocytopenia accompanied by abnormal liver function, and even death. Fetal demise in women with confirmed COVID-19 without any other significant clinical or obstetric disorders suggest that fetal death can be an outcome of SARS-CoV-2 infection in pregnancy. Placental infarcts and inflammation raise the possibility of a direct effect of SARS-co V-2 on the placenta. A study of placentas of 16 women with severe COVID-19 infection (15 live births in the third trimester and 1 delivered in the second trimester after intrauterine foetal demise) found that pregnant women who were infected with COVID-19 and delivered in the third trimester were more likely to have placentas that show features of maternal vascular mal perfusion and intervillous thrombi (35). These findings suggest abnormal maternal circulation that is associated with adverse perinatal outcomes. These changes may reflect a systemic inflammatory or hypercoagulable state influencing placental physiology. The authors suggest an increased antenatal surveillance for women with COVID-19 may be warranted[35]. However, the placentas of the still born neonates were however not sent or histopathological examination in our patients. No baby was tested for covid 19 infection. However, these findings should be interpreted with caution in view of the very small number of included cases and heterogeneity in clinical presentation and perinatal management among the included cases.

Conclusion

All suspected pregnant women should be systematically screened, monitored and followed up. Pregnant women may present with mild diseases. Neuraxial anesthesia is the better choice of anesthesia in Caesarean sections whenever possible. The possibility of vertical transmission of vaginal delivery is unknown and if suspected the possible mechanisms need to be clarified. Perinatal morbidity may increase due to underlying maternal infection. Further investigations and follow-up studies of pregnant mothers infected by COVID-19 are warranted.

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