



Maternal and Fetal Outcome in Corona Positive Pregnant Women

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Abstract

Background: COVID-19 has shown accelerated rate of spread globally with viral pneumonia as one of the leading causes of pregnancy deaths. Compromised immune status with physiological respiratory alterations predispose pregnant population to worsened outcome with COVID-19 infection.

Aim: Aim of this prospective case study is to evaluate impact of COVID-19 outbreak on maternal and fetal outcome in COVID positive pregnant women.

Material and Methods: This systematic review is a prospective study of maternal and fetal outcome in 60 corona positive pregnant women admitted at AIMS Faridabad in a period of 15 months (March 2020-May 2021). Positive patients were divided into asymptomatic and symptomatic group.

Observation: The study population comprised of 4 women from 20-25 years, 22 women from 26-30 years and 34 women from above 30 years. 30 were primigravida and 30 multi. 21 were asymptomatic, 39 were symptomatic. Out of 39 females, 12 were having mild disease, 16 moderate and 11 had severe to critical disease. Out of 60 cases, 16 continued with pregnancy, 41 cases delivered and 3 had early abortions. There were 3 IUDs and 4 maternal mortalities. LSCS was the common mode of delivery.

Conclusions: In wake of second wave of this epidemic, our study attempts to unravel meaningful factors to deal with symptoms and phenomenon specific to pregnant COVID-19 positive pregnant women to lessen the burden and severity of the disease in this vulnerable population.

Keywords: COVID-19; Pregnant Women; SARS-CoV-2

Abbreviations

IUD: Intrauterine Demise; LSCS: Lower Segment Caesarean Section; ECMO: Extra Corporeal Membrane Oxygenation.

Introduction

COVID-19 is an acute, manageable, immunogenic, thrombogenic, inflammatory contagious novel virus disease. Currently due to severe acute respiratory syndrome coronavirus 2 (SARSCoV-2) has

become a pandemic at a rapid pace with high cases and mortality [1,2]. Most commonly reported infection during pregnancy is viral pneumonia linked to maternal and neonatal morbidity and mortality [3]. Previous literature on impact of 2009 H1N1 influenza virus or Zika virus suggest increase complications and even fatal effects on pregnant women with these infections [4].

Atypical form of pneumonia caused by COVID-19 has been reported to be highly infectious. Certain physiological changes in respiratory tract during pregnancy like decrease in functional residual volume, rise of diaphragm, respiratory tract mucosal edema with cell immunity modifications to tolerate fetal antigens increase susceptibility of pregnant women to certain intracellular

pathogens including bacteria and viruses [5]. Although pregnancy doesn't increase the risk for acquiring COVID-19 infection but appear to worsen the clinical course of the disease compared to non-pregnant of same age group [6].

Materials and Methods

It is a prospective study of maternal and fetal outcome in 60 corona positive pregnant women attending the OBG unit at AIMS Faridabad over a period of 15 months. (March 2020 to May 2021). All pregnant women were confirmed COVID by RT-PCR testing as per ICMR guidelines for contact tracing and testing all suspicious cases. Parameters measured were age, parity, gestational age, symptoms with their severity, blood investigations, X-ray, mode of delivery, apgar score.

Observation

Demographic and clinical characteristics	Frequency	Percentage
Age(years)		
Mean ± SD	31.45 ± 3.8	
Median(25 th -75 th percentile)	31(29-34)	
Range	23-41	
Gravida		
Primi gravida	30	50.00%
Multi gravida	30	50.00%
Period of gestation(weeks)		
Up to 16 weeks	4	6.67%
16+1 to 34 weeks	9	15.00%
>34 weeks	47	78.33%
Mean ± SD	34.4 ± 8.03	
Median(25 th -75 th percentile)	37.5(34.964-38.571)	
Range	4.43-40.57	
Asymptomatic/symptomatic		
Asymptomatic	21	35.00%
Symptomatic	39	65.00%
Severity		
Mild	12	30.77%
Moderate	16	41.03%
Severe to critical	11	28.21%

Table 1: Distribution of demographic and clinical characteristics of study subjects.

Outcome	Frequency	Percentage
Mortality		
No	56	93.33%
Yes	4	6.67%
Maternal outcome		
Delivered	38	63.33%
Pregnancy continued	16	26.67%
Early pregnancy loss	3	5.00%
IUD	3	5.00%
Mode of delivery		
LSCS	39	95.12%
Normal vaginal delivery	2	4.88%

Table 2: Distribution of outcome of study subjects.

Parameters	Survivors	Non-survivors	Total	P value	Odds ratio (95% CI)
Age(years)	31.34 ± 3.9	33 ± 2.71	31.45 ± 3.84	0.408*	1.112(0.869 to 1.423)
Period of gestation(weeks)	37.5(34.964-38.607)	37.29(35.214-37.679)	37.5(34.964-38.571)	0.744†	0.99(0.889 to 1.102)
Gravida					
Primi gravida	30 (100%)	0 (0%)	30 (100%)	0.112‡	1
Multi gravida	26 (86.67%)	4 (13.33%)	30 (100%)		10.358(0.507 to 211.58)
Asymptomatic/symptomatic					
Asymptomatic	21 (100%)	0 (0%)	21 (100%)	0.287‡	1
Symptomatic	35 (89.74%)	4 (10.26%)	39 (100%)		5.451(0.262 to 113.59)
Severity					
Mild	12 (100.00%)	0 (0.00%)	12 (100.00%)	0.004‡	1
Moderate	16 (100.00%)	0 (0.00%)	16 (100.00%)		0.758(0.012 to 47.160)
Severe to critical	7 (63.64%)	4 (36.36%)	11 (100.00%)		14.999(0.620 to 362.591)

Table 3: Association of parameters with mortality.

* Independent t test, † Mann Whitney test, ‡ Fisher’s exact test.

Parameters	LSCS (n = 39)	Normal vaginal delivery (n = 2)	Total	P value	Odds ratio (95% CI)
Age(years)	32.13 ± 3.76	32 ± 1.41	32.12 ± 3.67	0.962*	1.015(0.729 to 1.413)
Period of gestation(weeks)	37.71(37.143-38.857)	39.71(39.714-39.714)	37.71(37.286-38.857)	0.06†	0.328(0.085 to 1.263)
Gravida					
Primi gravida	20 (100%)	0 (0%)	20 (100%)	0.488‡	1
Multi gravida	19 (90.48%)	2 (9.52%)	21 (100%)		0.19(0.008 to 4.551)
Asymptomatic/symptomatic					
Asymptomatic	14 (93.33%)	1 (6.67%)	15 (100%)	1‡	1
Symptomatic	25 (96.15%)	1 (3.85%)	26 (100%)		1.759(0.157 to 19.67)
Severity					
Mild	8 (100.00%)	0 (0.00%)	8 (100.00%)	1‡	1
Moderate	8 (88.89%)	1 (11.11%)	9 (100.00%)		0.333(0.010 to 11.437)
Severe to critical	9 (100.00%)	0 (0.00%)	9 (100.00%)		1.118(0.016 to 79.047)

Table 4: Association of parameters with mode of delivery.

* Independent t test, † Mann Whitney test, ‡ Fisher’s exact test.

Statistical analysis

The presentation of the Categorical variables was done in the form of number and percentage (%). On the other hand, the quantitative data with normal distribution were presented as the means \pm SD and the data with non-normal distribution as median with 25th and 75th percentiles (interquartile range). The data normality was checked by using Kolmogorov-Smirnov test. The cases in which the data was not normal, we used non parametric tests. The following statistical tests were applied for the results:

- The association of the variables which were quantitative and not normally distributed in nature were analysed using Mann-Whitney Test and Independent t test was used for association of normally distributed data with mortality and mode of delivery.
- The association of the variables which were qualitative in nature were analysed using Fisher's exact test as at least one cell had an expected value of less than 5.
- Odds ratio with 95% CI was calculated for mortality and LSCS.

The data entry was done in the Microsoft EXCEL spreadsheet and the final analysis was done with the use of Statistical Package for Social Sciences (SPSS) software, IBM manufacturer, Chicago, USA, ver. 21.0.

For statistical significance, p value of less than 0.05 was considered statistically significant.

Discussion

Patients most commonly present with mild symptoms of infection including fever, cough, fatigue and sore throat, some may be asymptomatic [7] probably explained by younger average age with fewer comorbidities.

In a retrospective review by Liu., *et al.* a comparison of 59 patients including both pregnant and non-pregnant adults was carried out and reported no significant difference between various groups regarding development of clinical features of SARS-CoV-2. However, due to altered immune system pregnant female may experience worsening of symptoms in a very short disease interval. This includes risk of ICU admission, mechanical ventilation, being on ECMO and even death [9].

Shanes., *et al.* found in a study that pregnant women affected with COVID-19, delivering in third trimester were more likely to have placenta with features of maternal vascular malperfusion and intervillous thrombi. These finding suggest abnormal maternal circulation associated with worst perinatal outcome. These changes reflect a systemic inflammatory or hypercoagulable state influencing placental physiology. Shanes., *et al.* noted that increased antenatal surveillance for women with COVID-19 maybe warranted [10].

While many of the preterm deliveries were iatrogenic with reports of fetal distress as an indication and maternal condition worsening, although in others indication of deliveries are unclear [11]. At present, insufficient evidence to determine any correlation between spontaneous preterm labour and COVID-19 infection in pregnancy stands but there are some reported cases of preterm prelabour rupture of membranes [12].

Preferred mode of delivery was LSCS. None of the neonates was infected. LSCS was done mostly on maternal request. Since there is limited evidence about vertical transmission and vaginal shedding of virus, vaginal delivery in a stable patient may be considered. In cases of caesarean section, choice of anesthesia needs a careful consideration [13]. Favre., *et al.* suggested that for every individual patient, vaginal delivery even by induction should be considered. Using instrumental delivery also is preferred to caesarean section to avoid unnecessary surgical complication and maternal exhaustion [14].

Neonates delivered are tested, isolated and cared with droplet and contact preventive measures [15]. While feeding mother wear surgical mask and practice hand hygiene. WHO recommends mothers (asymptomatic and mildly symptomatic) with COVID-19 infection to rooming with their babies [16].

In present there were 4, maternal mortalities out of 11 critical patients, 3 patients were admitted with severe symptoms in ICU, kept worsening even after getting delivered. Fourth patient was already in DIC at time of admission.

Conclusions

With the rapidly evolving outbreak of COVID-19 imposing a threat to public health, attention needs to be given to unique needs of pregnant women with isolation, investigations and close

monitoring even in asymptomatic and mildly symptomatic cases and timely admission in negative pressure isolation unit of confirmed cases to prevent or timely manage unwarranted worsening of symptoms. Monitoring of fetal status, uterine contractions and planning for delivery should be considered with multi-specialty consultation [13].

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