



FETOMATERNAL OUTCOME IN COVID 19 POSITIVE MOTHERS – A PROSPECTIVE STUDY AT DEDICATED COVID HOSPITAL

Obstetrics & Gynaecology

Dr Sowjanya S B* Senior resident, OBGY, GMCH, Miraj *Corresponding Author

Dr Kiran Shriwathsav Assistant professor, OBGY, GMCH, Miraj

Dr. Asmita Vitthaladas Mundada

Dr Rokade Jyoti Vikas Associate professor, OBGY, GMCH Miraj

ABSTRACT

Background- The emergence of the novel coronavirus infection (SARS CoV-2) across the world is one of the most significant public health threats in current times. Very less data is available over the impact of virus on pregnancy. **Methods:** This is prospective study of 400 cases who were lab confirmed Covid-19 cases admitted between April 2020 and december 2020 at our tertiary care centre. **Results:** Most common presentation was cough (50%) and fever (30%), presented most commonly between 35-40weeks (78%), only 1.25% had saturation less than 80% and needed ICU admission with mechanical ventilation, 55% needed caesarean section as mode of delivery, 0.75% had maternal mortality due to ARDS. Neonatal positive rate was 6.25% however all of them went home well. **Conclusion:** Covid -19 is a novel disease and has become unprecedented global health problem. Further studies are required at global level to know the exact impact on pregnancy.

KEYWORDS

COVID-19, Maternal morbidity, Pneumonia, Pregnancy, SARS-CoV-2

INTRODUCTION

Covid 19 or SARS -2 virus has threatened the world being a global pandemic. The affection on vulnerable population as old age, with medical problems like diabetes, cardiac disease and pregnant women is of significance. The physiological changes occurring during pregnancy make the mother more vulnerable to severe infections¹. Anatomical changes such as an increase in the transverse diameter of the thoracic cage and an elevated level of the diaphragm, decrease maternal tolerance to hypoxia². Lung volume changes and vasodilation can lead to mucosal oedema and increased secretions in the upper respiratory tract. In addition, alterations in cell-mediated immunity contribute to the increased susceptibility of pregnant women to be infected by intracellular organisms such as viruses³. With regard to the foetus and the new-born, the immaturity of the innate and adaptive immune systems makes them highly susceptible to infections⁴. Dysregulation of factors such as cytokines and the complement cascade can have deleterious consequences for brain development and function⁵. To find out whether an infectious agent can infect the foetus or new-born by vertical transmission is therefore of particular interest⁶. Pregnant women and their new-borns should be evaluated for being potential risk groups in the current COVID.19 pandemic.

As it is a global pandemic, the present study was conducted to study the fetomaternal outcome in pregnant mothers diagnosed positive for covid 19 infection at dedicated covid hospital.

METHODOLOGY

It is a prospective observational study carried out on 400 pregnant patients tested positive for covid 19 infection at any stage of gestation in the period from April 2020 to December 2020.

All pregnant women of any gestational age, asymptomatic or symptomatic but tested for covid 19 by rapid antigen or RT PCR by nasopharyngeal swab are included in the study. The clinical history in detail of cough, fever, breathlessness, any obstetric complaints were noted. History of contact with positive patient, contact to infection interval noted. Obstetric intervention was done as per routine obstetric care following all guidelines of Government of India.

All patients were investigated for baseline haemoglobin, platelet, renal function test, liver function test, obstetric ultrasound. X ray chest, HRCT with abdominal shield were carried out if necessary. Physician consultation and advanced investigation as serum ferritin, D dimer, prothrombin time were carried out as and when needed. Obstetric

high-risk factors as anaemia, preeclampsia multiparity were noted. Patients were shifted to ICU with signs of pneumonia or fall in oxygen saturation. Patients with normal delivery were discharged on same medication and patients with caesarean section were administered 3rd generation cephalosporins with amikacin for 5 days. All patients were monitored for 10 days for oxygen saturation, recurrence of symptoms.

All new-born babies were subjected for RTPCR by nasopharyngeal swab. Patients were discharged with physician consultation for home isolation on day 10 without repeating swab.

RESULTS

During the study period, 400 patients were diagnosed with Covid-19 positive.

Majority (87.5%) belonged to age group less than 30 years and 78% presented at gestational age between 35-40 weeks. Out of 400 patients 288 (72%) had h/o contact with covid positive patients whereas 28 % could not recall about contact. The majority symptoms were cough, fever and sore throat (about 50%) whereas 30 % patients had severe bodyache and 12 % patients had diarrhoea.

Different medical high-risk factors associated with pregnancy were preeclampsia 156 (39%), Anaemia 112(28%) heart disease 6(1.5%) diabetes 3(0.7%). Obstetric high-risk factors previous LSCS 112 (28%) teenage pregnancy 4(1%) elderly age 12 (3%) obesity 15(3.75%) grand multipara 6(1.5%) malpresentation 103 (25.75%) preterm labour 20(5%), IUGR 20(5%) placenta previa 10(2.5%) placental abruption 2(0.5%).

Table no.1 – Patient characteristics

	Frequency	Percentage
Age (years)		
<30	350	87.5
30-34	38	9.5
35-39	10	2.5
>40	2	0.5
Total	400	100
Gestational age (weeks)		
<12	16	4
12-28	12	3
29-34	46	11.5

35-40	312	78
>40	14	3.5
Total	400	100
Symptoms		
Asymptomatic	36	9
Cough, sore throat, anosmia	200	50
Fever	120	30
Body ache	120	30
Breathlessness	12	3
Diarrhea	48	12
Medical- high risk		
Pre-eclampsia	156	39
eclampsia	8	2
Anemia	112	28
Heart disease	6	1.5
Diabetes	3	0.7
Obesity	15	3.75
Obstetric- high risk		
Teenage pregnancy	4	1
Elderly age	12	3
Grand multipara	6	1.5
Previous LSCS	112	28
Malpresentation	103	25.75
Preterm	20	5
IUGR	20	5
Placenta previa	10	2.5
Abruptio placenta	2	0.5

358 patients out of 400 had oxygen saturation >90 % on room air. 37 patients had saturation between 80 to 90 % needed oxygen support. 5 patients had severe hypoxia with spo2 <80 % needed intensive monitoring. Patients with saturation <90 % were admitted to Medical ICU. 6 patients had severe lung involvement with poor corad score (>32 /40). 3% needed evacuation and 1% remained undelivered (during our study period). 25% had full term 13.5% had preterm vaginal delivery. 55% had underwent LSCS with most common indications being fetal distress and previous LSCS. Complications noted were PPH (2.75%), need of massive blood transfusion (1%), mechanical ventilation (1.25%), AKI (0.5%), sepsis (1.5%), Wound dehiscence (1%), maternal mortality (0.75%). Maternal mortality was due to bronchopneumonia and ARDS.

Table no.2 Maternal outcome

Oxygen saturation (%)	F	%
>90	358	89.5
80-90	37	9.25
<80	5	1.25
Obstetric intervention		
MVA	12	3
FTND	100	25
PtVgD	54	13.5
IVD	10	2.5
LSCS 220 (55%)		
Fetal distress	99	45
Previous LSCS	75	34.09
Failure to progress	24	10.91
Malpresentation	10	4.54
Eclampsia	4	1.82
Severe oligo IUGR	4	1.82
CPD	2	0.91
APH	2	0.91
Undelivered	4	1
Medical treatment		
Antibiotic	400	100
Antiviral	26	6.5
Vitamin C, multivitamins with Zinc	400	100
Corticosteroids	28	7
LMWH	36	9
Anti-IL-6	0	0
Complications		
PPH	11	2.75
Massive blood transfusion	4	1
ICU admission with mechanical ventilation	5	1.25

AKI	2	0.5
Sepsis	6	1.5
Wound dehiscence	4	1
Maternal mortality	3	0.75

99.73% were live births with 0.27% macerated still birth and there were no fresh still births. 93.75% babies tested negative for covid-19 and positive babies were admitted in NICU for observation. Out of 384 babies, 120 needed NICU admission, prematurity being the most common cause. All babies were advised breast feeding as soon as possible with mask and proper sanitization. 11 babies unfortunately died during NICU stay due to prematurity followed by pneumonia however none of them were covid positive.

Table no.3 – Foetal outcome

n=384

RT PCR report	F	%
Positive	24	6.25
Negative	360	93.75
NICU admission	120	31.25
Prematurity	54	45
Neonatal jaundice	30	25
Birth asphyxia	10	8.33
Observation	26	21.67
Outcome		
Live birth	383	99.73
Fresh still birth	0	0
Macerated still birth (IUFD)	1	0.27
Neonatal death	11	2.86

DISCUSSION

The first cases of COVID-19 pneumonia were reported in December 2019 from Wuhan, Hubei Province in China. Since then, the infection has rapidly spread all over the world⁸. This study is among the first to report COVID-positive maternal and neonatal clinical characteristics and outcomes with a comparatively large sample size.

Clinical presentation:

In the present study, 91% were symptomatic with cough and fever being the most common complaints which is similar to previous studies⁹⁻¹³. Similarly, a retrospective study found that common symptoms in pregnant women in the wake of SARS-CoV-2 infection are cough and fever, and less common symptoms include shortness of breath, diarrhea, and myalgia¹³. On the contrary, a study found the majority of women being asymptomatic and afebrile at presentation¹³ it may be due to testing of all women irrespective of symptoms. But, the majority of the studies have supported the evidence of fever and cough as the most common symptoms⁹⁻¹³. The clinical features of pregnant women with SARS-CoV-2 infection were similar to those of the general population having SARS-CoV-2 infection, as reported in previous studies¹³. A prospective cohort study using UKOSS found that most women were hospitalized in the 3rd trimester¹⁴. Similarly other studies show that majority of pregnant women with COVID-19 positive were in the late second or third trimester¹⁵ which was true in the present study. It is due to the fact that many pregnant women approached health facility for confinement and that is when testing was done. The government analysed the data based on clinical and demographic details from 9,485 patients across 40 hospitals in India between the month of September-November 2020 and March-April 2021 and it was found that demand of medical oxygen was higher during the second wave of covid-19 pandemic in comparison to the first spell whereas the need of ventilators was lower. In our study 42 patients out of 400 needed oxygen support and only 1.25% had severe hypoxia. We could not find a correlation of this with general population but study conducted by Dr Vijaykumar jain¹⁶ states clearly that the need for oxygen was lower in first wave and also it affected more of older population as compared to younger.

Maternal outcome-

Majority of the deliveries were done by caesarean section (55%) which was similar finding in several studies^{13,17,18,19} and authors and fetal distress being cited as the most common indication¹³. Acute fever episode, dehydration, hypoxia may be the contributing factor for fetal distress, however as such covid positive status is not an indication for caesarean section. Only 1.25% needed ICU admission with mechanical ventilator support in the present study. In a case series only 5% and in another study only 2 patients needed critical care^{13,20}. The

rates of ICU admission and mortality among pregnant women admitted to hospital with COVID-19 are found to be similar to that of general population²¹. Moreover, the rate of severe pneumonia in pregnant women was also not greater than that of general population²¹.

Fetal outcome-

RCOG, in consultation with the RCPCH, have provided guidance for delivery and neonatal care, which recommends that mode of delivery be determined primarily by obstetric indication, and recommends against routine separation of COVID-19-affected mothers and their babies²². Similarly, in the present study, all babies were advised breast feeding as soon as possible with mother wearing mask and proper sanitization. In a study conducted by Jiajun Yuan²³ the positive rate of neonate is 3.28% whereas our study its 6.25%.

Newborns born to SARS-CoV-2 infected mothers are mostly asymptomatic⁹. Similarly, in another study, 73.3% of the neonates, born full-term, were asymptomatic¹³. 6.25% of babies who came positive were admitted in NICU for observation and all of them remained asymptomatic and discharged on day 5 of birth. So these studies assure good foetal outcome however, in the present study, there were 11 neonatal death mainly due to prematurity and pneumonia which was comparable with the general population.

The major strength of this study is the large sample size when compared to prior studies. However, Long term studies are required to evaluate the all-out effect of Covid-19 infection on maternal as well as fetal health.

CONCLUSION

Covid 19 disease is novel disease, wherein the whole world is perplexed in formulating the management protocol and it is not over yet. We are still battling the disease. Assessment of current knowledge about viral characteristics, disease epidemiology, immunopathology, preventive measures, therapeutic strategies is much needed in order to know the exact impact of the disease on pregnancy.

REFERENCES

- Goodnight WH, Soper DE. Pneumonia in pregnancy. Crit Care Med. 2005;33:S390.S397. [PubMed] [Google Scholar]
- O'Day MP. Cardio-respiratory physiological adaptation of pregnancy. Semin Perinatol. 1997;21:268.275. [PubMed] [Google Scholar]
- Nelson-Piercy C. Respiratory disease In: Handbook of Obstetric Medicine. Boca Raton: CRC Press; 2015:371 p. [Google Scholar]
- van Well GTJ, Daalderop LA, Wolfs T, Kramer BW. Human perinatal immunity in physiological conditions and during infection. Mol Cell Pediatr. 2017;4:4. [PMC free article] [PubMed] [Google Scholar]
- Tsafaras GP, Ntontsi P, Xanthou G. Advantages and limitations of the neonatal immune system. Front Pediatr. 2020;8:5. [PMC free article] [PubMed] [Google Scholar]
- Chan GJ, Lee AC, Baqui AH, Tan J, Black RE. Risk of early-onset neonatal infection with maternal infection or colonization: a global systematic review and meta-analysis. PLoS Med. 2013;10:e1001502. [PMC free article] [PubMed] [Google Scholar]
- Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet. 2020;395:497-506.
- World Health Organization. Novel Coronavirus – China. 2020. <https://www.who.int/csr/don/12-january-2020-novel-coronavirus-s-china/en/>. Accessed March 24, 2020.
- 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.
- Chen H, Guo J, Wang C, Luo F, Yu X, Zhang W, 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.
- Chen L, Li Q, Zheng D, Zhao Y, Qiao J. Clinical characteristics of pregnant women with covid-19 in Wuhan, China. N Engl J Med. 2020;382:e100
- 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:e49.
- Amal Ayed1, Alia Embaireg2, Asmaa Benawadh1, Wadha Al-Fouzan3, Majdeda Hammoud4, Monif Al-Hathal5, Abeer Alzayda6, Ashraf Ahmad1 and Mariam Ayed, Maternal and perinatal characteristics and outcomes of pregnancies complicated with COVID-19 in Kuwait, BMC Pregnancy and Childbirth (2020) 20:754 <https://doi.org/10.1186/s12884-020-03461-2>
- Coronavirus infection and pregnancy. The Royal College of Obstetricians and Gynaecologists. 2020. <https://www.rcog.org.uk/en/guidelines-researchservices/guidelines/coronavirus-pregnancy/covid-19-virus-infection-andpregnancy/>. Accessed 5 July 2020.
- Knight M, Bunch K, Vousden N, Morris E, Simpson N, Gale C, et al. Characteristics and outcomes of pregnant women admitted to hospital with confirmed SARS-CoV-2 infection in UK: national population-based cohort study. BMJ. 2020;369:m2107.
- Vijay Kumar Jain et al, Differences between First wave and Second wave of COVID-19 in India Elsevier public health emergency collection. Diabetes Metab Syndr. 2021 May-June; 15(3): 1047–1048.
- 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;395:809-815.
- 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:e7-e13.
- Zhang I, Jiang Y, Wei M, et al. [Analysis of pregnancy outcomes of pregnant women during the epidemic of new coronavirus pneumonia in Hubei]. Zhonghua Fu Chan Ke Za Zhi. 2020;55(0):E009. (in Chinese)
- Breslin N, Baptiste C, Gyamfi-Bannerman C, Miller R, Martinez R, Bernstein K, et al.

COVID-19 infection among asymptomatic and symptomatic pregnant women: two weeks of confirmed presentations to an affiliated pair of New York City hospitals. Am J Obstet Gynecol MFM. 2020;2:100118.

- Yan J, Guo J, Fan C, Juan J, Yu X, Li J, et al. Coronavirus disease 2019 (COVID-19) in pregnant women: a report based on 116 cases. Am J Obstet Gynecol. 2020; 223(1): 111. e1–111.e14.
- Royal College of Obstetricians Gynaecologists, Royal College of Midwives. Coronavirus infection in pregnancy: Information for healthcare professionals. Available at: <https://www.rcog.org.uk/global...> Published April 9, 2020. Accessed on 13th 2020.
- Jiajun Yuan et al, The impact of the COVID-19 pandemic on maternal and perinatal health: a scoping review Reprod Health. 2021; 18: 10