

# Pregnancy Outcomes and Maternal Complications During the Second Wave of Coronavirus Disease 2019 (COVID-19) in India

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## INTRODUCTION

The second wave of the coronavirus disease 2019 (COVID-19) pandemic is ongoing in India, contributing to a total of more than 25 million cases and nearly 0.3 million deaths as of May 19, 2021.<sup>1</sup> We aimed to evaluate differences in clinical presentation, comorbidities, pregnancy complications, and outcomes in women with COVID-19 during the first and ongoing second wave of the COVID-19 pandemic in India.

## METHODS

We performed a retrospective observational cohort study of pregnant and postpartum women with COVID-19 admitted at BYL Nair Charitable Hospital, a dedicated COVID-19 tertiary care hospital in the Mumbai Metropolitan Region. COVID-19 was diagnosed as per the national testing guidelines.<sup>2</sup> Pregnant women with confirmed COVID-19 who were near-term and those who needed obstetric interventions,

those with high-risk pregnancies, and pregnant and postpartum women (up to 6 weeks) with moderate or severe disease were admitted after screening at a special screening outpatient department<sup>3</sup> during both waves of COVID-19. Pregnancy outcomes and COVID-19 severity were compared between women admitted during the first and second waves of the COVID-19 pandemic in India (Fig. 1). The severity of COVID-19 was categorized as per the Clinical Management Protocol for COVID-19 (in Adults).<sup>4</sup> Univariable comparisons were made using  $\chi^2$ .  $P < .05$  was considered statistically significant. Statistical analysis was performed using SPSS Statistics Base 26.0.

The study was approved by the Ethics Committees of TNMC (No. ECARP/2020/63 dated May 27, 2020) and ICMR-NIRRH (IEC no. D/ICEC/Sci-53/55/2020 dated June 4, 2020). The study is registered with the Clinical Trial Registry of India (Registration no: CTRI/2020/05/025423).

## RESULTS

A total of 1,530 pregnant and postpartum women were admitted as per the admission policy<sup>3</sup> during the first (n=1,143) and second waves (n=387) of the COVID-19 pandemic. The rates of severe COVID-19, admission to the intensive care unit or high dependency unit, case fatality rate, and maternal mortality ratio were higher during the second wave (Table 1). The preterm birth rate and stillbirth rate were not statistically different (Table 1).

The majority of maternal deaths (93%, 28/30) were due to COVID-19 pneumonia and respiratory failure. Descriptive characteristics for maternal deaths are included in Appendix 1, available online at <http://links.lww.com/AOG/C368>. No statistical differences were found in baseline characteristics or clinical

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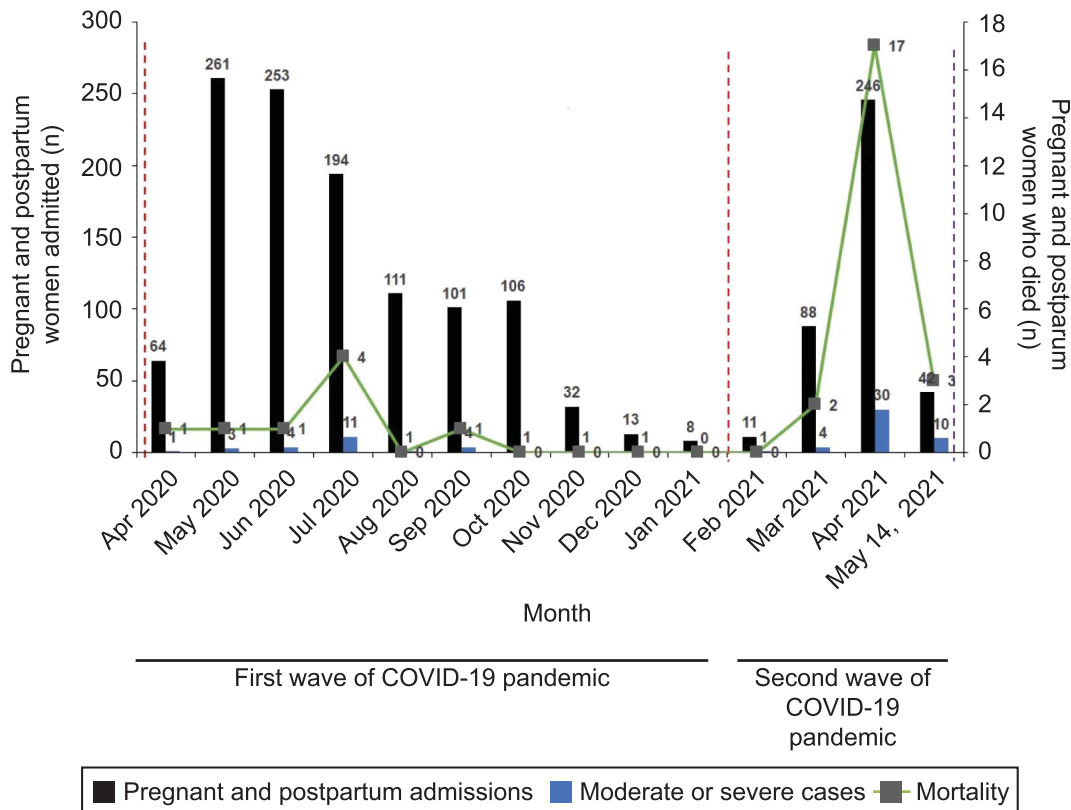
## Financial Disclosure

*The authors did not report any potential conflicts of interest.*

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**Fig. 1.** Timelines of the first and second waves of coronavirus disease 2019 (COVID-19) in India. Mahajan. *Pregnancy and Second Wave of COVID-19. Obstet Gynecol 2021*

**Table 1.** Comparison of Pregnant Women With Coronavirus Disease 2019 (COVID-19) Admitted at BYL Nair Charitable Hospital in Mumbai During the First and Second Waves of the COVID-19 Pandemic in India

Parameter	1st Wave (April 1, 2020–January 31, 2021)	2nd Wave (February 1–May 14, 2021)*	P
Total no. of pregnant and postpartum women treated	1,143	387	—
Case fatality rate	8 (0.7)	22 (5.7)	<.001
Total no. of deliveries	771	256	—
Total births	783	264	—
Vaginal births	466 (60.4)	161 (62.9)	.48
Cesarean births	305 (39.6)	95 (37.1)	
Gestational age at delivery (wk)	39 (38–39)	39 (38–39)	
Preterm birth rate (per 1,000 births)	93.2	128.7	.09
Stillbirth rate (per 1,000 births)	15.3	34.1	.06
Comorbid conditions and pregnancy complications			
Cardiovascular disease†	5 (0.6)	5 (1.9)	.6
Anemia (Hb<11 g/dL)	319 (41.4)	134 (52.3)	.002
GDM	15 (1.9)	6 (2.3)	.69
Gestational hypertension	39 (5.1)	26 (10.2)	.003
Preeclampsia	46 (6.0)	9 (3.5)	.13
Eclampsia	5 (0.6)	1 (0.4)	.63
Oligohydramnios	39 (5.1)	4 (1.6)	.01
COVID-19 severity and outcomes			
ICU or HDU admission	27 (2.4)	45 (11.6)	<.001
Severe COVID-19 cases	19 (1.7)	33 (8.5)‡	<.001
Maternal mortality ratio (per 1,000 births)	10.2	83.3	<.001

COVID-19, coronavirus disease; Hb, Hemoglobin; ICU, intensive care unit; HDU, high dependency unit.

Data are n, n (%), or median (interquartile range) unless otherwise specified.

Chi-square test was applied at a significance level of  $P < .05$ .

\* The second wave of a pandemic is ongoing, and data were analyzed through May 14, 2021.

† Included rheumatic heart disease, peripartum cardiomyopathy, and congenital heart disease.

‡ Of 33 patients with severe disease, two recovered completely, 13 are currently admitted, and four are critically ill.

The severity of COVID-19 disease was categorized as per the Clinical Management Protocol for COVID-19 (in Adults).<sup>4</sup>



presentation between deaths in the first and second waves, possibly due to low sample size.

## DISCUSSION

Our study demonstrates a higher frequency of severe COVID-19, intensive care unit or high dependency unit admission, and maternal deaths during the second wave of the COVID-19 pandemic in India. This is in line with a study from the United Kingdom that reports higher frequency of severe COVID-19<sup>5</sup> but is in contrast to a study reporting low severity of COVID-19 during the second wave in Spain.<sup>6</sup>

Although the exact causes of the increase in severity and mortality are largely unknown, we suspect that a highly virulent variant of concern (B.1.617<sup>7-10</sup>), which is now considered responsible for the second wave in Maharashtra and other parts of India, played a role. However, genome sequencing data to show the direct association of B.1.617 leading to adverse outcomes are not available, so definitive conclusions regarding the effect of the B.1.617 variant cannot be made. In addition, our data are limited to a single center. It is possible that higher case rates and delays in seeking health care are contributors to increased mortality during the second wave of the COVID-19 pandemic. It is, however, unlikely that less severely ill patients presented to other facilities in the region given the declaration of our facility as a dedicated COVID-19 hospital with standardized regional screening processes for admission across both waves of the pandemic. The findings of our study suggest the importance of offering vaccination to pregnant and lactating women during the ongoing COVID-19 pandemic.

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