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ORIGINAL ARTICLE

Frequency of Covid-19 in Pregnant Women and its Effects on Fetal and Maternal Outcome

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ABSTRACT

Objective: To determine the frequency of COVID-19 in pregnant women and its effects on feto-maternal outcomes at a tertiary care hospital.

Methods: Present cross-sectional study was conducted at the department of gynae and OBS, at Ziauddin University and Hospital Karachi, from April, 2020 to August 2020. All the pregnant women at term who were admitted for delivery in maternity unit, aged more than 18 years old, and of either parity, were included. After taking written and verbal informed consent women were offered to be tested for SARS-COV2 via Nasopharyngeal PCR swab test. Those women who tested positive for the COVID-19 test were treated according to the severity of the symptoms, and asymptomatic and clinically sound patients were shifted to isolation rooms. Women who presented in spontaneous labour were treated as SARS COV2 positive for safety purposes. SPSS version 22 was used to perform the analysis, all of the data.

Results: A total of 454 pregnant females were tested for SARS-CoV2 via a nasopharyngeal PCR swab test, and 12 (3%) women tested positive. Out of the 12 women testing positive, 4 were preterm births, and no significant association was found between COVID PCR being positive (p=0.00) and preterm birth (p=0.112). Five out of 12 women testing positive had an episode(s) of leaking. There was a strong association between COVID PCR being positive and episodes of leaking (p=0.001). Three out of 12 women testing positive had fetal distress, while 19 out of 454 women testing negative had fetal distress (p=0.004). There were no cases of APH or PPH reported in women testing positive; however, out of 442 women testing negative, 1 APH and 3 PPH were reported. There was no mortality in either of the patients, mother or neonate.

Conclusion: As per the study conclusion, the frequency of COVID-19 among women during pregnancy was observed to be only 3%, which was significantly linked to the pneumonia, leaking, and fetal distress.

Keywords: Covid-19, pregnancy, complications, mortality

INTRODUCTION

The novel corona virus disease (COVID-19) causes a certain type of pneumonia that is highly infectious in nature, and the WHO has declared the current pandemic a critical threat to public health all around the world. When December 2019 came to an end, the first case of COVID-19 was discovered in China's Wuhan city, in Hubei province. [2] Such a virus was identified as "severe acute respiratory tract corona virus-2" by the World Health Organization' on 11th February 2020.[3] The prime target of corona virus is the human's respiratory system.[2] There have been previous outbreaks of corona viruses that comprise the Severe Acute Respiratory Syndrome (SARS-CoV) and the Middle East Respiratory Syndrome (MERS-CoV), and therefore COVID-19 is considered to be the third outbreak that has impacted over 209 nations, Pakistan being one of them. COVID-19 clinical manifestations of COVID-19 are similar to those of other corona viruses, with symptoms including cough, fever, diarrhoea, headache, and myalgia. [4] The world has been changed in an unprecedented manner because of SARS-CoV-2, the novel strain of corona virus that causes COVID-19. The rapid universal spreading of SARS-CoV-2 may stipulate that the reproduction number of the virus, which is currently an accepted approximate, may be an underestimate because there are many asymptomatic carriers of the virus, and even though they are contagious, they are not detected by the public health surveillance systems.[5] Pakistan shares its borders with China and Iran, which are the two major hubs of corona virus, and there is substantial traffic between these countries.[3] On February 26, 2020, the Ministry of Health, in Pakistan, confirmed the country's first instance of COVID-19 infection, and in the following days, all the confirmed cases that had been identified had the history of travel from London, Syria, and Iran.[2] The COVID-19 outbreak has caused the government of Pakistan to take different steps in combating the virus. These steps include the designation of healthcare facilities, institutions for quarantine and testing, and other facilities, treatment of patients, public awareness of COVID-19; and the response of the local community towards this outbreak.[2] Pregnancy may suppose considered a duration of immunosuppression, and there are several physiological alterations; therefore, females are more likely to develop respiratory infections and the viral pneumonia. [6] Previous studies regarding SARS in pregnancy suggest that it is associated with a high risk of spontaneous miscarriage. [7] The SARS-CoV infection's mortality rate is 10%, of which mortality in pregnant women is 25%. [8] However, the recent Ebola epidemic and SARS pandemic showed that pregnant women had a worse outcome than non-pregnant women, owing to the fact that there are certain adaptive alterations that occur physiologically during gestation, such as an increased demand for oxygen and decreased functional residual capacity.[8] And therefore, during pregnancy, women infected with SARS and MERS experienced severe respiratory failure. [4] There are limited studies available regarding COVID-19 and pregnancy, and their results specify that there had been no reason to believe that women during pregnancy are more prone to getting infected with a corona virus.[4] In the course of this pandemic, the obstetrical population portrays a distinctive challenge as the patients have multiple experiences with the system of health care over the course of their treatment, and in due course, the majority of these patients are admitted for delivery to the hospitals. Pregnancy, being an immunosuppressive state, causes the immune system to weaken and makes women susceptible to the complication of infection.[8] There is insubstantial information available with reference to the vertical transmission of COVID-19 and the assessment and management of pregnant women infected with COVID-19.[9] The universal testing approach of COVID-19 has quite a few benefits, including the fact that it will determine the isolation practices of the health facilities, the availability of the beds, information regarding neonatal care, and the usage of the equipment for personal protection.[10] During these tough times, data regarding the above components will give us the chance to protect mothers, babies, and the healthcare teams.[10] This study has been done to evaluate the frequency of COVID-19 in pregnant women and its effects on feto-maternal outcomes at a tertiary care hospital.

MATERIAL AND METHODS

This cross-sectional study was conducted at the department of gynae and OBS, at Ziauddin University and Hospital Karachi. The study was conducted over a period of five months, from April 2020 to August 2020. All the pregnant women at term who were admitted for delivery in a maternity unit, aged more than 18 years old, and of either parity, were included. All the known COVID-19-infected women and those who did not agree to participate in the study were excluded. After the clinical examination, routine laboratory investigations were done. Written and verbal informed consent was obtained from each woman after explaining the study's objective and purpose. All the women were counselled that their information would remain confidential. After taking informed consent, all the women were offered to be tested for SARS-CoV2 via a nasopharyngeal PCR swab test. A proforma was drafted to record the age, symptoms of COVID-19 (not in asymptomatic patients), gestational age of the fetus at the time of delivery, and symptoms of SARS-CoV2 at the time of admission. Those women who tested positive for the RT-PCR test were treated according to the severity of the symptoms, and asymptomatic and clinically sound patients were shifted to isolation rooms. Women who presented in spontaneous labour were treated as SARS COV2 positive for safety purposes. SPSS version 22 was used to perform the analysis, all of the data. The mean and standard deviation were used to represent the numerical variables, while the frequency and percentage were used to describe the categorical variables. A chi-square test was applied for the level of significance by taking a p-value <0.05.

RESULTS

A total of 454 pregnant females were tested for SARS-CoV2 via nasopharyngeal PCR swab test. Out of these 12 (3%) women tested positive and 442 (97%) tested negative for COVID-19 making it a ratio of 1:37. Out of the 12 women testing positive, 4 were preterm births and the rest 8 were full term births. Out of 442 tests that were negative, 71 were preterm, and the remaining 371 were full term. There was found to be no significant association between COVID PCR being positive (p=0.00) and preterm birth (p=0.112). Five out of 12 women who tested positive had an episode of leaking.37 out of 454 women testing positive had an episode(s) of leaking. There was a strong association between COVID PCR being positive (p=0.00) and episode(s) of leaking (p=0.00). Three out of 12 women testing positive had fetal distress. 19 out of 454 women testing negative had fetal distress. A strong association was found between COVID PCR being positive (p=0.00) and fetal distress (p=0.04).

The mode of delivery for 11 of the 12 women testing positive for COVID was LSCS, whereas 1 of them gave birth via SVD. The mode of delivery for 314 of the 454 women testing negative was LSCS, whereas 127 gave birth via SVD and 1 woman gave birth via VBAC. There was a strong association between COVID PCR being positive (p=0.00) and LSCS being the commonest mode of delivery (p=0.294). There were no cases of APH or PPH reported in women testing positive; however, out of 442 women testing negative, 1 APH and 3 PPH were reported. There was no mortality in either of the patients, mother or neonate.

Table 1: Mean age and frequency of Covid-19 PCR Positive n=454

Variables	Statistics
Mean age	32.12+3.23 years
Covid-19 PCR Positive	12(3.0%)
Covid-19 PCR Negative	442(97.0%)

Table 2: Fetal and maternal outcomes according to Covid-19 PCR Positive n=454

PCR	Pneumonia	Preterm	ICU Admission	Leaking	Fetal Distress	Maternal Mortality	APH/PPH
Covid-19 PCR- Positive	1/12	4/12	0/12	5/12	3/12	0/12	0/12
Covid-19 PCR Negative	0/442	71/442	0/442	37/442	22/442	0/442	3/442
p-value	0.001**	0.112	--	0.001**	0.004**	--	0.947

DISCUSSION

During March 2020 to November 2020, a total of 12 out of 454 women admitted to Ziauddin Hospital in Clifton, tested positive for COVID-19. The average age of those 12 females who tested positive for COVID-19 was 28.8 +1 year, and the mean gestational age was 37 + 2 weeks. Out of these 12 women only 2 (16%) complained of cough and mild shortness of breath, while the rest 84% females were asymptomatic. There was no maternal or fetal mortality reported during the intrapartum or postpartum periods. According to a study conducted in Nepal, the reported maternal mortality rate was also zero.[11] However, the UK reported a case of a 29-year-old female of Pakistani origin who died of a thrombotic event in the postpartum period.[12] As both pregnancy and COVID are risk factors for thrombosis, this case highlighted the synergy of COVID with pregnancy, increasing complications that were associated with thrombotic events. Apart from this, there are numerous reasons that can cause maternal mortality, though COVID is a big factor that should be considered, and appropriate measures should be taken in order to avoid such situations. In addition to this, Brazil also reported 20 maternal deaths,[13] where the women were between 20 and 43 years old, and had risk factors that included hypertension and asthma. In conclusion; the availability of health care facilities, containment measures for COVID, the high prevalence of related risk factors, and the variant of COVID present in a given geographical location impacts impact maternal mortality as a whole. The prevalence of COVID-19 amongst women who were at term and presented to Ziauddin Hospital in Clifton came out to be 2.64%. Out of these 454 women, 12 (3%) tested positive and 442 (97%) tested negative for COVID-19, making a ratio of 1:37. The number of positive cases exerts pressure on the medical system, as separate ICU and isolation wards are required for the confirmed positive patients. Operation theatres are limited, so this puts a burden on the entire health care system, as according to the standard operating guidelines, the operation theatre has to be clean, and decontamination of all surfaces with hypochlorite solution along with high-energy UV lamp sterilization for two hours is done. Hence, elective and emergency procedures also suffer, especially in settings where operation theatres are limited.

In this study, 3 out of 12 women testing positive had fetal distress, and 19 out of 454 women testing negative had fetal distress. A strong association was found between the COVID PCR result (p=0.00) and fetal distress (p=0.04). Fetal distress is a common complication of labor. The most common signs of fetal distress are abnormal changes in the heart rate of the baby, decreased fetal movements, and meconium in the amniotic fluid. The common causes of fetal distress are usually abnormal presentation of the fetus, placental abruption, preeclampsia, prolonged and arrested labor, umbilical cord compression, prolapse, and other problems associated with the umbilical cord. In our study, 25% of the women testing positive experienced fetal distress, whereas only 4% of the women testing negative experienced fetal distress. Fetal distress could be due to the impact of COVID-19, and our results are in line with that. [14,15,16]

However, we are yet to understand the direct relationship between COVID-19 and fetal distress.[14] There was a strong association between the COVID PCR result (p=0.00) and LSCS being the commonest mode of delivery (p=0.294). In our study, caesarean sections were done on patients who were COVID-positive with additional maternal and fetal risk factors. According to Bharti Maheshwari et al[17] 84% of the COVID-19-positive females had to be delivered via LSCS, furthermore, according to a study in

New York, 68.9% of women delivered via caesarean section, where COVID-19 was the only common indication.[18] In many studies, the only indication for caesarean section was COVID-19 due to concerns about vertical transmission and the preference to give the mother antiviral therapy. However, we have to keep in mind that a C-section is not the only method of choice. According to the guidelines, if there is no contraindication to vaginal delivery and the symptoms of COVID-19 are mild or moderate, a vaginal delivery can be performed under strict monitoring. Keeping this in mind, there are strategies set by the World Health Organization (WHO) that aim to protect mothers from unnecessary medical technologies to promote maternal health.[19]

In this study four of the 12 women who tested positive had preterm births, while the remaining eight had full-term births. Out of 442 testing negatives, 71 were preterm, and the remaining 371 were full term as well as, we found no significant association between the COVID PCR result (p = 0.00) and preterm birth (p=0.112). A survey of other published research showed a variety of results. As per the study conducted in Brazil, Liu et al[6] reported the clinical course and outcomes of the women during COVID-19, demonstrating a substantial incidence of complications Because of the numerous underlying conditions, the majority of the patients needed to have their babies delivered via emergency caesarean section, and the majority of the babies were born prematurely.[20] Although Chen et al[1] reported that all of the cases underwent caesarean sections, but no premature births or deaths of new-born babies. Gonçalves, et al[20] reflecting there to be seemingly no connection between preterm births and COVID positivity. In a study published in China, it was reported that 18.8% of pregnant women were with the diagnosis of COVID-19 pneumonia and 16.7% of pregnant women with suspected COVID-19 pneumonia had preterm births as a result of maternal complications during pregnancy, which were seen to be highly frequent in contrast to the controls.[21] Furthermore, two of the three patients diagnosed with premature birth had a prematurely ruptured membrane, while one was induced by bleeding of the placenta. Two of the cases were brought on by gestational hypertension and preeclampsia, while one was possibly caused by placenta previa.[21] Another study indicated that the women during pregnancy who have covid-19 have a significantly higher chance of premature birth and having NICU admissions for their babies, however the rate of spontaneously premature births is not high overal.[22] In another study in China, four of the nine cases had premature labour. Moreover, there was no relationship found between COVID-19 pneumonia and the reasons for premature delivery, with other causes such as pre-eclampsia, a history of stillbirths, or a history of multiple caesarean sections, to name a few. All of this seems to indicate that even though some COVID-positive patients, did go into preterm labour, it was mostly due to other maternal complications, and there does not seem to be much relation between this infection and preterm deliveries.[1]

In this study, 5 out of 12 women testing positive had an episode(s) of leaking, and 37 out of 454 women testing positive had an episode(s) of leaking. As per our results, there was a strong association between the COVID PCR result (p=0.00) and the episode(s) of leaking (p=0.00). On the other hand, Hantoushzadeh S et al[23] reported that during the reporting time, 7 of the 9 women during pregnancy died who were diagnosed with severe COVID-19 illness, 1 of the 9 remains extremely ill and is reliant on a ventilator, while remaining 1 of the 9 has survived normally after being hospitalized for an extended period of time. Although, as mentioned in a study from Agha Khan University in Karachi, some believe that mothers who develop SARS-CoV-2 during pregnancy are more predisposed to complications. These include, but are not limited to, rupture of membranes, premature birth, respiratory distress, fetal distress, coagulopathy accompanied by hepatic dysfunction, and sometimes even the death of the mother.[8] In a research conducted in China it was seen that after the beginning of the COVID-19 infection, a number of gestational complications manifested themselves, including early rupture of the membranes and fetal distress among 2 of the 9 cases.[1] Premature rupture of membranes was observed to be one of the causes of a patient delivering prematurely.[1] Among 12 COVID-positive patients, no case of antepartum or postpartum haemorrhage was seen, while in 438 COVID-negative patients, one patient had antepartum haemorrhage and three patients went into postpartum hemorrhages. There is no difference in adverse pregnancy outcomes in terms of obstetric haemorrhage between SARS-Cov-2 positive and SARS-Cov-2 negative women admitted for delivery during pregnancy. However, Munir SI et al[4] observed that the prevalence of COVID-19 in pregnant women is not significantly different from that seen in the general population. In most cases, the outcome for the fetus and the mother is favourable, and there is no indication of vertical transmission in any of the new-borns. Although others were seen to have developed slight complications, as COVID-19 during pregnancy was associated with adverse fetal and maternal outcomes.[24,25]

CONCLUSION

As per the study conclusion the frequency of Covid-19 among women during pregnancy was observed to be the only 3%, which was significantly linked to the pneumonia, leaking and fetal distress.

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