Original Research Article

Study of Obstetric Emergency Admissions at Labour Room in a tertiary care centre during COVID 19 pandemic

Indrani Dutta[1*], Atima Bharti[2]

[1]Senior Resident, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India
[2]Associate Professor, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India

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Abstract

Background: The above study was done to analyse obstetric emergency admissions during Covid 19 pandemic and to assess its impact over pregnant women coming to seek treatment at our tertiary care centre. **Aims and Objectives:** 1. To analyse and compare obstetric emergency admission at labour room during covid 19 pandemic with pre covid era.2.To analyse behaviour changes of pregnant women in seeking treatment during covid 19 pandemic. **Methodology:** Retrospective study. **Results:** Significant changes noted like increase in mortality, ICU admissions, morbidity load during Covid times as compared to non covid times. **Conclusion:** The government should develop healthcare system to deal with future pandemic. This should ensure availability of ample amount of funds for the continuity of maternity care.

Keywords: emergency, labor room, covid19, pregnant, admission, mortality

Introduction

The Covid 19 pandemic has put a challenge for the obstetrician in terms of management of pregnant female. The country wide lockdown had further aggravated this situation in terms of delayed Antenatal care, delayed referral of patients and poor outcomes. All the more, the fear of contracting Covid 19 infection in pregnant females had a marked impact on their health related behaviours. There has been a substantial difference in obstetric emergency admission, in terms of number of deliveries be it normal vaginal or operative. As per data obstetric emergency admissions are 0.08 to 0.76% of deliveries in developed countries[3-7] and 0.13 to 4.6%[1,8-15] in developing countries during noncovid era. Mortality in obstetric emergencies is 0 to 4.9% in developing[4-7] and 2-43.63% in developing countries[8-11,13,15,16]. Hypertensive disorders and obstetric hemorrhage are the most common indications for obstetric emergency admissions[7]. The other indications are cardiac disease, jaundice, gestational diabetes, sepsis and severe anaemia[7,13,15,18]. The above study was done to analyse obstetric emergency admissions during Covid 19 pandemic and to assess its impact over pregnant women coming to seek treatment at our tertiary care centre.

Aims and Objectives

Primary Objective

1. To analyse obstetric emergency admission at labour room during covid 19 pandemic.

Secondary Objective

1. To compare obstetric emergency admissions during covid 19 pandemic with pre covid era.
2. To analyse behaviour changes of pregnant women in seeking treatment during covid 19 pandemic.

Materials and Methods

Study Design

Retrospective Study.

Study Place

Labour Room, Department of Obstetrics and Gynaecology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand.

Study Duration:

May 2020 to June2021.(Covid 19).[14 months].
January 2019 to February 2020(Non covid era).[14 months].
Data analysis and report writing 1 month.

Rajendra Institute of Medical Sciences is a tertiary care Medical college and Hospital catering to needs of people of entire Jharkhand. Obstetric emergency cases of entire Jharkhand come here for better management. In this study all pregnant and postpartum women coming to our centre in the study duration have been included. Data has been taken from Central admission register and case records have been followed throughout from Medical records department of Rajendra Institute of Medical Sciences, Ranchi .Admitted patients were prioritised and allocated for either labour room management, HDU care or ICU care. We have a three bed ICU , hence for better care of critical patients we transferred them to Critical Care Unit of the Institution. We have recorded all data regarding reasons for Critical care, ICU or HDU admission, ventilatory support needed, blood transfusion given ,ionotropic or dialysis support and surgical procedures performed. Total duration of stay, recovery trajectory, maternal near miss and maternal mortality have been taken from departmental records. Neonatal outcomes have been followed and recorded from Department of Pediatrics of the Institution. Informed Consent has been taken from the Department of Obstetrics and Gynecology while doing this Retrospective study.

Limitations

We have included all Covid 19 negative pregnant and postpartum women in our study as our Institute has separate obstetric services facility running for Covid 19 positive patients.

*Correspondence
Dr. Indrani Dutta
Senior Resident, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India.

Results

Table 1

Age Distribution	Covid era	Non Covid era
<20 years	75	100
20-25 years	420	450
25-30 years	160	180
30-35years	40	60
35-40 years	30	50
>40 years	10	20

Total number of admission in Covid era was 735 and 860 in Non Covid era. Most patients belonged to age group 20-30years, of which both in non covid and covid times maximum admissions belonged to 20-25 years and minimum patients belonging to >40 years.

Table 2: Obstetric history

Gravida	Covid era	Non Covid era
1.Primigravida	290(39.46%)	200(23.25%)
2.Gravida 2	300(40.81%)	350(40.69%)
3.Gravida 3	65(8.8%)	200(23.25%)
4. Multigravida	80(10.88%)	110(12.8%)

Both during Covid and non covid times second gravida patients composed of maximum admissions .However Covid era saw greater percentage of primigravida admissions(39.46%)as compared to Non covidtimes (23.25%), whereas gravida 3 and above(19.16%) had minimum admission during Covid times and preferred to stay away from being admitted.

Table 3: Religion

Religion	Covid era	Non Covid era
Hindu	100(13.6%)	150(17.44%)
Muslim	200(27.2%)	300(34.88%)
Christian	150(20.4%)	160(18.6%)
Sarna	200(27.2%)	150(17.44%)
Others	85(11.56%)	100(11.62%)
Total	735	860

Muslim patients pre dominated both in covid and non covid times.When doing a comparative study we found decreased percentage of people from all religious background both during Covid and non covid times, except for Sarna community which had greater percentage of admission during Covid times.

Table 4: Ethnicity

Ethnicity	Covid era	Non covid era
Tribal	200(27.21%)	500(58.14%)
Non Tribal	535(72.79%)	360(41.86%)

Non tribal patients(72.79%) had higher percentage of admission during Covid times. During non covid times tribal and non tribal patients had little difference in admission percentages.

Table 5: Residence

Address	Covid era	Non Covid era
Rural	300(40.8%)	560(65.12%)
Urban	435(59.18%)	300(34.88%)

During non covid times rural population had higher admission rates as compared to urban, whereas during Covid times urban population had more admission rates.

Table 6: Gestational Age

Gestational Age	Covid era	Non Covid era
1.<24 weeks	35(4.76%)	100(11.62%)
2.24-28 weeks	100(13.6%)	110(12.79%)
3.28-32weeks	50(6.8%)	100(11.62%)
4.32-36weeks	150(20.4%)	250(29.07%)
5.36 weeks till term	400(54.42%)	300(34.88%)

During Covid times maximum admissions were from 36 weeks onwards tilldelivery.(54.42%).Very few patients of early gestational age visited labour room during covid times.(<24 weeks 4.76%,28-32 weeks 6.8%, 24-28 weeks 13.6%).During Non covid times almost equivocal percentages od admission was found between 32-36 weeks(29.07%) and 36 weeks onwards(34.88%).No significant difference was found between admission rates of <24 weeks, 24-28 weeks, and 28-32 weeks which were 11.62%,12.79% and 11.62% respectively.

Table 7: Chief Obstetrical Complain

Chief Complain	Covid	Non Covid
1.TermPregnancy in labour	52(7.07%)	286(33.26%)
2.Preterm delivery	150(20.41%)	200(23.26%)
3.Previous CS with scar tenderness	200(27.21%)	150(17.44%)
4.Bleeding P/V with APH	46(6.26%)	22(2.56%)

5.PPH	30(4.08%)	10(1.16%)
6.Rupture uterus	12(1.63%)	8(0.93%)
7.Non Progress of labor	60(8.16%)	40(4.65%)
8.Fetal Distress	50(6.80%)	28(3.26%)
9.Malpresentation	45(6.12%)	35(4.07%)
10.Obstructed labor	34(4.63%)	25(2.91%)
11.Vulval hematoma	14(1.90%)	10(1.16%)
12.Molar pregnancy	5(0.68%)	6(0.69%)
13.Ectopic pregnancy	17(2.31%)	10(1.16%)
14. Missed Abortion	20(2.72%)	30(3.49%)

During Covid times only 7.07% patients were admitted for spontaneous labour which was very less than non covidtimes (33.26%).No significant difference was found between preterm delivery during covid and non covid times. Significant margin of increase was seen between caesarean rates during covid times(27.21%).Cases of APH, PPH, Rupture uterus, non progress of labour , fetal distress, malpresentation, obstructed labour, ectopic pregnancy showed higher percentages in covid times(6.26%,4.08%,1.63%,8.16%,6.80%,6.12%,4.63%,2.31%) as compared to non covid times(2.56%,1.16%,0.93%,4.65%,3.26%,4.07%,2.91%,1.16%). No significant difference was found between vulval hematoma and molar pregnancy admission percentages during Covid and non covid times. Missed abortion rates were higher during non covidtimes(3.49%) as compared to covid times(2.72%).

Table 8.Medical conditions with pregnancy

Conditions	Covid	Non Covid
1.Heart disease	12(2.73%)	8(3.2%)
2.Jaundice	28(6.38%)	16(6.4%)
3.GDM	15(3.42%)	8(3.2%)
4.Asthma	46(10.48%)	26(10.4%)
5.HIV	12(2.73%)	10(4%)
6.HbsAg	13(2.96%)	8(3.2%)
7. Chronic kidney disease	3(0.68%)	4(1.6%)
8.severe Anaemia	80(18.22%)	60(24%)
9.Puerperal Sepsis	30(6.83%)	10(4%)
10.Hypertensive disorders	200(45.56%)	100(40%)

439 (59.73%) and 250(29.06%) patients with medical conditions in pregnancy got admitted during covid and non covid times respectively. Hypertensive disorders of pregnancy had almost same admission percentages during covid(45.56%) and non covid(40%)(percentages taken from total medical conditions). Jaundice, GDM, asthma, had almost similar proportion, during covid and non covid times. Severe anaemia and puerperal sepsis had greater proportion, whereas heart disease HIV, HBsAg , chronic kidney disease were less during covid times as compared to non covid .

Table 9: Surgical Procedures

Surgical Procedure	Covid	Non Covid
1.Operative delivery		
a.Vaccum	10	40
b.Forceps	20	30
2.caesarean section	435	300
3.caesarean hysterectomy	4	4
4.Relaparotomy	6	0
5.laparotomy		
a.ruptured ectopic	24	20
b.pelvic hematoma	6	
c.septic abortion	18	6
6.Uterine rupture repair	8	4
7.Hysterotomy	12	4
8. Cervical suturing	8	6
9.cervical tear repair	10	6
10.B lynch suturing	10	2
11.Balloon tamponade	20	8
12.ERPC	40	30
13.Molar evacuation	5	6
14.MROP	6	8

Out of 52 term vaginal deliveries, 10(19.23%) were assisted by ventouse and 20(38.46%) by forceps during Covid times. Out of 286 vaginal deliveries during non covid times 40 were by ventouse(13.98%) and 30 by forceps(10.49%). There were 435 caesarean sections(59.18%)during covid times ,whereas it was 300 caesarean sections (34.88%) during non covid times where percentage was taken out of total admissions of the concerned period. There were 12 cases of rupture uterus of which 4 had caesarean hysterectomy and 8 had uterine repair during covid times whereas 4 caesarean hysterectomy and 4 uterine rupture repair was seen during non covid times.6 cases of relaparotomy was present during covid times, whereas none during non covid times. Cases of PPH were managed by either b-lynch or balloon tamponade both during covid and non covidtimes .Cases of rupture ectopic, pelvic hematoma , cervical suturing ,cervical tear repair and septic abortion was more during covid than non covid times.

Table 10: Admission to HDU

Conditions	Covid	Non Covid
1.Postpartum hemorrhage	20	6
2.APE	15	10
3.PPE	15	12
4.Severe ANAEMIA	30	20
5.Heart disease	8	6
6.Shock	12	6
7.Jaundice	8	6

108(14.69%) and 66(7.67%) patients during Covid and non covid times were admitted at HDU units, most common indication being severe anaemia both during Covid and non covid times respectively, heart disease being least common indication.

Table 11: Admission to ICU [Patients requiring ventilatory support]

Conditions	Covid	Non Covid
1.Postpartum hemorrhage	12	4
2.APE	8	6
3.PPE	7	4
4.SEVERE ANAEMIA	10	10
5.Heart disease	4	2
6.Shock	8	4

Admission to ICU ,were 49(6.66%) during covid times and 32(3.72%) during non covid times, indications being due to postpartum hemorrhage, APE, PPE, Severe anaemia, heart disease, and shock during covid (10,8, 7, 12, 4, 8) and non covid times(4,6,4,10,2,4) respectively. Maximum cases of PPH(12) during covid times and severe anaemia(10) during non covid times required ICU admissions.

Table 12: Transfer to Critical Care Unit

Conditions	Covid	Non Covid
1.Dialysis	4	2
2.DIC	6	3
3.Unconscious patient	2	1
4.shock	1	1

13 patients were transferred to critical care unit during Covid times and 7 patients during Non covid times, indication being Dialysis, DIC, Unconscious patient, Shock during covid (4,6,2,1) and non covidtimes(2,3,1,1).

Table 13: Length of ICU stay

Length of stay	Covid	Non Covid
<24 hours	10	20
24hrs-2 days	20	3
2-7 days	5	3
7-10days	10	3
>10 days	4	1

49 patients and 30 patients had ICU stay during Covid and Non covid times respectively. About 20 patients had ICU stay of <24 hours during non covid times, and only 1 had stay of >10 days. Rest patients had stay of 24hrs-2days(3), 2-7 days(3) , 7-10 days(3) respectively. During Covid times 20 patients had ICU stay of 24hours-2days ,10 patients each had stay of <24hours and 7-10days,5 patients of 2-7 days and 4 had stay of >10 days.

Table 14: Maternal mortality

Conditions	Covid	Non Covid
1.hemorrhagic shock	3	2
2.HELLP	8	6
3.Septic shock	5	1
4.Amniotic fluid embolism	2	1
5.Acute pneumonia	3	1
6.Uraemia	5	1
7.Acute pulmonary edema	4	2
8. Congestive cardiac failure	5	3

A total of 35 cases(4.76%) of maternal mortality was seen during Covid time as compared to 17 cases(1.19%) during non covid times. Most cases were due to HELLP both during covid(8) and non covid (6)times, followed by septic shock, uraemia,and congestive cardiac failure during covid times, being 5 cases each respectively. There were 4 and 2 cases of acute pulmonary edema in covid and non covid times respectively. There were 3 and 1 cases of acute pneumonia, 3 and 2 cases of hemorrhagic shock during covid and non covid times.

Discussion

Physiological changes in pregnancy are diverse, so much sothe manifestation of medical conditions are very much different during pregnancy. Obstetrics is one of the most unpredictable branches of medicine .Due to diversity of obstetric medicine and reduced immunity pregnant women deteriorate very rapidly as has been seen during the current Covid 19 pandemic. There has been a noticeable change in the number and diversity of labour room admissions when compared with non covid times. Hence this study was undertaken to compare labour room admissions during covid and non covid times.

Total number of admission in Covid era was 735 and 860 in Non Covid era. Most patients belonged to age group 20-30years, of which both in Non covid and Covid times maximum admissions belonged to 20-25 years and minimum patients belonging to >40 years. There was marked difference between the total number of admissions may be due to fear of contracting covid infection on getting admitted to hospital. Most admissions were antenatal admissions which was in accordance to studies by Yuel VI et al[13],Ashraf N et al[20], also in accordance with studies by Wanderer JP et al[6] and Stevens TA et al[21] which had high admission rate on the day of delivery. This rate was more during non covidtimes(33.26%) compared to covid times(7.07%) which can again be attributed to fear of hospital admission and preferring home delivery or any local set up near to their home. Similar findings are supported by studies conducted by Kimani et al[28] for Nairobi, Kenya that fear of contracting Covid 10 kept many women from attending reproductive health services. Study by Delamou et al[26] and Strong and Schwartz[27] also supported similar findings during Ebola epidemic in Guinea.

Both during Covid and non covid times second gravida patients composed of maximum admissions. However Covid era saw greater percentage of primigravida admissions (39.46%) as compared to Non covid times (23.25%), whereas gravida 3 and above(19.16%) had minimum admission during Covid times and preferred to stay away from being admitted. Primigravida being more anxious about fetal wellbeing preferred opting for hospital admission. Studies by Karkee and Morgan(29) as well as Strong et al(30) also supported that fear of contracting infection prevented many pregnant ladies to come for hospital admission.

Muslim patients pre dominated both in covid and non covid times. When doing a comparative study we found decreased percentage of people from all religious background both during Covid and non covid times, except for Sarna community which had greater percentage of admission during Covid times. Non tribal patients(72.79%) had higher percentage of admission during Covid times. During non covid times tribal and non tribal patients had little difference in admission percentages. During non covid times rural population had higher admission rates as compared to urban, whereas during Covid times urban population had more admission rates. This could be attributed to lack of trained midwifery services during pandemic times which rural mothers usually reached out for during non covid times .This was supported by study by Stephen Okumu Ombere[31] in Kenya were there was lack of services delivered by traditional birth attendant.

During Covid times maximum admissions were from 36 weeks onwards till delivery. (54.42%).Very few patients of early gestational age visited labour room during covid times.(<24 weeks 4.76%,28-32 weeks 6.8%, 24-28 weeks 13.6%).This is further supported by study by Stephen Okumu Ombere. During Non covid times almost equivocal percentages of admission was found between 32-36 weeks(29.07%) and 36 weeks onwards(34.88%).No significant difference was found between admission rates of <24 weeks, 24-28 weeks, and 28-32 weeks which were 11.62%,12.79% and 11.62% respectively. The mean gestational age in other studies ranged from 31-36 weeks[9-11,15]. People preferred hospital based care near term during covid times, which was not the same for non covid times when even early gestation visited hospital without any second thoughts for their pregnancy related queries and demands.

During Covid times only 7.07% patients were admitted for spontaneous labour which was very less than non covidtimes(33.26%).No significant difference was found between preterm delivery during covid and non covid times. Significant margin of increase was seen between caesarean rates during covid times(27.21%) which can be attributed to more concerns about fetal well being and to avoid trial of labour during covid times. .Cases of APH, PPH, Rupture uterus, non progress of labour , fetal distress, mal presentation, obstructed labour, ectopic pregnancy showed higher percentages in covid times (6.26%,4.08%,1.63%,8.16%,6.80%,6.12%,4.63%,2.31%) as compared to non covid times(2.56%,1.16%,0.93%,4.65%,3.26%,4.07%,2.91%,1.16%) which can be attributed to closure of local health facilities during covid times and mismanagement or delayed management leading to greater referral of complicated cases at our tertiary centre.No significant difference was found between vulval hematoma and molar pregnancy admission percentages during Covid and non covid times for which no logic could be understood. Missed abortion rates were higher during non covidtimes(3.49%) as compared to covid times(2.72%), which can again be attributed to increased maternal anxiety and poor or no antenatal and prenatal checkup during covid times. During covid times antenatal services were scarce, hence there was no adequate antenatal early pregnancy check up. This is supported by studies by Iyengar et al[32] and McQuilkin et al[33] which also stressed on compromised health care system during pandemic.

There were 435 caesarean sections(59.18%)during covid times ,whereas it was 300 caesarean sections (34.88%) during non covid times where percentage was taken out of total admissions of the concerned period. Studies by Neto et al[10], Keizer JL et al[4], Zwart et al[5], Ashraf et al[20], showed comparable rates of caesarean section respectively,(75.8%, 50.7%,52.95,67.27%). According to Zwart et al caesarean section is an adjusted risk factor for ICU admission[5].Out of total caesarean sections, 45.98% were due previous caesarean sections during covid times and 50% during non covid times. This was much higher than studies by Zwart et al[5] where it was 14.7% and Neto et al, where it was 35.36%. The other indications of caesarean section were fetal distress, non progress of labour, obstructed labor and mal presentation. Pregnant women in labor during covid times had no access to local health facilities, hence were deprieved to proper intrapartum care.Therefore most of them who reached our centre landed in caesarean section. This is supported by study by Wangamati and Sundby(2020)[34] where pregnant women faced confusion and did not know where to go to seek maternal health services.

439 (59.73%) and 250(29.06%) patients with medical conditions in pregnancy got admitted during covid and non covid times respectively. Hypertensive disorders of pregnancy had almost same admission percentages during covid(45.56%) and non covid(40%)(percentages taken from total medical conditions), which was the commonest indication of admission which is supported by studies by Zeeman et al[2],Keizer JL et al[4],Rios et al[9], Neto et al[10], Bandeira et al(16) The mean range of hypertensive disorders is 7-73.6% from various studies[1-24]. Jaundice, GDM, asthma, had almost similar proportion, during covid and non covid times. Severe anaemia and puerperal sepsis had greater proportion, whereas heart disease, HIV, HBsAg , chronic kidney disease were less during covid times as compared to non covid. Similar facts are supported by Pant et al(2020) who noted that decreased access and utilization of maternal health services had dire consequences for both mother and new born along with risk of nutritional deficiency during country wide lockdown. Without regular antenatal checkup danger signs go unidentified which made them vulnerable to complications related to pregnancy and childbirth. This again well supported in our study where 108(14.69%) and 66(7.67%) patients during Covid and non covid times were admitted at HDU units, most common indication being severe anaemia both during Covid and non covid times respectively, heart disease being least common indication. According to a study by Ashakiran et al[39] 40.39% patients could be managed at HDU.

Admission to ICU ,were 49(6.66%) during covid times and 32(3.72%) during non covid times ,indications being due to postpartum hemorrhage, APE, PPE, Severe anaemia, heart disease, and shock during covid[10,8, 7, 12, 4, 8] and non covid times[4,6,4,10,2,4] respectively. Maximum cases of PPH[12] during covid times and severe anaemia(10) during non covid times required ICU admissions which was inaccordance to study by Ashakiran et al[39] obstetric hemorrhage (44.05%) was the commonest indication requiring ICU admission, followed by hypertensive disorders of pregnancy(28.88%). Some other studies support obstetric hemorrhage as the commonest condition for ICU admission[5,7, 14,

22]. Small MJ et al[18]reported cardiac dysfunction as the commonest indication of obstetric ICU admission[18].Mirghani also reported higher percentage of cardiac disease of ICU admissions[22].Yuel VI et al[13] reports severe anaemia to be risk factor for ICU admission. On comparing Covid and non covid times, HDU and ICUadmissionswere just double during covid times, which can be attributed to lack of proper antenatal and prenatal checkup due to lack of local health facilities which closed due to pandemic.

A total of 35 cases(4.76%) of maternal mortality was seen during Covid time as compared to 17 cases(1.19%) during non covid times. Most cases were due to HELLP both during covid[8](22.86%) and non covid (6)(35.29%)times, followed by septic shock, uraemia, and congestive cardiac failure during covid times, being 5(14.29%) cases each respectively. There were 4(11.43%) and 2(11.76%) cases of acute pulmonary edema in covid and non covid times respectively. There were 3(8.6%) and 1(5.89%) cases of acute pneumonia, 3(8.6%) and 2(11.76%) cases of hemorrhagic shock during covid and non covid times. As per study by Ashakiran et al commonest cause of maternal mortality was hemorrhagic shock (26.89%) and multiorgan dysfunction syndrome(26.05%).The causes of multiorgan dysfunction in this study are HELLP, septic shock and uraemia. Results in our study were different from studies who had higher mortality rates[1, 4-7,9,10,14,16,18,21,22,24]. As per study by Kumar 2020[35] sexual and reproductive health care services are usually neglected during pandemic.Further women being cut from health services threatened sharp rise in maternal and neonatal mortality(Phumapi et al 2020, Pollock et al 2020)[36-37]. As per UN Women (2020)[38] diversion of resources led to increased maternal mortality.

Conclusion

Based on this study finding, it may be said that government should develop healthcare system to deal with future pandemic .This should ensure availability of ample amount of funds for the continuity of maternity care, sufficient number of PPE for health care worker at grassroot level also and integration of midwives at local health facility to provide safe continuity of care.

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