Original Research Article

Birthing in Covid-A Study in a tertiary care Hospital, GGH, Kadapa

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Abstract

Background: COVID 19, caused by SARS-COV-2 is a global health emergency. Corona viruses are enveloped, RNA viruses and is spread by respiratory droplets. Pregnancy is a physiological state that predisposes to viral infections and making them more susceptible to COVID-19 than the general population.**Aims and Objectives:** 1) To evaluate the effects of COVID-19 infection on maternal morbidity and maortaloty,course of labour and perinatal outcome. 2) To study the effective implementation of COVID management protocol in antenatal mothers attending labour room, counseling and isolation. **Materials and Methods:** A Retrospective Observational Analytical study is done in the Department of OBG from 1st April to 30th October,2010 at a Tertiary care hospital, GGH, Kadapa. A total of 197 pregnant women who were COVID positive were included in the study.**Results:** Among 197 COVID positive antenatal women, 137 cases delivered. Out of 137 deliveries, 75 (54.7%) patients were delivered by LSCS and 62 (45.2%) patients delivered vaginally. Most common indication for LSCS is Prior LSCS (40%) followed by CPD (16%) and fetal distress(6%). One Maternal Death was reported due to Severe Preeclampsia with pulmonary edema in COVID positive mother. Out of the remaining 60 patients, 21 were admitted with symptoms(fever, cold and cough) and given symptomatic treatment , 39 were in quarantine for 14days and discharged. Out of 137 deliveries, only 5 babies had APGAR <6 and needed SNCU admission and 2 babies required ventilatory support. All the babies were tested for COVID, only one baby was tested Positive and remaining all the babies were healthy.**Discussion:** All the symptomatic antenatal mothers should be admitted and treated as COVID positive unless otherwise tested negative by RT-PCR. Deliveries should be conducted by wearing PPE kits , Donning and Doffing should be done with precautions. Breastfeeding should be encouraged to all the babies.**Conclusion:** There is no significant effect of COVID 19 infection on maternal outcome in pregnancy and most of the complications were due to associated comorbidities like preeclampsia. The perinatal transmission of COVID19 infection is very minimal. Timely isolation, Isolation, Counselling, Breastfeeding methods and following strict COVID management protocol at our hospital resulted in better maternal and perinatal outcome.

Keywords: Covid-19, RT-PCR, RNA Virus, Perinatal Transmission.

Introduction

The novel coronavirus infection (COVID-19) is a global public health emergency. The first case of coronavirus infection was identified in Wuhan, Hubei province of China and was notified to the WHO on 31st December 2019. By 30th of January 2020, the coronavirus disease was declared as a Public Health Emergency of International Concern (PHEIC)[1] In addition to China, cases have spread to 25 other countries including15 cases in the United States. Initial outbreak data from China show a near exponential growth of reported cases[2-5]Reported numbers are likely underestimates of the true numbers because milder cases are less likely to be reported. On Jan. 30, 2020, the World Health Organization declared the outbreak as a public health emergency of international concern; on Jan. 31, 2020, the United States declared a public health emergency, and the Centers for Disease Control and Prevention issued a federal quarantine for 195 Americans who traveled from Wuhan, China, its first federal quarantine in more than 50 years.

It did not take long for the COVID-19 to establish its roots in India as the first case was confirmed on 30th January . As of 16th May 2020, the total number of cases in India was 85,940 with 2753 deaths reported by the Ministry of Health and Family Welfare .The mode of transmission is by droplets which can occur when the patient sneezes or coughs. The incubation period varies from 2 days to 2 weeks following exposure to the virus. An analysis of 181 confirmed COVID-19 cases outside Wuhan, China, found the mean incubation period to be 5.1 days and that 97.5% of the individuals who developed symptoms did so within 11.5 days of infection . The period from the onset of COVID-19 symptoms to death ranged from 6 to 41 days with a median of 14 days with a case fatality rate of 2.3%[5,6] The patient can present with an array of symptoms, most commonly presenting with complaints of cold, cough, fever, malaise, headache, itch- ing or watering in the eyes. However, patients may also present with gradual worsening of respiratory discomfort or multiorgan failure. The diagnosis of current infection relies on tests to detect the presence of virus in various body fluids. The standard test being done presently is detection of the viral RNA by RT-PCR (Reverse Transcriptase Polymerase Chain Reaction) from the nasopharyngeal mucosa as recommended by the ICMR (Indian Council of Medical Research). Antibody tests on blood are used to confirm past infection and presumed immunity to repeat infection, although effectiveness of such tests is not yet known .Corona viruses are enveloped, nonsegmented,RNA viruses belonging to the family Coronaviridae, Order Niroviridae. SARS-COV-2 is spread by respiratory droplets and direct contact. It is viable on plastic and stainless steel surfaces for upto 72 hrs, copper and cardboard for upto

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24 hrs. In the past 2 decades, 2 other coronaviruses that cause severe respiratory illness in humans have emerged: severe acute respiratory syndrome coronavirus (SARS-CoV) and the Middle East respiratory syndrome coronavirus (MERS- CoV). With the emergence of SARS-CoV-2, a third coronavirus that can cause severe respiratory illness has been identified. In a short period of time, this novel coronavirus has caused more cases of illness than were reported for MERS and SARS combined.Pregnancy is a physiological state that predisposes women to viral respiratory infections due to the rise in progesterone levels which invigorate the brains respiratory centre and creating a functional state of hyperventilation making them more susceptible to COVID-19 then the general population.Coronavirus disease has thrown the entire medical fraternity into a world of uncertainty and clinical dilemma in the absence of preexisting guidelines or protocols. In the back- drop of this pandemic, it thus becomes imperative to study the effects of the infection on pregnancy. This study is to assess the effects of COVID-19 infection on the maternal morbidity and mortality as well as the effects on newborn in the 197 pregnant women diagnosed with COVID infection in the pandemic.

Severe acute respiratory syndrome (SARS) is caused by the SARS-CoV. Re- ports of the emergence of SARS-CoV appeared in February 2003, with the first cases observed in Guangdong Province in China. The virus spread to nearly 30 countries throughout the world, resulting in more than 8000 cases and 770 deaths. The outbreak was brought under control after public health control measures to reduce contact with infected persons were put into place, and no cases have been seen since 2004. Manifestations of SARS consist of fever, chills, headache, malaise, and myalgia. Diarrhea was seen in some patients. Pneumonia was nearly always seen in patients diagnosed with SARS, with mechanical ventilation being required in 10-20% of cases. Case fatality rate was estimated at 9-10%.

The largest case series of pregnant women with SARS was from the 2003 outbreak in Hong Kong, in which 12 pregnant women were identified.The case-fatality rate was 25% (3 deaths). Clinical and laboratory findings were similar to those seen in the nonpregnant population.

Middle East Respiratory Syndrome (MERS) is a respiratory illness caused by MERS-CoV. The illness was first identi- fied in Saudi Arabia in 2012, with spread to other countries in the Arabian peninsula and eventually to countries outside the Arabian peninsula, including the United States. The largest outbreak outside the Arabian Peninsula was in the Republic of Korea in 2015.Nearly 2500 cases of MERS-CoV illness and more than 860 deaths have been reported with continuing reports into the present. The manifestations of MERS include severe respiratory illness characterized by fever, cough, and shortness of breath. Some patients also have diarrhea. The case fatality rate is estimated to be 35-40%.Patients who developed MERS were more likely to be older (median age is 50 years) with about two thirds of patients being male. Patients with MERS were also more likely to have an underlying illness. Some patients with MERS-CoV infection have been asymp- tomatic (identified through contact investigations). The mean incubation period is 5.2 days, with a range of 2e13 days. As with SARS, MERS is mainly spread person to person through close contact, with transmission in health care settings, and superspreading events have been observed. However, since 2016, the number of cases of MERS-CoV has been dramatically reduced after public health efforts to prevent MERS-CoVtrans- mission were put into place. Information on MERS among preg- nant women is limited. We identified reports of 13 cases of pregnant women with MERS from several countries, including Saudi Arabia (n 8), Korea (n 2), Jordan (n 1), United Arab Emirates (n 1), and Philippines (n 1). Two women were asymptomatic, identified as part of a contact investigation. Among the 11 symptomatic women, manifestations were similar to those seen in nonpregnant patients with MERS.Seven of 13 patients were admitted to an intensive care unit for respiratory deterioration or acute respiratory distress syndrome, 5 required ventilator support, 3 died, and 8 recovered. Among the 3 deaths, the mothers died 8e25 days after delivery. Both babies born to asymptomatic women were born healthy at term; among those who were symptomatic, there was 1 intrauterine fetal demise, 1 stillbirth, 1 baby delivered at 25 weeks who died 4 hours after birth, 2 healthy preterm infants, and 5 healthy term infants (infant status was not mentioned for 1).

Coronavirus disease 2019 (COVID-19)

Early data suggested an association between the Huanan Seafood Wholesale Market and COVID-19 with 27 of 41 cases in 1 report and 26 of 47 in another report with epidemiologic links to the market, leading to closure of the market on Jan. 1, 2020. Given that the earliest case reported (illness onset on Dec. 1, 2019)did not have exposure to the market raises the possibility that the initial emergence into humans occurred elsewhere. However, sampling of the market's environment supports the market's importance in early trans- mission of the virus. Later cases were much less likely to have visited the market, supporting the role of person- to-person transmission in later cases.The SARS-CoV-2 is a betacoronavirus similar to SARS-CoV and MERS-CoV . Sequencing data show that the SARS-CoV-2 is most closely related to coronaviruses found in bats, with more than 85% nucleotide identity with a bat SARS-like CoV. The virus has 79% nucleotide identity to SARS-CoV and about 50% to MERS-CoV. Bats appear to be the natural reservoirs of both SARS-CoV and MERS-CoV. The emergence of these viruses in humans has been attributed to host switching: the virus jumped from an intermediary host species (eg, civet cats for SARS-CoV and dromedary camels for MERS-CoV) to humans. An intermediary host species is thought to be likely for SARS-CoV-2, although it has been yet to be identified. Sequence data show a high degree (>99.98%) of similarity of the virus among different patients, suggesting a recent emergence in humans.

Person-to-person transmission of SARS-CoV-2 is thought to be similar to transmission of influenza and other respiratory pathogens; respiratory droplets are formed when an infected person coughs or sneezes and these droplets are inhaled by close contacts, generally within 6 feet. Susceptibility to and severity of COVID-19 in pregnancy. Although data are limited, there is no evidence from other severe coronavirus infections (SARS or MERS) that pregnant women are more susceptible to infection with coronavirus. Thus far, in this outbreak of novel coronavirus infection, more men have been affected than women. This observed gender difference could be due to differences in reporting, susceptibility, exposure, or recognition and diagnosis of infection. There are no data to inform whether pregnancy increases susceptibility to COVID-19. Previous data on SARS and MERS suggest that clinical findings during pregnancy can range from no symptoms to severe disease and death. The most common symptoms of COVID-19 are fever and cough, with more than 80% of hospitalized patients presenting with these symptoms.

In a recent study by Chen et al[7], 9 women diagnosed with COVID-19 during the third trimester of pregnancy were reported. In this small series, clin- ical presentation was similar to that seen in nonpregnant adults, with fever in 7, cough in 4, myalgia in 3, and sore throat and malaise each in 2 women. Five had lymphopenia. All had pneumonia, but none required mechanical ventilation, and none died. All women had a cesarean delivery, and Apgar scores were 8-9 at 1 minute and 9-10 at 5 minutes.In a second series of 9 pregnancies with 10 infants (1 set of twins) reported by Zhu et al., symptom onset was before delivery (1e6 days) in 4, on the day of delivery in 2, and after delivery (1e3 days) in 3 cases. Clinical presen- tation of COVID-19 was similar to that seen in nonpregnant patients. Among the 9 pregnancies, intrauterine fetal distress was noted in 6, 7 were cesarean deliveries, and 6 infants were born pre- term. Based on these limited reports and the available data from other respiratory pathogens such as SARS and influenza, it is unknown whether pregnant women with COVID-19 will experience more severe disease.

Principles for management of pregnant women with confirmed or suspected COVID-19

- Patients with respiratory symptoms should adhere to respiratory hygiene, cough etiquette, and hand hygiene. Ensure rapid triage of pregnant patients with respiratory symptoms. Patients with respiratory symptoms should wear a facemask and wait in a separate, well- ventilated waiting area at least 6 feet from other people.
- Confirmed and suspected cases of COVID-19 should be isolated as soon as possible in an AIIR. If an AIIR is not available, consider transfer to a hospital with an AIIR.
- Implement CDC infection prevention and control procedures for health care providers including standard, contact, and airborne precautions. Eye protection and properly fitted N95 respirators should be used. Provide additional staff training in correct use of personal protective equipment including correct donning, doffing, and disposal of personal protective equipment.
- Contact hospital infection personnel.
- In coordination with local/state health department, collect and send relevant specimens for diagnostic SARS-CoV-2 testing.
- Limit visitor and health care personnel access to patient rooms with a confirmed or suspected case.
- Pregnancy should be considered a potentially increased risk condition and monitored closely including fetal heart rate and contraction monitoring.
- Consider early oxygen therapy (target O_2 saturations $\leq$ 95% and/or pO_2 70 mm Hg). Consider early mechanical ventilation with evidence of advancing respiratory failure. Noninvasive ventilation techniques may have a small increased risk of aspiration in pregnancy.
- Use intravenous fluids conservatively unless cardiovascular instability is present.
- Screen for other viral respiratory infections and bacterial infections (because of risk of coinfections).
- Consider empiric antimicrobial therapy (because of risk for superimposed bacterial infections).
- Consider empiric treatment for influenza, pending diagnostic testing.
- Do not routinely use corticosteroids. Use of steroids to promote fetal maturity with anticipated preterm delivery can be considered on individual basis.
- If septic shock is suspected, institute prompt, targeted management.
- Delivery and pregnancy termination decisions should be based on gestational age, maternal condition, and fetal stability, and maternal wishes.
- Consult with specialists in obstetrics, maternal-fetal medicine, neonatology, intensive care, anesthesia, and nursing.
- Communicate with patients and families regarding diagnosis, clinical status, and management wishes.

AIIR, airborne infection isolation room; CDC, Centers for Disease Control and Prevention; COVID-19, coronavirus disease 2019; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Aims and Objectives

1. To evaluate the effects of COVID 19 infection on maternal morbidity and mortality, course of labour and Perinatal outcome.
2. To study the Effective implementation of COVID management protocol in antenatal mothers attending labour room, counseling,isolation.

Materials and Methods

A retrospective observational analytical study is done in Department of Obstetrics and Gynaecology from 1st April to 20th October 2020 at a tertiary hospital , GGH , kadapa.

A total of 197 pregnant women who were COVID positive were included in the study.

Results

Table 1:Age distribution

Sl. No	Age Group	No. of Patients
1	18-22	63
2	22-26	102
3	27-31	32
		197

Among 197 COVID positive antenatal women 102 patients belonged to age group 22-26 years

. **Table 2:Parity Distribution**

Sl. No	Parity	No. of Patients
1	PRIMI	71
2	Multi	126
		197

Out of 197 antenatal women 71 are primi and 126 are multipara in our study.

Table 3:Trimester Distribution

Sl. No	Trimester	No. of Patients
1	First	32
2	Second	28
3	Third	137
		197

Out of 197 COVID 19 positive antenatal patients 32 belong to first trimester , 28 were second trimester and maximum 137 belonged to third trimester.

Table 4:Mode of Delivery

Sl. No	Mode of Delivery	No. of Patients
1	NVD	62
2	LSCS	75
		137

Among 197 COVID 19 positive antenatal patients 137 cases delivered. Out of 137 deliveries, 75 (54.7%) patients were delivered by LSCS and 62 (45%) were delivered vaginally.

Table 5:Indication of Lscs

Sl No	Indication	No. of Patients
1	Prior LSCS	40%
2	CPD	16%
3	Fetal Distress	6%
4	Other	38%

Most common indication for LSCS is prior LSCS 40% followed by CPD 16% and fetal distress (6%).

Table 6:SNCU Admission

Required	Not Required	Total
5	132	137
3.7%	96.3%	100

Out of 137 deliveries only 5 (3.7%) required NICU admission

Table 7:APGAR Score

APGAR Less Than 6	APGAR More Than 6	Total
5	132	137
3.7%	96.3%	100%

Out of 137 deliveries only 5(3.7%) had APGAR less than 6 and they all admitted in SNCU and only 2 among them required mechanical ventilation One maternal death was reported due to Severe preeclampsia and pulmonary edema.All the babies were tested for COVID, only one baby tested positive and remaining all the babies were healthy.

Discussion

All the symptomatic antenatal mothers should be admitted and treated as COVID positive unless and otherwise tested negative by RT-PCR.Deliveries should be conducted by wearing PPE kits, Donning and Doffing should be done with precautions. Breast feeding should be encouraged to all the babies.Similar to nonpregnant patients, the predominant features of COVID-19 in pregnancy are fever, cough, dyspnea and lymphopenia. Shortness of breath is described in up to 18% of patients with COVID-19. In some cases, this may be difficult to discern from physiologic dyspnea due to increased maternal oxygen demands from heightened metabolism, gestational anemia and fetal oxygen consumption, which are common in pregnancy. Initial reports from seven pregnant women with COVID-19 in China displayed clinical manifestations of fever (86%), cough (14%), shortness of breath (14%) and diarrhea (14%). A more detailed review of 118 pregnant women in Wuhan with confirmed COVID-19 subsequently presented by Chen *et al*[7]observed similar results, that the most common symptoms in 112 women with available data were fever (75%), cough (73%) and lymphopenia (44%).These figures have been similar in other studies. There are also reports of atypical clinical presentations in COVID-19 pregnant patients, including a normal temperature (56%) and leucocytosis and other symptoms, including nasal congestion, rash, sputum production, headache, malaise and loss of appetite in less than 5% of cases. presenting symptoms can vary, and women present with a spectrum of clinical manifestations that range from mild symptoms and signs to severe illness, including pneumonia with or without acute respiratory distress syndrome (ARDS), renal failure and multi-organ dysfunction may require immediate advanced critical care support.As a result, those affected are typically described as having mild, severe or critical disease. Early reports suggest that the percentages in the pregnant population are similar to those described for nonpregnant adults with COVID-19 infections (approximately 80% mild, 15% severe and 5% critical disease).A New York study applying similar COVID-19 disease severity characteristics as described by Chen et al.,[7]observed that 37 (86%) of women possessed mild disease, 4 (9.3%) exhibited severe disease and 2 (4.7%) developed a critical disease, US study also described the development of viral myocarditis and cardiomyopathy in 33% of critically ill nonpregnant cases. To date, there is one paper, which describes two cases of cardiomyopathy in pregnant women. This report suggests performing an echocardiogram in pregnant women with COVID-19 pneumonia, in particular those necessitating oxygen or those who are critically ill. More data is needed to determine the incidence of cardiomyopathy in pregnancy and in the postnatal period secondary to COVID-19, and as with many elements of this new disease, we will see the true number evolve overtime.

The LSCS rate for women with confirmed COVID-19 infection has been reported as ranging from 42.9% to as high as 91–92% in other studies. In our study 75 (54.7%) LSCS were reported. The systematic review by Di Mascio, with a CS rate greater than 90%, primarily included women who were hospitalized with Covid-19 pneumonia in over 90% of cases, and these high CS rates do not seem to be representative of women who have mild to moderate disease. It would appear that many of the CS procedures were performed in maternal interest, due to concern for maternal respiratory function. In our study LSCS rate was found to be 54.7% .Furthermore, data emerging from an Italian study of 42 women reported a CS rate of 42.9%, of which 8 had CS procedures for an indication unrelated to the COVID-19 infection. This study also reported a vaginal delivery rate of 57.1%.Early reports indicate no increased rates of miscarriage or early pregnancy loss in relation to COVID-19 infection. Recently a second trimester (19 weeks) miscarriage was reported,describing COVID-19 infection on the maternal side of the placenta suggesting acute placental insufficiency resulting in subsequent miscarriage. In our study no miscarriages were reported. The case was supported by virological findings in the placenta, and placental histology demonstrated inflammatory infiltrates and evidence of funitis. There was no evidence of vertical transmission. Another case describes severe oligohydramnios in the context of COVID-19 infection,although further data are required to investigate this potential association. Similarly, the rates of intrauterine growth restriction and other possible effects of the virus are yet to be determined with little or no data available on the above statistics at present to make any sound clinical conclusions. To date, there are two stillbirths reported secondary to severe maternal infection and one neonatal death secondary to complications of prematurity.Initial studies suggest a much lower maternal mortality rate for those with confirmed COVID-19 in comparison to those infected with MERS and SARS, respectively. In our study 2(1.45%) deaths were reported and both due to preeclmpsia , pulmonary edema. A systematic view of 41 pregnancies affected by COVID-19 observed maternal mortality of 0% in comparison to a rate of 28.6% with MERS and 25.8% with SARS, while the second report of 108 pregnancies also reported no maternal deaths. Subsequently, a case report has been published describing maternal mortality secondary to severe disease, with both maternal and neonatal demise and an Iranian case series reported maternal deaths in seven of nine pregnant women with critical COVID-19. The true maternal mortality rate is yet to be determined, particularly in the higher risk pregnant population,An early study by Chen *et al*.[7]tested for SARS-CoV-2 on neonatal throat swabs of eight newborns and breast milk samples

of three mothers, and no positive results were reported. Furthermore, a US study of 43 women had no confirmed cases of COVID-19 detected in neonates upon initial testing on the first day of life. Similarly, a systematic review of 41 pregnancies in which the majority was delivered by CS, found no clinical signs of vertical transmission. Furthermore, studies assessed if there is an increased risk of vertical transmission associated with vaginal delivery. In a series of three cases of vaginal delivery in Wuhan cord blood and neonatal throat swab samples were collected within 12 h after delivery to determine if there was any neonatal infection with COVID-19 and did not find evidence of maternal-to-neonatal intrapartum transmission of COVID-19. More recently, an Italian study of 42 women, 24 of which gave birth vaginally, observed 2 early neonatal cases of COVID-19. However, they concluded that one was likely due to cross-contamination and the other due to early neonatal infection, but they could not entirely exclude the possibility of intrapartum transmission. In conclusion, they felt that vaginal delivery was associated with a low-intrapartum risk of transmission. There is one case report of severe COVID-19 in a diabetic patient with a positive neonate from a 16h swab, who was delivered by CS, which has also raised the possibility of vertical transmission.At present, the numbers are small and there are no data to suggest recommending either CS or vaginal delivery to reduce the risk of transmission to the neonate.

Conclusion

There is no significant effect of COVID 19 infection on maternal outcome in pregnancy and most of the complications were due to associated comorbidities like preeclampsia. The perinatal transmission of COVID 19 infection is very minimal. Timely isolation, counseling, Breast feeding methods and following strict COVID management protocol at our hospital resulted in better maternal and perinatal outcome.

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