

A Prospective Study of Feto-Maternal Outcome Among Covid-19 Positive Women Delivered in a Level III Covid Hospital at Moradabad, Western UP

Nupur Nandi

West Bengal University of Health Sciences College of Medicine and JNM Hospital

Ritika Agarwal (✉ Dritika2@yahoo.com)

VENKATESHWARA INSTITUTE OF MEDICAL SCIENCE

Garima Bajpai

Teerthanker Mahaveer University Medical College and Research Centre

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Abstract

Background: The ongoing pandemic situation by a highly infective Covid-19 virus is a global health threat. Pregnancy related physiological changes of cardio- respiratory system and relative immunosuppression might cause more infectivity and worsening complications of this novel respiratory virus infection. Limited data availability on fetomaternal outcome of Covid 19 positive pregnant women necessitates the current study.

Methodology: A prospective cohort study was conducted in a government designated level III Covid care hospital at Teerthankar Mahaveer Medical College & Research Centre to assess the fetomaternal outcome in Covid 19 RT-PCR test positive pregnant women delivered between April 2020 to September 2020. Mothers were evaluated in terms of asymptomatic status or predominant symptoms (fever, cough, sore throat, and breathlessness), complication if any including need for ventilatory support for extensive pneumonia, or mortality. Neonates were tested for presence of infection by RT-PCR test on day 2 & 5 of delivery, and also looked for any symptoms of the disease or its complication.

Results: Total 33 women with Covid19 positivity delivered at term pregnancy in the said period of 6 months. The most frequent (45.45%) age group was 26 to 30 years. Asymptomatic Covid 19 positive cases were more (57.58%) prevailing over symptomatic patients. Fever was most frequent (33.33%) physical symptom. Emotional quotient was significantly affected by presence of anxiety amongst 36.36%. Caesarean delivery conducted maintaining all protocol in 60.6% women, but all were indicated for other obstetric reason. None of the mother had developed significant pneumonia or other complication. One case of maternal mortality noted, but was not related to Covid 19 infection. Vertical transmission was nil in our study and no neonate was affected by any complication.

Conclusion: Course of disease was not different in pregnant women infected by Covid 19 virus in late pregnancy in comparison to non-pregnant adults. No case of vertical transmission noted, neither any neonatal morbidity nor mortality in present study, shows the importance of following optimum protocol. All pregnant women should be screened for Covid 19 infection in current scenario.

Introduction

India has been dealing with corona virus disease (COVID-19) pneumonia pandemic . It has been caused by the Severe Acute Respiratory Syndrome Corona Virus 2(SARS-CoV-2), The entire world has been effected by it . High maternal and foetal adverse outcome and mortalities has been associated with Viral pneumonia .¹ Viral pneumonia one of the very common non obstetrics complication of pregnancy.

Since its first identification in Wuhan, China, in December 2019, COVID-19 is highly infectious and has spread globally at an accelerated rate with rapid increase in cases and mortality ¹. Known Physiological changes during pregnancy, such as, elevation of diaphragm , respiratory tract mucosa becomes oedematous , reduced functional residual volume, as well as changes in immunity makes are person more prone for viral infections and infected women can have ominous outcomes.¹ Pregnancy-related

immunological and physiological changes has systemic effect on body, thus pregnancy can cause worsening of respiratory infections. Complication in COVID-19 pregnant women increases because there are physiological changes in cardiovascular system and respiratory system during pregnancy. Some of the changes are increased heart rate, oxygen consumption is more, stroke volume, and decreased pulmonary capacity and functional residual capacity.² Pregnancy is also associated with immunosuppression because of that pregnant women more susceptible to infectious diseases.²

There is a possibility of vertical transmission of SARS-CoV-2 from mother to fetus and creating significant infections in fetuses and neonates.²

Till now the data and studies have shown clinical, radiological, and laboratory characteristics of COVID-19 pneumonia in pregnant women are similar to those reported for non-pregnant patients. [3-6]

Government Health system and policies keeps on changing in countries affected by the pandemic. COVID-19 is a novel infection which is continuously evolving. There is uncertainty in its changing clinical course & symptoms, which makes it difficult to interpret results and findings. Which in turn makes it difficult to set guidelines for its management.⁷

Data on the maternal and perinatal outcomes of pregnant women infected with the SARS-CoV-2 are limited to a handful of case reports and series. The sample sizes were small and the findings were diverse in those studies.

This necessitates us to conduct the present study to assess the fetomaternal outcome among COVID-19 positive women delivered in a Level III covid hospital at Moradabad, Western UP.

Objective

The objective of the study is to determine the fetomaternal outcome among COVID-19 RT-PCR positive women delivered in a Level III covid hospital.

Methodology

Study Design

This is a prospective cohort study done from April 2020 to September 2020 over a period of 6 months.

All COVID-19 RT-PCR test positive pregnant women presented either at labour or with other obstetric causes for termination of pregnancy at Teerthanker Mahaveer Medical college and Research Centre (Government designated level III Covid Hospital) were taken as study subject. The study was conducted in the Department of obstetrics and gynecology. The study population was selected after taking informed written consent. All the study subjects received standard care discharged by Covid care team as defined by government protocol.

Various parameters which were taken into consideration to assess maternal outcome were- psychological stress, fever, cough, sore throat, breathlessness , ICU admissions, need for ventilator/BI-PAP support and mortality. Neonatal outcomes were assessed by knowing Covid status of baby tested on 2nd and 5th day of life, development of fever and pneumonia, need for ventilatory/C-PAP support.

All patients were followed up till their discharge from hospital which varied from time to time as per constantly evolving guidelines by the designated health committee of the government.

Results & Analysis

Initially pregnant patients with Covid-19 were scanty as per lower chance of exposure amongst pregnant women due to restricted outdoor activity. Total number of sample was 33 till 30th September 2020. All 33 diagnosed Covid 19 positive mothers came with term pregnancy either in labour or for other obstetric condition for need of immediate delivery. As our institution was working as government designated Covid-Care hospital from the very beginning, positive pregnant patients were referred from nearby government as well as private set-ups for deliveries. Out of 33, four patients had hypothyroidism (on medication), two were GDM (on diabetic diet only), and one reported with antenatal eclampsia.

Table 1: Age wise distribution of the study population

Age groups	Number	Percentage
20-25 years	13	39.40%
26-30 years	15	45.45%
More than 30 years	5	15.15%
Total	33	100.0%

Age distribution pattern shows maximum numbers of study population (45.45%) were in 26 to 30 years group. Numbers of pregnancy cases are more in 20 to 30 years of age group in general, so also reflected in our study population (85%).

Table 2: Showing History of exposure and COVID symptoms

	Number	Percentage
Asymptomatic	19	57.58%
Fever	11	33.33%
Cough	8	24.24%
Sore throat	4	12.12%
Anxiety	12	36.36%

All mothers had history of exposure to Covid positive individuals either in the family or in close contact.

Asymptomatic cases dominated (57.58%) over symptomatic (considering physical symptoms only) cases. Asymptomatic cases were diagnosed by following contact tracing protocol. Fever was most common (33.33%) presenting symptom. Many patients had multiple symptoms.

A large number (36.36%) were psychologically distressed by anxiety reflected by sleep disturbance, decreased appetite, increased heart rate, irritability etc.

Table 3: Showing the distribution of Mode of delivery

Mode of delivery	Number	Percentage
LSCS	20	60.6%
VD	13	39.4%

Table 4: Distribution of complications among study

Complications	Number	Percentage
Mortality	1	3.03%
Pneumonitis	0	0.0%

Table 3 showing 60.6% mothers were delivered by C section (but all were due to other obstetric indication).

Table 4 shows none of our study population had developed significant pneumonia. One case of mortality noted although not related to SARS CoV2 complication.

None of the neonates tested for SARS-CoV-2 viral nucleic acid on nasopharyngeal and oropharyngeal samples were resulted positive on day 2 and 5 evaluation as per government protocol. None of the babies had developed any sign of fever, pneumonia or any other morbid condition. No mortality noted.

Discussion

World Health Organisation (WHO) has reported that there is no apparent difference in the risk of developing clinical symptoms between non-pregnant and pregnant women of reproductive age.⁸

Patients most commonly present with mild symptoms of the infection including fever, cough, fatigue, and shortness of breath; however, many of them may be asymptomatic.^{3,8}

In a retrospective review by Liu et al, a comparison of 59 patients, which included both pregnant and non-pregnant adults women. There was no significant difference noted between the clinical features of SARS-CoV-2 in the 2 groups.⁴

One study showed Pregnancy does not worsen the symptoms or the findings on a CT scan of COVID-19 related pneumonia.¹

In our study, the most common symptom at presentation was fever among 33.33%, cough among 24.24% and sore throat among 12.1% women. None had developed breathlessness. The majority of the studies have supported the evidence of fever and cough as the most common presenting symptoms.^{3,8}

Data from China found severe complications among 8% pregnant women with coronavirus disease (COVID-19).¹

The UK Obstetric Surveillance System (UKOSS) in A prospective cohort study using found fever and cough as common symptoms in pregnant women having COVID-19 and less common symptoms include shortness of breath, diarrhoea, and myalgia.⁹

Our study shows 57.58% women were asymptomatic Covid positive diagnosed by contact tracing. In India there is reduced morbidity and mortality amongst Covid 19 positive. Study by Smith V et al found the majority of women being asymptomatic and afebrile at presentation.⁵

Shah et al, states most common presenting symptoms were cough (61.6%) and fever (46.4%). They noted 38.4% of pregnant patients were asymptomatic, most of these patients were diagnosed as having COVID-19 infection during intensive field testing and contact tracing during the initial phase of outbreak in India.

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36.36 % of the patients were complaining of distress and anxiety. A new highly infective disease with limited knowledge, patients were in isolation, health care professionals (wearing PPE) was new are some of the explanations for unusual development of significant anxiety.

In our study, among 33 deliveries, LSCS was performed among 60.6% and vaginal delivery among 39.39% women following all protocols. C. sections were done only for obstetric reasons not for Covid positive status in our study. Study by Muhidin et al reported that the preferred mode of delivery in Covid 19 infected mothers was caesarean section to reduce neonatal infection.¹⁰

Since there is limited evidence about vertical transmission and vaginal shedding of virus, vaginal delivery in stable patients may be considered.

Favre et al. suggested that for every individual patient, vaginal delivery by induction or instrumental delivery should be considered before caesarean section to avoid unnecessary surgical complications and maternal exhaustion.¹¹

Many of the studies showed, caesarean section was performed in the majority of cases and several authors cited fetal distress as the reason behind the decision.^{12,13}

Regarding the perinatal outcomes, not many adverse events were noted by most of the authors.^{14,15} Vertical transmission was not seen in our study also. All our study subjects were infected in the later part of pregnancy, might be the explanation for the same. None of the babies had any other morbidity or mortality as evaluated by designated protocol of our study. In contrast, *Zhu et al* reported one neonatal death and a total of 6 admissions to the neonatal intensive care unit (ICU). Shortness of breath was the first symptom observed in the 6 neonates. Other symptoms were fever, thrombocytopenia accompanied by abnormal liver function, tachycardia, vomiting and pneumothorax in his study.¹²

However, the severity of postnatally acquired disease in the newborn is unknown. A case series of 10 COVID-19 negative neonates born to COVID-19 positive mothers reported fetal distress, premature labor, respiratory distress, thrombocytopenia accompanied by abnormal liver function, and even death among neonates.⁶ This may indicate a possible association, but not necessarily a causal effect.

Conclusion

The available data revealed that clinical manifestations of pregnant women infected by SARS-CoV-2 in late pregnancy are similar to those of non-pregnant adults.

At present, there is no evidence regarding the greater risk of pregnant women to succumb to COVID-19 infection and experience severe pneumonia.

Present study shows Maternal morbidity was evident as cough, fever, sorethroat and anxiety. No evidence of maternal mortality noted due to Covid complication .

There was no evidence of vertical transmission and no fetal morbidity and mortality seen in our study. Following strict protocol at every stage of management of Covid 19 positive mother reduces chances of neonatal infection.

Overall, due to the lack of information on COVID-19 pneumonia in pregnancy, all suspected pregnant women should be systematically screened, monitored and followed up in current scenario.

Limitations

As novel corona virus infection is a new challenging situation, our study was limited to assess the obvious presentation and immediate outcome. All our samples contacted infection by SARS CoV2 in late pregnancy period, so evaluation of vertical transmission may not be the actual reflection. Long term studies are required to evaluate the all out effect of Covid-19 infection on maternal as well as fetal health.

Declarations

Disclosure of potential conflicts of interest : No

Research involving human participants : Yes

Informed consents : Informed and written consent taken

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Code availability :NO

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Consent to participate : WRITTEN TAKEN

Consent for publication : GIVEN

References

1. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020; 395:497–506.
2. Fan C, Lei D, Fang C, Li C, Wang M, Liu Y, et al. Perinatal Transmission of COVID-19 Associated SARS-CoV-2: Should We Worry? *Clinical Infectious Diseases*. 2020.
3. Yu N, Li W, Kang Q, Xiong Z, Wang S, Lin X, et al. Clinical features and obstetric and neonatal outcomes of pregnant patients with COVID-19 in Wuhan, China: a retrospective, single-centre, descriptive study. *Lancet Infect Dis*. 2020; 20(5):559 – 64.

4. Liu H, Liu F, Li J, Zhang T, Wang D, Lan W. Clinical and CT imaging features of the COVID-19 pneumonia: focus on pregnant women and children. *J Infect.* 2020; 80(5):e7-13.
5. Smith V, Seo D, Warty R, Payne O, Salih M, Chin KL, et al. (2020) Maternal and neonatal outcomes associated with COVID-19 infection: A systematic review. *PLoS ONE* 15(6): e0234187.
6. Shah PT, Shah SR, Shah SR, Yadav PA, Patel BS, Chudasama TJ. Fetomaternal outcome in COVID-19 infected pregnant women: a preliminary clinical study. *Int J Reprod Contracept Obstet Gynecol* 2020; 9:3704-16.
7. Zaigham M, Andersson O. Maternal and perinatal outcomes with COVID-19: A systematic review of 108 pregnancies. *Acta Obstet Gynecol Scand.* 2020; 99(7):823-9.
8. Liu D, Li L, Wu X, Zheng D, Wang J, Yang L, et al. Pregnancy and perinatal outcomes of women with coronavirus disease (COVID-19) pneumonia: a preliminary analysis. *Am J Roentgenol.* 2020; 215: 1–6.
9. Chen H, Guo J, Wang C, et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. *Lancet* 2020; 395:809 – 15.
10. Muhidin S, Behboodi Moghadam Z, Vizheh M. Analysis of Maternal Coronavirus Infections and Neonates Born to Mothers with 2019-nCoV; a Systematic Review. *Arch Acad Emerg Med.* 2020; 8(1):e49.
11. Favre G, Pomar L, Qi X, Nielsen-Saines K, Musso D, Baud D. Guidelines for pregnant women with suspected SARSCoV-2 infection. *The Lancet Infectious Diseases.* 2020.
12. Zhu H, Wang L, Fang C, Peng S, Zhang L, Chang G, et al. Clinical analysis of 10 neonates born to mothers with 2019-nCov pneumonia. *Transl Pediatr.* 2020; 9:51–60.
13. Liu Y, Chen H, Tang K, Guo Y. Clinical manifestations and outcome of SARS-CoV-2 infection during pregnancy. *J Infect.* 2020.
14. Liu Y, Zhao R, Zheng S. Lack of vertical transmission of severe acute respiratory syndrome coronavirus 2, China. *Emerg Infect Dis.* 2020; 26(6).
15. Wang S, Guo L, Chen L. A case report of neonatal COVID 19 infection in China. *Clin Infect Dis.* 2020. pii: ciaa225.

Figures

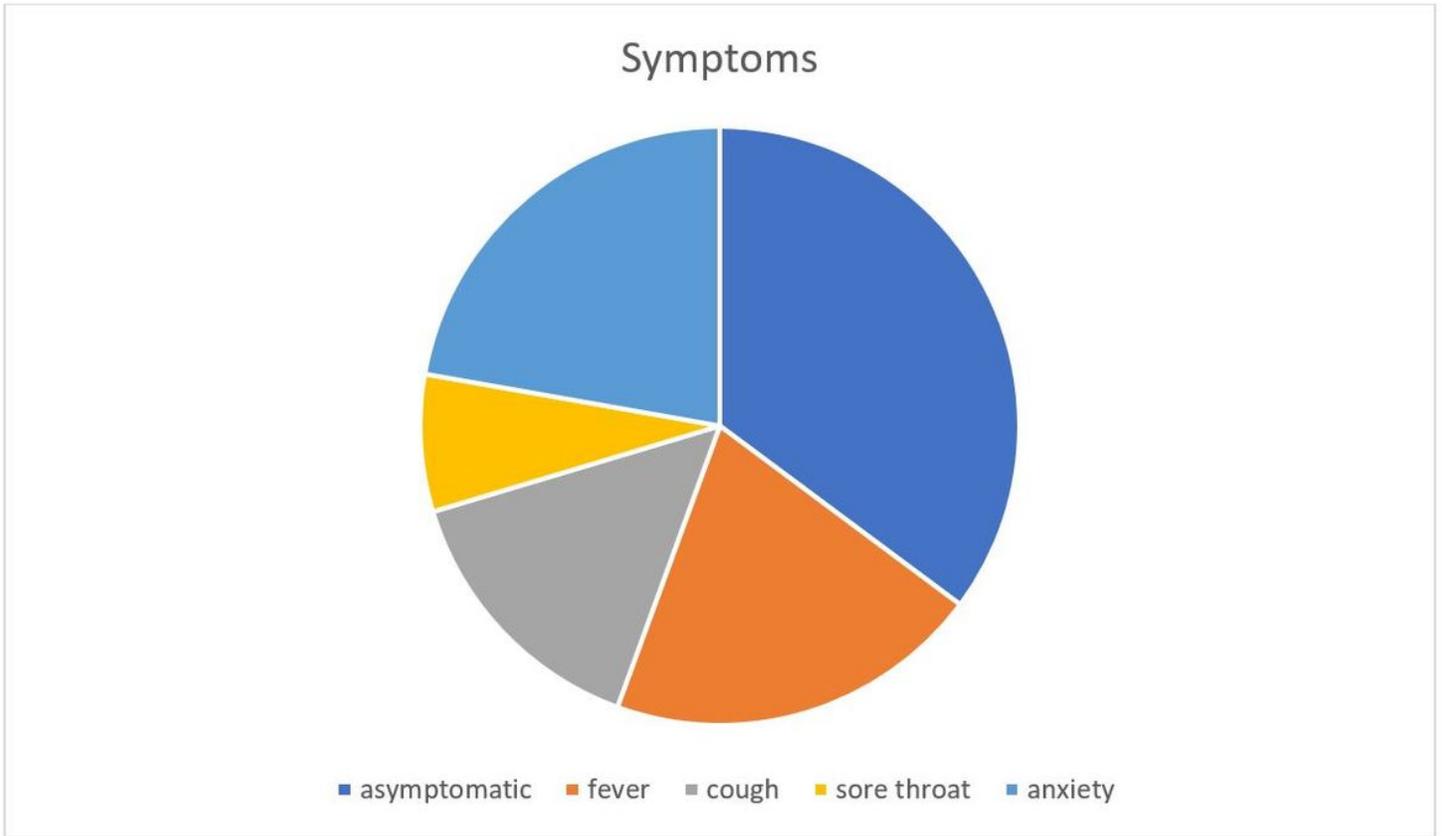


Figure 1

Asymptomatic cases dominated (57.58%) over symptomatic (considering physical symptoms only) cases. Asymptomatic cases were diagnosed by following contact tracing protocol. Fever was most common (33.33%) presenting symptom. Many patients had multiple symptoms.