

Clinical profile and outcome of COVID-19-positive pregnant mothers admitted in a tertiary care center: A retrospective cohort study from Mizoram, India



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ABSTRACT

Background: The clinical profile of COVID-19-positive pregnant mothers and their outcome has not been studied in Mizoram. **Aims and Objectives:** The objectives was to study the clinical profile of COVID-19-positive pregnant mothers and also to study the positivity rate among the babies born to those pregnant mothers. **Materials and Methods:** This study was a retrospective cohort of COVID-19-positive pregnant mothers who were admitted in a tertiary care center in Mizoram from July 2020 to September 2021. The data were collected from the case sheets of the patients retrospectively. The babies were also tested for COVID-19 after 24 h after birth by rapid antigen test (RAT). $P < 0.05$ was considered statistically significant. Data analysis was done by coGuide Statistics software, Version 1.0. **Results:** Out of 81 COVID-19-positive pregnant mothers, majority 56 (69.14%) were in the age group 19–25 years. Only 6 (7.41%) were vaccinated. The most common symptoms observed were fever 35 (43.21%) followed by cough 28 (34.57%). Sixty-five (80.25%) were full term at the time of admission and 36 (44.44%) were primigravida. The mode of delivery was full-term cesarean section 55 (67.90%), term normal vaginal delivery 21 (25.93%), hysterotomy 3 (3.7%), abortion 1 (1.23%), and pre-term vaginal delivery 1 (1.23%). The mortality among pregnant mothers was 3 (3.70%). The positivity rate for babies tested by RAT was 2 (2.47%). **Conclusion:** The mortality among pregnant mothers was 3.70% and the COVID-19 positivity rate among newborn babies was 2.47%.

Key words: Antenatal; Corona virus; Mortality; Transplacental transmission

INTRODUCTION

As on date May 10, 2023 (04:38 GMT), the total number of persons infected with COVID-19 around the world is 688,010,809 with 6,872,321 deaths.¹ In spite of so many infected cases and deaths, the routine life has to move on with lock down. Pregnancy and getting pregnant and child birth are also one such routine part of life which cannot not ignored due to COVID-19 pandemic.

In 2021, in India, the reported number of births was 24.02 million.² Hence, pregnant women infected with

COVID-19 had become an area of interest and also there existed a knowledge gaps related to maternal outcome, clinical symptoms, COVID-19 positivity among the newborn, and epidemiology of COVID-19 pregnant mothers.³ The clinical profile of COVID-19-positive pregnant mothers and their outcome has not been studied in Mizoram.

Aims and objectives

Hence, our study objectives are to study the clinical profile of COVID-19-positive pregnant mothers and also to study the positivity rate among the babies born to those pregnant mothers.

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MATERIALS AND METHODS

This study was a retrospective cohort study of COVID-19-positive pregnant mothers who were admitted in a tertiary care center in Mizoram from July 2020 to September 2021. The data were collected at the time of admission and also the pregnant mothers were followed up until they deliver the baby. The babies were also tested for COVID-19, after 24 h after birth. Rapid antigen test (RAT) after 24 hours was considered as outcome variable. The data were collected from the case sheets of the patients retrospectively.

Primary variables age, baby gender, etc., were considered as the study relevant variables. Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency, and proportion for categorical variables. The association between explanatory variables and categorical outcomes was assessed by cross-tabulation and comparison of percentages. The data were entered in excel. $P < 0.05$ was considered statistically significant. Data analysis was done by coGuide Statistics software, Version 1.0.⁴ The study was ethically cleared from the Institutional Ethical Committee of Zoram Medical College, Mizoram dated August 17, 2021 (N0 F. 20016/1/18-ZMC/IEC/36).

RESULTS

Table 1 shows the baseline characteristics of the COVID-19-positive pregnant mothers. Majority were in age group 20–25 years (69.14%) and majority were not vaccinated (92.59%). About 80.25% of the study population got admitted when they were full term. The most common symptoms observed were fever (43.21%) and cough (34.57%) (Table 1).

Table 2 shows that mortality among COVID-19-positive pregnant mothers was 3.70%. The table also shows the various treatment given, comorbidity observed, gravida of pregnancy, and mode of delivery (Table 2).

Table 3 shows the baseline characteristics of the newborn babies born to COVID-19-positive mothers. About 53.09% were female babies, 69.14% were born in the weight range 2.5–3.5 kg. Majority had an APGAR score of 7–10 (85.19%). The positivity by RAT among the newborn babies was 2.47%. Congenital anomaly was also detected in 2.24% of the babies born (Table 3).

Table 4 shows the comparison of various factors such as mothers age at the time of delivery, weight of the newborn

Table 1: Baseline characteristics of COVID-19 pregnant mothers (n=81)

Variables	Frequency	Percentage
Age in years		
<19	10	12.35
20–25	56	69.14
>26	15	18.52
Vaccination status		
Vaccinated	6	7.41
Not Vaccinated	75	92.59
Period of gestation at the time of admission/delivery		
1 st trimester	1	1.23
2 nd trimester	15	18.52
3 rd trimester (Full term)	65	80.25
COVID-19 symptoms		
Fever	35	43.21
Cough	28	34.57
Tiredness	14	17.28
Headache	11	13.58
Loss of taste or smell	15	18.52
Aches and pain	7	8.64
Sore-throat	9	11.11

Table 2: Descriptive analysis of outcome, treatment given, comorbidity, gravida, and mode of delivery among COVID-19-positive pregnant mothers (n=81)

Outcome	Frequency	Percentage
Recovered	78	96.30
Death	3	3.70
Treatment		
Zinc	51	62.96
Vitamin C	50	61.73
Vitamin D	49	60.49
Paracetamol	35	43.21
Remdesivir	34	41.98
Methylprednisolone	32	39.51
Pantop	27	33.33
Ceftriaxone injection	21	25.93
Oxygen therapy	18	22.22
Doxycycline	2	2.47
Ivermectin	2	2.47
Azithromycin	1	1.23
Cough syrup	4	4.94
Doxycycline	2	2.47
Comorbidity		
Diabetes mellitus	1	1.23
Hypertension	1	1.23
Cancer	1	1.23
Gravida of pregnancy		
Primi	36	44.44
Multi	45	55.56
Mode of delivery		
Abortion	1	1.23
Hysterotomy	3	3.70
Preterm vaginal delivery	1	1.23
Term normal delivery	21	25.93
Term cesarean section	55	67.90

baby, and gender of the newborn baby against the RAT outcome of the babies (Table 4).

DISCUSSION

In the present study, majority of the pregnant mothers were in the age group 20–25 years (69.14%), but we can also see the teenage pregnancies accounted for 12.35%. According to the national family health survey-4 that among young women aged 15–19 year in Mizoram, 7% have already begun childbearing, that is, they have already had a live birth or are pregnant with their first child.⁵ The increase in teenage pregnancies can also be attributed to the COVID-19 pandemic and lock down. A study done by Zulaika et al., on the impact of COVID-19 lockdowns on adolescent pregnancy, showed that girls experiencing COVID-19 containment measures has twice the risk of falling pregnant when compared with pre-pandemic cohort.⁶

Table 3: Baseline characteristics of the newborn (n=81)

Variables	Frequency	Percentage
Baby sex		
Male	36	44.44
Female	43	53.09
Abortion	2	2.47
Weight of baby		
<2.5	13	16.05
2.5–3.5	56	69.14
>3.5	12	14.81
Apgar score		
0–3	8	9.88
4–6	4	4.94
7–10	69	85.19
Rapid antigen test after 24 h after delivery	Frequency	Percentage
Positive	2	2.47
Negative	75	92.59
Not done	4	4.94
Congenital anomaly	Frequency	Percentage
Nil	79	97.53
Present	2	2.47

Table 4: Comparison of various factors with rapid antigen test after 24 h after delivery of the newborn baby (n=81)

Variables	RAT after 24 h			P-value
	Positive (n=2)	Negative (n=75)	Not done (n=4)	
Gender of the newborn baby				
Male (n=36)	1 (2.78)	33 (91.67)	2 (5.56)	0.747
Female (n=43)	1 (2.33)	41 (95.35)	1 (2.33)	
Age group of the mothers				
<19 (n=10)	0 (0.00)	10 (100.00)	0 (0.00)	*
20–25 (n=56)	2 (3.57)	51 (91.07)	3 (5.36)	
≥26 (n=15)	0 (0.00)	14 (93.33)	1 (6.67)	
Weight of the newborn baby				
<2.5 (n=13)	0 (0.00)	10 (76.92)	3 (23.08)	*
2.5–3.5 (n=56)	2 (3.57)	53 (94.64)	1 (1.79)	
>3.5 (n=12)	0 (0.00)	12 (100.00)	0 (0.00)	

*Values in some cells were zero; hence, P value cannot be calculated

In the present study, nearly 92.59% of the pregnant mothers were not vaccinated that this is because the study was done during the period from July 2020 to September 2021. When initially the vaccine was rolled out, the vaccines were given first only to the doctors and paramedics and then to the general population. The COVID-19 vaccine in India was first rolled out on January 16, 2021.⁷

The pregnant mothers were the last one to receive after conducting all the safety tests. The Ministry of Health and Family welfare on July 2, 2021 declared based on the recommendations from national technical advisory group on immunization approved the COVID-19 vaccination for pregnant mothers.⁸ Hence, the time duration in which the present study was done, vaccination was not mainly advocated for pregnant mothers, that was the reason, only 7.41% of pregnant mothers were vaccinated.

In the present study, majority of the pregnant mothers were admitted during the gestational age of second and third trimester. This was comparable and similar with other studies done by Chen et al.,⁹ Khoury et al.,¹⁰ Pierce-Williams et al.,¹¹ Karimi et al.,¹² and Woodworth et al.¹³

The most common symptoms observed in the present study was fever (43.21%) and cough (34.57%), this was similar to a systematic review done by Vera et al.¹⁴

The COVID-19 positivity rate among the newborn babies in the present study was 2.47%. This finding was similar to the CDC cohort, which also reported 2.6%.¹³ The RAT for the newborn babies was mostly done within 48 h after delivery, and hence, we may conclude in the present study that these transmissions in newborn could be due to vertical transmission. On the other hand, a meta-analysis done by

Amirian et al., included that 23 studies with a sample size of 749 neonates showed that nearly in 15 studies out of 23 studies did not report vertical transmission.¹⁵ Hence, we can conclude that the chances of vertical transmission in COVID-19 could be very less.

The maternal mortality in the present cohort of COVID-19 pregnant mothers was 3 (3.70%). Even though the maternal deaths in the present cohort were three deaths, all the deaths were related to COVID-19 complication and due to COVID-19 pneumoniae. A multinational cohort study done Villar et al.,¹⁶ which involved 43 institutions in 18 countries and compared the outcome of COVID-19 pregnant mothers with non-infected pregnant mothers. This multinational cohort showed that the risk for maternal mortality was higher among the COVID-19 pregnant mothers and it was comparable with the present study.

Limitations of the study

A small sample size of 81 COVID-19-positive pregnant mother could be the limitation of the present study.

CONCLUSION

From the present study, we can conclude that mortality among the pregnant COVID-19 positive mothers was 3.70% and the positivity rate of COVID-19 among the newborn babies was 2.47%. The positivity rate among the newborn babies were low; hence, we can conclude that the possibility of vertical transmission of COVID-19 is low and also future studies are needed to identify factors that can reduce the vertical transmission of COVID-19.

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