



EPIDEMIOLOGY OF COVID 19 IN PREGNANCY IN THE SECOND WAVE OF PANDEMIC A RETROSPECTIVE STUDY

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Abstract

Background: Covid 19 pandemic so far followed pattern of exponential surge in new cases followed by decline.

Objective: To assess risk factors, demographic features, obstetric outcome, maternal morbidity and mortality of COVID-19 infection in pregnant and postpartum women admitted during second wave covid pandemic.

Material and Method: This retrospective observational study was conducted at tertiary teaching Hospital in metropolitan city, the dedicated COVID hospital in Pune during period of 1st July 2021 to 30th September 2021. Study group cases were tested for SARS-COV-2 infection by nasopharyngeal swab (NPS) test by RT-PCR.

Results: During study period, 2976 pregnant and postpartum women were admitted in hospital, out of which 180 cases were enrolled in study. 35 women from study group had additional co-morbidities. Pre-eclampsia 12 (6.6%) being most common risk factor followed by anaemia 9(5%). The most common symptoms was fever that affected 39 (21.6%) followed by cough 34(18.8%), myalgia 16 (8.8%) & dyspnea 10(5.5%). A total of 4.4% of pregnant women were admitted in ICU & 7.2% required mechanical ventilation. Caesarean delivery was observed in 65(36.1%) cases while 37(20.5%) cases underwent normal delivery. 4 (2.2%) women had preterm delivery.

Conclusion: Adverse maternal and neonatal outcome was observed in second wave covid pandemic. Preterm birth rate was not observed higher in second wave in present study

Keywords: Covid 19, epidemiology, second wave, ARDS, Preeclampsia

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Introduction:

Covid-19 pandemic so far followed pattern of exponential surge in new cases followed by decline. This increase or decline in covid 19 cases could be due to many factors like changes of corona virus strain (mutation), vaccination, infection prevention, immunity of people and travel history from covid infected area. Similar to several parts of world India experienced second wave of covid 19 pandemic. The pan-India second wave began from April 2021 onward with steady increase followed by surge in covid 19 case. This surge was due to contagious delta variant and waning immunity and also relaxation in precautionary measures by people for infection prevention. Vaccination was very effective for prevention of serious illness, hospitalisation and death from covid 19¹. The first case of the COVID-19 pandemic in the Indian state of Maharashtra was confirmed on 9th March 2020 in Pune city. The state has confirmed 59.7 lakh cases and 1.18 lakh deaths on 21st June 2021.² The patient can present with an array of symptoms, most commonly presenting with complaints of cold, cough, fever, malaise, headache, itching or watering in the eye.^{4,5} During pregnancy, rise in estrogen and progesterone and altered immune status cause upper respiratory tract to get more easily infected⁶. Data are also emerging on the clinical course of COVID-19 in pregnant patients, pregnancy outcomes in the setting of COVID-19 and vertical transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)⁷. COVID 19 infection among pregnancy is not only a significant public health issue, but it also represents an obstetric management issue in determining the care received by pregnant women. In this pandemic, it becomes imperative to study the effects of the infection on pregnancy⁸. It is important healthcare providers are aware that pregnant women with COVID-19 and their newborn babies may be more likely to need specialist care and that women and their babies have access to this care. This is particularly true for pregnant women with COVID-19 alongside other co-morbidities or risk factors. The epidemiological characteristic differed in various countries as well as localities so there is need to know variations occurring in our locality. Objective of this study was to describe clinical characteristics and obstetric outcome of pregnant and postpartum women admitted to hospital with SARS cov-2 infection. To assess the maternal morbidity and mortality due to covid-19 infection in the pregnancy. To study association of comorbidities with the outcome in pregnant woman due to COVID 19 infection.

Material and method: This retrospective observational study was conducted at tertiary teaching Hospital in metropolitan city, the dedicated COVID hospital in Pune during period of 1st July 2021 to 30th September 2021 after approval from institute ethical committee. We included all pregnant and postpartum women admitted in SGH during 1st July 2021 to 30th September 2021 who were found infected with SARS Cov-2 during universal screening and who came with positive swab report. Study group cases included women aged 15 -49 years with detection of SARS Cov-2 viral RNA on polymerase chain reaction testing of nasopharyngeal swab as per ICMR guidance. At time covered by study, women were tested only if they had symptoms of SARS cov-2. Data regarding demographic characteristics, obstetric, medical history, clinical findings, lab reports, maternal complications, obstetric outcome was studied from medical & labour records of asymptomatic pregnant & postpartum women.

COVID-19 confirmed cases were assessed for severity of COVID-19 symptoms by multidisciplinary team approach including medical specialist, pulmonologist and obstetrician. Classification of disease severity & management protocol was followed according to MoHFW guidelines⁷.

Statistical Analysis

Quantitative data was presented as means + standard deviation (SD). Qualitative data was presented as frequencies

Results

During 1st July 2021 to 30th September 2021 there were total 180 pregnant and postpartum hospitalised women with confirmed SARS cov-2 infection. During study period 2976 pregnant & postpartum women were admitted in hospital while total number of deliveries was 2297. 180 cases were found to be positive during study period. Data on laboratory confirmed covid 19 pregnant and postpartum hospitalized women were recorded. During study period, among 180 covid 19 hospitalized women aged 15 to 49 years, 172 were pregnant (%) with mean age 23.8 +3.65 years. Among 172 pregnant women there was one case of ectopic pregnancy. There was one postabortal case of retained product of conception required dilatation & evacuation. Among 7 post partum women 4 were post cesarean cases while 3 were post vaginal delivery. 69 cases were managed conservatively & had on going pregnancy at time of data collection. Hence delivery details & obstetrics outcome was documented for remaining 102 women. Approximately one third of them were

symptomatic (n-60, 33.3%) with covid-19 related illness. During study period there were 2976 deliveries.

Table 1: Distribution of demographic characteristics & obstetric details of women in study group

S.N	Maternal Characteristics	Frequency	Percentage
1	Age in Yrs		
	< 20	4	2.22
	20-30	126	70
	31-40	49	2
	>40	1	0.5
2	Parity		
	Nulliparous	89	49.44
	Multiparous	91	50.55
3	Gestational age in weeks		
	<28	32	18.6
	28-37	46	26.7
	>37	94	54.65
	Postpartum	7	3.8
	Postabortal	1	0.5
4	Reason for hospital admission		
	Covid 19 related illness	60	33.33
	Obstetric or labour	120	66.66
5	Heamodynamic condition		
	Heamodynamically stable	164	91.11
	Heamodynamically unstable	16	8.88

Table 1 shows demographic characteristics & obstetrics details of women in study group. The mean age of study participant was 23.8+3.65years.99 cases from study group were

from gestational age group of more than 37 wks. While 75 Cases had history previous Caesarean section. 33% were admitted with covid-19 related illness.

Table 2: Symptoms and characteristics of Covid 19 infected pregnant women

S.N	Symptoms	Frequency	Percentage
1	Fever	39	21.66
2	Dry Cough	28	15.55
3	Cough with sputum	6	3.33
4	Myalgia	16	8.88
5	Dyspnea	10	5.5
6	Loss of taste	3	1.6
7	Oxygen Saturation		
	<90	6	3.33
	90-94	8	4.44
	>94	166	92.22
9	Needed non-invasive mechanical ventilation	7	3.88
	Needed invasive mechanical ventilation	6	3.33
10	C-Xray finding		
	Infiltrate with 6 zone disease	11	6.11
	Pleural effusion	2	1.11
	Interstitial disease	3	1.6
	Chest CT scan finding		
	Ground glass opacity	2	1.11
	Patchy shadow	1	0.5

Clinical symptoms & imaging study parameters in study populations is shown in table-2. The most common symptoms was fever that affected 39(21.6%) followed by cough 34 (18.88%)& myalgia16(8.8%)&dyspnea10(5.5%).A total of 4.4% of pregnant women were admitted in ICU & 7.2% required mechanical ventilation. The

radiological diagnosis of pneumonia was made in 11(6.1%) cases. The most common CXR imaging feature in pregnant women infected with covid-19 was infiltrate with haziness & 6 zone disease followed by interstitial disease while computed tomography imaging feature was ground glass opacity.

Table 3: Distribution of medical & obstetric risk factors in study group

S.N	Medical & obstetric risk factors	Frequency	Percentage
1	Pre-eclampsia	12	6.66
2	Anaemia	9	5
3	Hypothyroidism	8	4.44
4	GDM	2	1.11
5	Cardiac disease	1	0.5
6	Chronic Hypertension	1	0.5
7	Pulmonary TB	1	0.5
8	Type -2 DM	1	0.5
9	HIV	1	0.5

Table 3 shows medical & obstetric risk factors identified in study group. Most common co-morbidity found among pregnant women infected with COV-2 was preeclampsia 12 (6.6%) followed

by anaemia 9 (5%) followed by hypothyroidism 8(4.4%) while cardiac disease, pulmonary kochs, type 2 diabetes each was observed in 0.5% cases.

Table 4: Hospital outcome and parameters of Covid 19 women

S. N	Hospital outcome	Frequency	Percentage
1	ICU admission		
	<7 days	5	2.7
	>7 days	3	1.6
2	Maternal Deaths	5	2.7
3	Maternal complications		
I	ARDS	3	1.6
Ii	ARF	2	1.11
Iii	Pneumonia	1	0.5
Iv	Sepsis	1	0.5
v	Pulmonary embolism	1	1.11
4	Covid 19 Rx received		
I	Antibiotic	60	33.33
Ii	Antiviral	11	6.11
Iii	Steroid	8	4.44
iv	HCQ	9	5

TABLE 4 shows outcome of the covid 19 cases & treatment received. Serious infection requiring ICU admission was observed in 8(4.4%) cases. Maternal complication like ARDS was found in 3(1.6%) cases. Maternal deaths occur in 5 (2.7%) cases. Respiratory failure with covid 19 pneumonia was leading cause in 3 cases followed by

pulmonary embolism in 1& sepsis in 1 case. Women affected by covid 19 were usually treated by antibiotics 60(33.3%) while antiviral in 11(6.1%) steroid in 8(4.4%) cases respectively. In this study oseltamivir was most commonly used antiviral therapy while most common antibiotic used for treatment azithromycin`

Table 5: Obstetric outcome of Covid 19 women

S.N	Obstetric outcome	Frequenc y	Percenta ge
1	Ongoing pregnancy	69	38.33
2	Miscarriage	4	2.22
3	ND	37	20.55
4	LSCS	66	38.37
i	Emergency LSCS	59	32.77
ii	Elective LSCS	7	4.06
5	PPH	1	0.5
	Preterm birth	4	2.22

Table 5 shows effect of SARS cov-2 in pregnant women & obstetric outcome. In present study miscarriage was found in 4(2.2%) cases.

Caesarean delivery was observed in 65(36.1%) cases while 37(20.5%) cases underwent normal delivery. 10(5.5%) required induction of labour.

Discussion

There were 60 symptomatic covid 19 in 2976 hospitalised pregnant and postpartum women while asymptomatic covid 19 women were 120.

We reported epidemiological, clinical characteristics & also maternal morbidity and mortality due to covid 19 infection in pregnant and postpartum women during second wave from 1st July 21 to 31stSeptember 2021. From clinical experience of first wave, covid 19 infection was detected early in second wave & received more effective treatment leading to reduce cases of serious infection hence few cases were reported with ICU stay for more than 7 days. It is possible that all severe covid 19 infections getting admitted at our dedicated covid 19 hospital hence present study found 3.3% maternal death.

The predominant symptoms in second wave presented were fever, cough, myalgia similar to other studies ^{9,10}13(7.2%) patients required invasive mechanical ventilation methods & 8(4.4%) ICU admission. Many studies reported fever ICU admission & less serious illness in second wave compared to first wave⁹ while few studies^{11,12} noted serious covid illness requiring ICU admission & oxygen therapy was increased significantly in second wave.

Limitation of present study was lack of comparison between first & second wave of covid 19 pandemic and analysis of severity of disease according to gestational age. Unlike previous studies^{13,14,15,16} preterm rate was not higher in present study there is heterogeneity of data regarding adverse obstetrics and perinatal outcome and second wave of pandemic few studies ^{14,15}adverse effect. While few studies ^{17,18} contradict the poor outcome. Fever, cough and myalgia were most common clinical features while predominant imaging finding in

CXR was infiltrate in haziness in second wave of covid pandemic. Caesarean delivery rate was higher compared to general population which could be due to associated co morbid conditions. Maternal death occurred in 5 study group cases it could be because of higher referral to designated tertiary covid hospital due to increased severity of covid-19 & associated comorbidities. There is heterogeneity of data regarding deterioration of covid 19 infection and worse disease outcome in second wave. Few studies ^{14,15,16} support serious complications of covid 19 infections in pregnancy requiring ICU admission, mechanical ventilation, development of ARDS while few studies ²⁰contradict the same. Recent metaanalysis noted that medical co morbidities were more prevalent in second wave leading to higher frequency of ICU admission, ARDS and mechanical ventilation. Literature review show that adverse maternal and neonatal outcome was higher in second wave compared to first wave. Exact cause of higher complication rate in second wave is unknown but can be due to more prevalent co morbidities in hospitalized patients in second wave.

Conclusion

Obstetric outcome in terms of preterm birth was not reported higher in women with second wave. Adverse maternal and neonatal outcome was higher in second wave. Exact cause of higher complication rate in second wave is unknown but can be due to more prevalent co morbidities in hospitalized patients in second wave.

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