

Original Article

IMPACT OF COVID 19 PANDEMIC ON MATERNAL HEALTH CARE SERVICES

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ABSTRACT

BACKGROUND: COVID-19 pandemic suddenly attracted focus of entire health care system which leads to disrupted routine maternal health services. Furthermore, lockdown and curfew made scarcity of vehicle for transportation; there was also fear of attending hospital facilities or health stuffs. There are multiple studies indicates drastic decrease at hospital admission and institutional delivery rate and increased maternal mortality and miscarriage. This retrospective study is to find out vaginal delivery, caesarean section, maternal mortality and admission rate changes in pre and post COVID lockdown period in India.

METHODS: *Study Design:* This is a retrospective, observational study of women admitted at Maternity ward of Department of Obstetrics and Gynaecology, COM & JNM Hospital, Kalyani, West Bengal from January 2019 to December 2021 were included in the study. The data was taken and compiled from the admission register and was analysed in terms of vaginal delivery, caesarean section, maternal mortality etc.

Study area: Maternity ward of Obstetrics & Gynaecology Department of, College of Medicine & JNM Hospital, Kalyani.

Study population: All women admitted in the Maternity ward of Obstetrics & Gynaecology, College of Medicine & JNM Hospital, Kalyani.

RESULTS: We can clearly see decline in admission rate after COVID-19 pandemic with reduced vaginal and caesarean section rate. Delivery to admission rate increased during lockdown and post lockdown period indicating people seeking medical attention only when it is unavoidable. We also observed very high maternal mortality rate in lockdown and post lockdown period compared to pre-pandemic time.

CONCLUSION: This study identifies a significant decline in hospital admission, vaginal delivery and caesarean section rate after India was hit by COVID-19. Though this was mediated by multiple factors there is no doubt that mothers experienced either delay or denial of maternal health services during this pandemic.

KEY WORDS: Pandemic, Health care services Surgical termination of pregnancy, Dilatation and evacuation, Contraception.

INTRODUCTION

COVID 19 was first documented in Wuhan, China at the end of 2019, which spread rapidly across the globe. World Health Organization declared COVID-19 as pandemic on 11th March' 2020 and India declared nationwide lockdown on 26th March' 2022.¹ This COVID-19 pandemic suddenly attracted entire focus of health care system which leads to disrupted routine medical services including ante-natal check-up.

Emerging evidence suggests that rates of decreased hospital admission and institutional delivery rate and increased maternal mortality, miscarriage, stillbirth and preterm birth might have changed substantially during the pandemic.^{2, 3} Reductions in health-care-seeking behaviour, as well as reduced provision of maternity services, has been suggested as a possible cause. Furthermore, lockdown and curfew made scarcity of vehicle for transportation; there was also fear of attending hospital facilities or health stuffs.

This retrospective study is to find out vaginal delivery, caesarean section, maternal mortality and admission rate changes in pre and post COVID lockdown period in India.

MATERIALS AND METHODS

Study Type: Retrospective Observational Study

Study design: Longitudinal

Study area: Maternity ward of Obstetrics & Gynaecology Department of, College of Medicine & JNM Hospital, Kalyani.

Study population: All pregnant women admitted in the Maternity ward of Obstetrics & Gynaecology, College of Medicine & JNM Hospital, Kalyani.

Study duration: This study will be conducted for 4 months after getting approval

Preparation	1 month
Data Collection	2 month
Analysis	1 month

Inclusion Criteria:

- I. Only pregnant women were included.
- II. Patient who was admitted in our institute.

Exclusion Criteria:

- I. Women admitted for gynaecology problems.

Intervention: Not Done

Methods: Admission Data was collected from Emergency and Maternity Ward admission register, further patient details were collected from Operation Theatre, Labour room and Discharge register. We collected data from March'2019 to February'2022 and divided this entire 3-year period into 3 parts; From March'19 to Feb'20 is Pre-lockdown period, March'20 to Feb'21 to Lockdown period and March'21 to Feb'22 as post-lockdown period. Data was put on Microsoft Excel 2020 spread sheet and appropriate statistical method was used for analysis.

Data Analysis: For statistical analysis data were entered into a Microsoft excel spread sheet. A chi-squared test (χ^2 test) was used to examine the differences between categorical variables in the same population when the null hypothesis is true. Without other qualification, 'chi-squared test' often is used as short for Pearson's chi-squared test. P-value ≤ 0.05 was considered for statistically significant. If the calculated p-value is below the threshold then the null hypothesis is rejected in favour of the alternative hypothesis.

RESULTS

We found total 32,192 patients admitted in our study period, among them 28,694 patients matched our inclusion criteria. Total 11286 patients were admitted in pre-pandemic 1 year period, after Government of India declared strict lockdown, we observed sharp decline in admission number to 9168 (- 18.76%), which further declined to 8240 in post-pandemic one year (- 26.98%).

During lockdown except month of June we have seen reduction in patient admission in every month, with July (- 30.39%) and August (- 32.77%) month had highest amount of patient admission reduction compared to previous year (Table 1). Only June month had increased rate of admission with 3.92% rise.

	Pre-lockdown	Lockdown		Post-lockdown	
	No	No	% Reduction	No	% Reduction
March	925	751	-18.81	587	-36.54
April	874	748	-14.41	590	-32.49
May	825	663	-19.63	508	-38.42
June	637	662	3.92	528	-17.11
July	997	694	-30.39	649	-34.90
August	1083	728	-32.77	818	-24.46
September	1050	810	-22.85	811	-22.76
October	1075	971	-9.67	850	-20.93
November	1036	936	-9.65	797	-23.06
December	1072	881	-17.81	773	-27.89
January	967	712	-26.37	672	-30.50
February	745	612	-17.85	657	-11.81
Total	11286	9168	-18.76	8240	-26.98

Table 1: Distribution of patient admission according to month during Pre-lockdown, Lockdown, and Post-lockdown period

In post-lockdown period, admission rate was further reduced compared to pre-lockdown time. We found March and May month had respectively 36.54% and 38.42% reduction in patient admission (Fig 1).

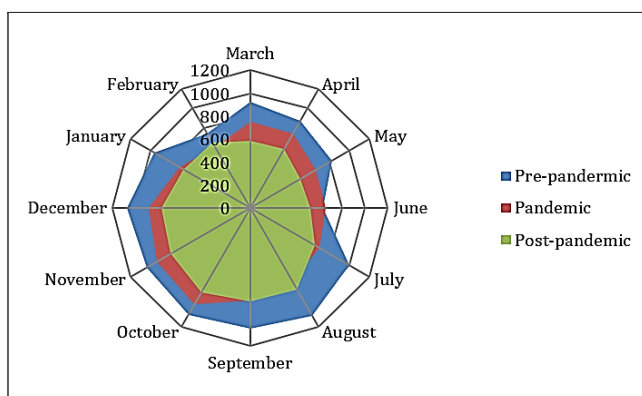


Fig 1: Rader Diagram showing gradual reduction in patient admission according to month

We have observed admission for pregnancy related complications other than delivery requirement declined remarkably. Whereas

before lockdown 67% of total antenatal admission was for delivery, we found sharp rise of that to 75% and 78% in lockdown and post-lockdown respectively. This was also statistically significant in both cases with p value < 0.00001 (Table 2).

	Total Admission	Admission for Delivery	$\chi^2= 25.3$ P < 0.0001
Pre-lockdown	11286	7693	
Lockdown	9168	6953	

	Total Admission	Admission for Delivery	$\chi^2= 35.8$ P < 0.00001
Pre-lockdown	11286	7693	
Post-lockdown	8240	6417	

Table 2: Comparison between Number of total admission and admission for delivery in Pre-lockdown period with Lockdown and Post-lockdown period

We noticed both during lockdown and post-lockdown period with reduction in total delivery number, there is also decline in C-section rate. From 52% during pre-lockdown time, C-section rate reduced to 45% during lockdown period and 44% during post-lockdown time.

	VD	C-Section	$\chi^2= 75.6$ P < 0.0001
Pre-lockdown	3692 (48%)	3981 (52%)	
Lockdown	3846 (55%)	3107 (45%)	

	VD	C-Section	$\chi^2= 92.0$ P < 0.00001
Pre-lockdown	3692 (48%)	3981 (52%)	
Post-lockdown	3608 (56%)	2809 (44%)	

Table 3: Comparison between Vaginal Delivery and C-section in Pre-lockdown period with Lockdown and Post-lockdown period Compared to pre-lockdown period both in case of lockdown (p < 0.00001) and post-lockdown (p <

0.00001) period C-section rate reduced significantly in our study (Table 3).

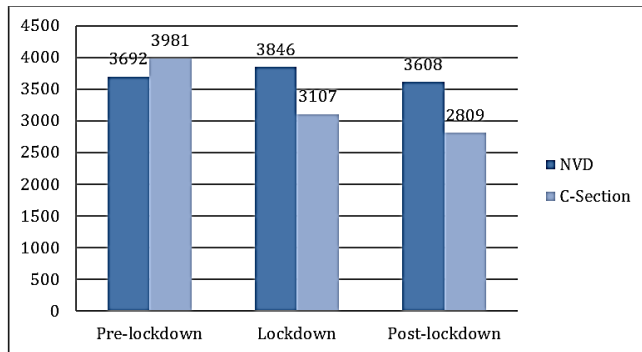


Fig 2: Bar Diagram showing type of delivery during Pre-lockdown, lockdown, and post-lockdown period

During lockdown and post-lockdown period maternal death increased abruptly. Rise of about 84% (n=24) observed in maternal death during lockdown period. Even in post-lockdown period 61% (n=21) higher maternal death was seen compared to pre-lockdown period. We found that rise in maternal death was statistically significant in both lockdown and post-lockdown period with p value 0.014 and 0.021 respectively (Table 3).

	Total Admission	Maternal Death	
Pre-lockdown	11286	13	$\chi^2 = 5.99$ P = 0.014
Lockdown	9168	24	

Pre-lockdown	11286	13	$\chi^2 = 5.32$ P = 0.021
Post-lockdown	8240	21	

Table 3: Comparison between Number of total admission and Maternal Death in Pre-lockdown period with Lockdown and Post-lockdown period

Similar to maternal death, still birth was also high during lockdown (n=257) and post-lockdown (n=231) period. Pre-lockdown period our

Institutional stillbirth rate was 24 per 1000 total births that increased to 37 per 1000 during lockdown period and 36 per 1000 total births during post-lockdown period. Comparing to pre-lockdown period, rise in still birth rate both in lockdown (p <0.00001) and post-lockdown (p <0.00004) period was statistically significant.

	Total Delivery	Still Birth	
Pre-lockdown	7673	184	$\chi^2 = 19.78$ P < 0.00001
Lockdown	6953	257	

Pre-lockdown	7673	184	$\chi^2 = 16.62$ P < 0.00004
Post-lockdown	6417	231	

Table 4: Comparison between Number of total delivery and still birth in Pre-lockdown period with Lockdown and Post-lockdown period

DISCUSSION

We have done a retrospective study by collecting data from March'2019 to February'2022 for a period of 3 years and compiled it to understand the impact of COVID 19 pandemic on maternal health care services.

We have found a clear decline in admission rate during lockdown and also post-lockdown period by 18.76% and 26.98% respectively. Most common reason maybe was anxiety with fear of acquiring infection in the hospital. Similar to our findings *Manzoni E et al* ⁴ reported 35.4% reduction in admission rate. *Kumari V et al* ⁵ also revealed a 43.2% reduction in hospitalization in their institute.

There was drastic reduction in admission for pregnancy related complications other than delivery. Whereas during pre-lockdown period, among all admitted pregnant women only 67% were for delivery, which increased to 75% during lockdown period and 78% during post-lockdown period subsequently. Similar to our study *Manzoni E et al* ⁴ found frequency of admission for

elective caesarean section or labour induction increased from 47.5 % in 2019 to 53.6 % in 2020. We found 4.17% increase in vaginal delivery in lockdown period (n=3846) compared to pre-lockdown (n=3692) period. We found significant increase in vaginal delivery during lockdown and post-lockdown period ($p < 0.0001$), this may be due to delayed referral or unavailability for transport or ambulance services. *Eleje GU et al*⁶ There was a significant decline in C-section rates from 46.8% in the pre-COVID-19 period to 40.0% during the COVID-19 period ($p = 0.027$). On the contrary, *Padhye R et al*⁷ found Caesarian section deliveries in both government (32.8%, n = 19) and private health facilities (86.7%, n = 13) was high. During lockdown period and even in post-lockdown period, there was shift of focus from routine ante-natal services and early picking up of high-risk cases by health care professionals. There was also negative sentiment for attending hospital facility unless extremely necessary takes its toll on overall maternal and foetal wellbeing. We have seen an overwhelming rise of 84% maternal death during lockdown period compared to pre-lockdown 1 year calendar year ($p = 0.014$). Even during post-lockdown 1 year period maternal death was high, that also came statistically significant ($p = 0.021$). *Chmielewska B et al*⁸ identified significant increases in stillbirth (OR 1.28 [95% CI 1.07-1.54]) and maternal death (OR 1.37 [95% CI 1.22-1.53]). Similar to maternal death we also found our institutional still birth rate rises from 24/1000 total birth to 37/1000 ($p < 0.00001$) and 36/1000 ($p < 0.00004$) total births during lockdown and post-lockdown period respectively, both came statistically significant in our study. *Gurung, R et al*⁹ also found that their institutional stillbirth rate increased from 14 per 1000 total births before lockdown to 21 per 1000 total births during lockdown ($p = 0.0002$). Contrary to this *Kugelman N et al*¹⁰ reported that though obstetric emergency events increased, the rates of neonatal and maternal morbidity did not change. For this, though we had seen somewhat increase in vaginal delivery, sharp rise in maternal and neonatal mortality indicates grossly neglected routine health care services.

CONCLUSION

In our retrospective study, we have observed a

clear decline in overall admission rate during lockdown and also post-lockdown period by 18.76% and 26.98% respectively. There was drastic reduction in admission for pregnancy related complications other than delivery. Admission for delivery increased from 67% during pre-lockdown period to 75% during lockdown period and 78% during post-lockdown period subsequently. We have seen an overwhelming rise of 84% maternal death during lockdown period compared to pre-lockdown 1 year calendar year ($p = 0.014$). Even during post-lockdown 1 year period maternal death was high, that also came statistically significant ($p = 0.021$). Similar to maternal death we also found our institutional still birth rate rises from 24/1000 total birth to 37/1000 ($p < 0.00001$) and 36/1000 ($p < 0.00004$) total births during lockdown and post-lockdown period respectively.

During lockdown period and even in post-lockdown period, there was shift of focus from routine ante-natal services and early picking up of high-risk cases by health care professionals. There was also negative sentiment for attending hospital facility unless extremely necessary takes its toll on overall maternal and fetal wellbeing.

LIMITATIONS

In spite of every sincere effort my study has lacunae. The notable short comings of this study are:

1. The study has been done in a single centre.
2. As lockdown was withdrawn in phased manner, defining exact lockdown period could not be done.

The study was carried out in a tertiary care hospital, so hospital bias cannot be ruled out.

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