International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622

www.gynaecologyjournal.com
2021; 5(6): 319-323
Received: 22-09-2021
Accepted: 24-10-2021

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Obstetric and perinatal outcome in covid-19 positive pregnant women

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DOI: https://doi.org/ 10.33545/gynae.2021.v5.i6e.1102

Abstract
A Pneumonia of unknown cause was identified in Wuhan, China and was first reported to the WHO Country Office in China on December 31, 2019. On February 11, 2020, WHO announced a name for the new coronavirus disease: COVID-19. Since December 2019, the outbreak of the novel coronavirus disease 2019 (COVID-19) has rapidly spread from China worldwide until to be declared a pandemic. It is a prospective and retrospective observational study conducted in a teaching institute cum District Covid Hospital in North-east Andhra Pradesh, during the time period of May 2021 to June 2021(2nd wave) and June to July, 2020(1st wave). 4 unexplained stillbirths were observed during the second wave. Parameters like gestational age at delivery, preterm birth rate, mode of delivery, birth weight and APGAR scores of newborn are not affected by the covid positive status of the mother. Blood group of the mother has no specific predilection to severity of covid infection.

Keywords: perinatal outcome, covid positive pregnant women

Introduction
A Pneumonia of unknown cause was identified in Wuhan, China and was first reported to the WHO Country Office in China on December 31, 2019 [1]. On February 11, 2020, WHO announced a name for the new coronavirus disease: COVID-19. Since December 2019, the outbreak of the novel coronavirus disease 2019 (COVID-19) has rapidly spread from China worldwide until to be declared a pandemic [2].

With this novel condition, obstetricians and international obstetric bodies sought to determine in a short time the impact of this disease on pregnant women. If parturients were at a higher risk of morbidity and mortality and what effect, if any, this disease would have on the fetus. Leading obstetric organizations have responded with a series of guidance documents to aid clinicians to navigate through this unknown landscape, including guidelines from the International Federation of Gynecology and Obstetrics (FIGO) [3], the Royal College of Obstetricians and Gynecologists, UK (RCOG) [4] and the American College of Obstetricians and Gynecologists (ACOG) [5].

Much of the data available thus far is in the form of case studies, case series and observational studies. COVID-19 is a global public health emergency that has resulted in a significant impact on the mental health of women during pregnancy [6]. Maternal viral infection in pregnancy and the peripartum and postpartum periods can adversely affect infant outcomes. Studies have reported that maternal severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection increases the risk of preterm birth [7].

As such pregnant women are considered to be a high risk group for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, and the potential adverse effects of the virus on maternal and perinatal outcomes are of concern. Pregnant women with covid-19 diagnosed in hospital are less likely to manifest symptoms of fever and myalgia than non-pregnant women of reproductive age and might be at increased risk of admission to an intensive care unit [8].

While, some studies have raised concerns that pregnant women may be more susceptible to COVID-19 as, in general, they may be more vulnerable to respiratory infection. Although there are vulnerable groups within both the pregnant and non pregnant populations, clinicians should be cognizant of these high risk groups and manage them accordingly as per Gillian *et al.* [9]. Pregnant women with pre-existing diabetes have been identified as being more vulnerable to the severe effects of COVID-19 infection as per Alzamora *et al.* [10]. These findings are compared with studies of Chen *et al* [2].

Aims and Objectives

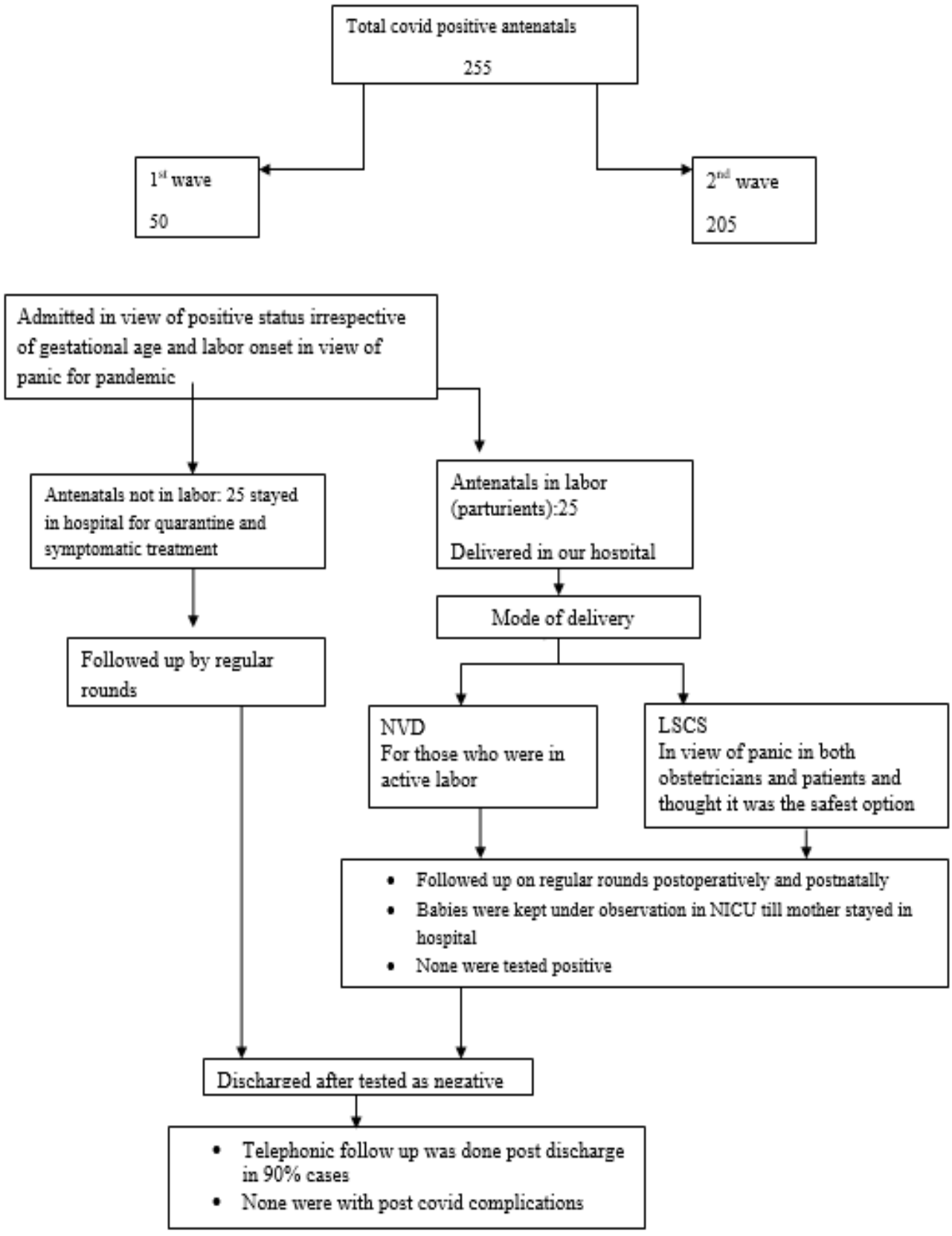
This study was undertaken to determine clinical manifestations, maternal and fetal outcome in pregnant women with corona virus disease and to compare outcomes between first and second wave of covid infection.

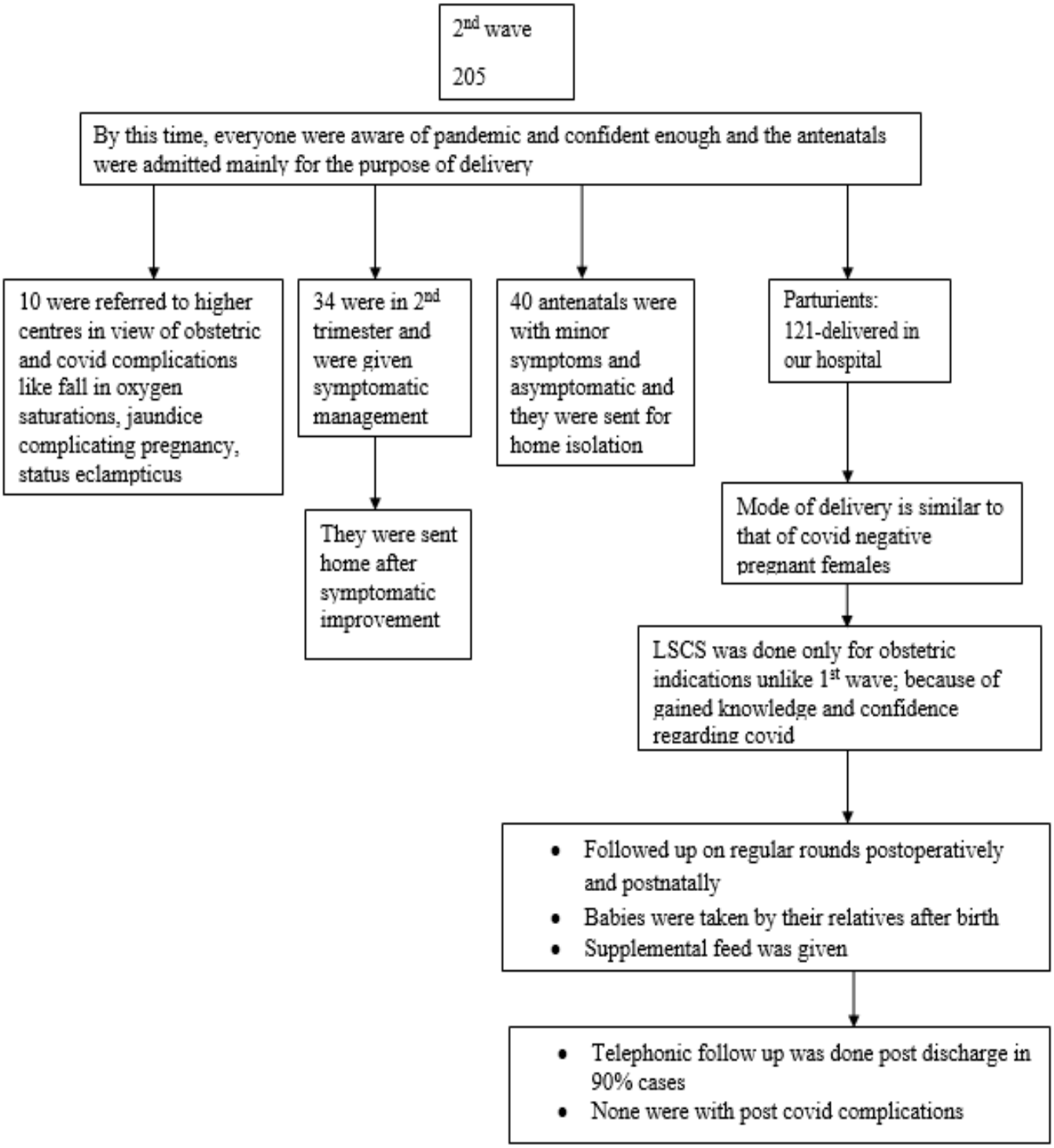
Materials And Methods

It is a prospective and retrospective observational study conducted in a teaching institute cum District Covid Hospital in North-east Andhra Pradesh, during the time period of May 2021 to June 2021(2nd wave) and June to July, 2020(1st wave)

Study Population: 255 cases of covid 19 positive antenatals.195 during 2nd wave and 50 during 1st wave.

Observations





Observations in the parturients were:

Maternal Parameters	2021		2020	
Maternal Age				
<30YRS	119	98.3%	24	96%
≥30YRS	2	1.65%	1	4%
Mean (yrs)	23.5		23.56	
Symptoms				
Asymptomatic	88	72.7%	13	52%
Drycough	10	8.2%	2	8%
Fever	13	10.7%	1	4%
Myalgia	10	8.2%	3	12%
Sorethroat	-	-	6	24%
Blood Grouping And Typing				
O+	46	38%	Couldnot be retrieved	
A+	31	25.6%		

B+	32	26.4%		
AB+	5	4.1%		
O-	4	3.3%		
B-	3	2.4%		
Gestational Age At Delivery				
<37WKS	2	1.65%	2	8%
≥37WKS	119	98.3%	23	92%
Mean GA (weeks)	37.42		38.2	
Mode Of Delivery				
LSCS	48	39.6%	13	52%
NVD	73	60.3%	12	48%
Puerperal Period	-	-	1-pulmonary embolism	

Newborn Parameters	**2021**		**2020**	
Birth Weight				
<2.5KG	10	8.2%	5	20%
≥2.5KG	111	91.7%	20	80%
Mean (kg)	2.84		2.8	
Apgar				
<7	2	1.65%	3	12%
≥7	119	98.3%	22	88%
Rat	Not tested		Reported Negative	
Feeding	Top feeding by relatives		Expressed breast feeding	

Discussion

In our study, among 121 parturients, 2(1.6%) were aged above 30 yrs. Mean age in both the waves was 23.5 yrs and it was 28 yrs as per Mohr sasson *et al* in the meta analysis by Jeong Yee *et al* [11] ,31yrs according to National French survey [12] and 31.5 yrs as per Valerie J *et al*, University of California [13].

In our study, 33(27%) mothers had covid symptoms during antenatal period; 10 (8%) with myalgia, 10(8%) with drycough, 13(10.7%) with fever during second wave. 88(72%) mothers were asymptomatic. During first wave, 12(48%) mothers had covid symptoms during antenatal period; 6(24%) with sorethroat, 3(12%) with myalgia, 2(8%) with drycough, 1(4%) with fever. 13(52%) mothers were asymptomatic. None of them required oxygen therapy or any intervention in both the waves. The pregnant women are more vulnerable to infections due to many physiological alterations. But the severity of COVID 19 disease is milder compared to non pregnant COVID 19 positive patients though pregnancy is a immunocompromised state as per Mehta *et al*. [14].

According to metaanalysis by Jeong Yee *et al* [11], prevalence of fever is 27.6%, Cough 50%, Myalgia 16.3% and other symptoms like dyspnea-20.7%, diarrhea-6.5%, fatigue-54.5%. According to study by Chen *et al*, prevalence of fever was 75%, cough-73%, diarrhea-7% [2].

Preliminary reviews reported high rates of preterm delivery, ranging from 41 to 47%. A systematic review of 33 studies subsequently described the outcomes of 385 pregnant women with COVID-19 with gestational age at birth ranging from 30 to 41 weeks' gestation and a preterm birth rate of 15.2%. While many of the preterm deliveries were iatrogenic and for maternal reasons, there were reports of fetal distress as the indication in some cases, although in others the indication for delivery was unclear. At present, there is insufficient evidence to determine any correlation between spontaneous preterm labor and COVID-19 infection in pregnancy although there are some reported cases of preterm prelabour rupture of membrane as per Elshafeey *et al*. [15].

In our study, mean gestational age at delivery was 37wks 4days in the second wave and 38wks 2days during first wave, it was 38 wks 3 days as per Valerie J *et al*. [13]. We observed preterm birth rate of 1.6% in second wave compared to 2(8%) during first wave. The preterm birth rate in our institute was 3.5% in pre covid deliveries among 605 normal weight newborns [16]. Preterm birth rate was 13.9% as per Valerie J *et al*. [10] and 28.6% as per meta analysis by Jeong Yee *et al*. [11].

In our study, during second wave, 48(39.6%) deliveries were through LSCS and 73(60.4%) delivered vaginally whereas 13 (52%) were LSCS and 12 (48%) were VDs in first wave. The CS rate was 40.8% as per Valerie J *et al*. [13]. Our institute had recorded a CS rate of 56% [16].

There is minimal risk of vertical transmission to the neonate from either mode of delivery.

In our study, during second wave, 2(1.65%) babies were born with 5min APGAR <7; 2 of them required resuscitation. There were 4 stillbirths which was unexplained as they were neither related to severity of covid symptoms in the mother nor had obvious obstetric complications. 3(12%) were born with 5min APGAR <7 during first wave. It was 17.3% babies as per Valerie J *et al*. [13] and 8.8% as per meta analysis by by Jeong Yee *et al*. [11].

In our study, mean birth weight was 2.84 kg in both the waves and it is similar to mean birth weight among pre covid deliveries of our institute [16]. It was 3.2 kg as per Valerie J *et al*. [13] and 2.8 kg as per meta analysis by Jeong Yee *et al*. [11]. Prevalence of LBW(<2.5kg) is 8.2% and 20% during second and first waves respectively compared to 16% in pre covid deliveries in our institute [16].

None of the newborns were tested positive for covid 19 infection during first wave. No routine screening was done for babies during second wave. At present, the data suggests that there is little evidence of vertical transmission to the newborn.

Puerperal period was uneventful except one case during first wave who developed pulmonary embolism postoperatively and referred to higher centre.

Based on the recent epidemiological data on COVID 19, there is no difference in course of disease in pregnant and young adults and management in them depends on obstetric indications; maternal and fetal health status as per Allahbadia *et al*. [17].

Among the blood grouping and typing of the mothers, O+ showed highest positivity rates in this study. According to article by Latz *et al*. [18], blood type is not associated with risk of progression to severe disease requiring intubation or causing

death, nor is associated with higher peak levels of inflammatory markers.

Conclusions

- 4 unexplained stillbirths were observed during the second wave
- Parameters like gestational age at delivery, preterm birth rate, mode of delivery, birth weight and APGAR scores of newborn are not affected by the covid positive status of the mother.
- Blood group of the mother has no specific predilection to severity of covid infection.

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