

# Maternal mortality among COVID-19 patients in a tertiary care hospital: A retrospective study

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## Abstract

**Background:** The new covid 19 strains having two mutations is highly infectious and the ongoing disease has posed a huge threat to global public health, causing higher rates of morbidities and mortalities. Keeping this in mind, this study is planned to understand the causes leading to maternal mortality due to covid 19 infection in a tertiary care hospital Mandya Institute of Medical Sciences, Mandya district, Karnataka, India.

**Methods:** A retrospective study was carried out on maternal mortality during the COVID 19 pandemic in MIMS, Mandya, and Karnataka. We collected records of MMR due to covid 19 occurred from the month of June 2020 to July 2021 over a period of one year.

**Results:** MMR from June 2020 to July 2021 is 0.034/lakh live births, majority were of the age group 25 to 35 yrs., majority of the death occurred after 5 days from tested positive, all belonged to moderate or severe category of covid 19 infection. Termination of pregnancy was done in 7 cases i/v/o worsening symptoms, 2 were antenatal deaths, 2 post abortal, 5 deaths were in postoperative period. Most cases were managed on oxygen initially, on Noninvasive ventilation (NIV) and later on intubated. All cases were treated with Thromboprophylaxis, nebulization, steroids, IV antibiotics and Remdesivir was given in four cases.

**Conclusion:** Maternal mortality was more during second wave of pandemic. Maternal mortality was more among moderate and severe disease and nil among mild cases. Unpreparedness among healthcare workers in managing severe cases was among the key determining factors. Better team approach by physicians, intensivists, Obstetricians and infrastructure might be helpful in preventing maternal mortality. Covid vaccination among pregnant women and providing essential drugs and anticipation of worsening symptoms and early intervention might be beneficial in preventing future mortality.

**Keywords:** Maternal mortality, COVID-19 patients, MMR

## Introduction

A pneumonia of unknown cause was identified in Wuhan, China and was first reported to WHO country office in China on December 31, 2019(1). Covid19 registered as the sixth worldwide pandemic on 30 January 2020 by WHO.

Based on clinical manifestations we classify them into mild, moderate and severe disease. Although majority of pregnant who are infected with SARS-COV 2 will be asymptomatic, pregnant women have higher rates of ICU admission compared to non-pregnant and are not at increased risk of death from covid-19 according to the largest systematic review (2). CDC includes pregnant individuals as its increased risk category for severe covid 19 illness.

The new covid 19 strains having two mutations is highly infectious (3) and the ongoing disease has posed a huge threat to global public health, causing higher rates of morbidities and mortalities. Despite 2.5 million infections and 1, 69000 deaths world wide a few maternal deaths and only a few women affected with severe respiratory morbidity.

With the resurgence we are seeing in 2021, symptomatic pregnant women appear to be on the rise and the mortality occurred can never be overlooked. Keeping this in mind this study is planned to understand the causes leading to maternal mortality due to covid 19 infection in a tertiary care hospital -MIMS, Mandya district, Karnataka, India.

## Aims and Objectives

To determine the Maternal Mortality Ratio (MMR) due to covid 19 infection in our hospital.  
To understand the causes leading to maternal mortality due to covid 19 infection in a tertiary care hospital.

## Methodology

A retrospective study was carried out on maternal mortality during the COVID 19 pandemic in MIMS, Mandya, and Karnataka.

All Case records of maternal deaths due to covid 19 occurred over a period of one year (June 2020 to July 2021) was analysed. Case records were analyzed in relation to Age, Parity, clinical symptoms and signs, association of risk factors.

I inflammatory markers, Mode of Delivery.

## Inclusion Criteria

Death of a pregnant lady due to covid 19 infection

Death of a lady within 42days of termination of pregnancy with covid 19 infection.

## Exclusion Criteria

Death of a pregnant lady due to non-covid /accidental/incidental causes.

## Results

Out of 261 Covid-19 positive deliveries, 9 Maternal deaths occurred due to covid 19 infection from June 2020 to July 2021 MMR is 0.034/lakh live births, majority belonged to age group 30 to 35 yrs.



Fig 1: Maternal deaths

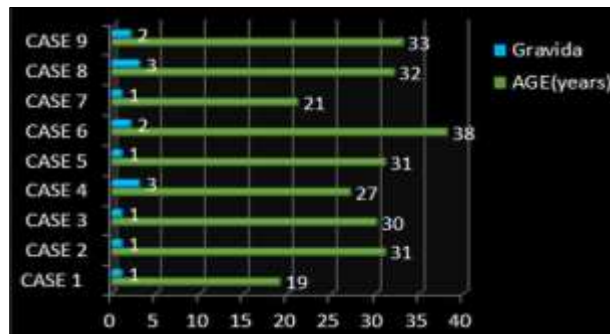


Fig 2: Gravida

Though Majority were severe category of Disease, few mild and moderate cases progressed to severe category

5 deaths were in post less period, 2 were antenatal deaths, and 2 post abortal

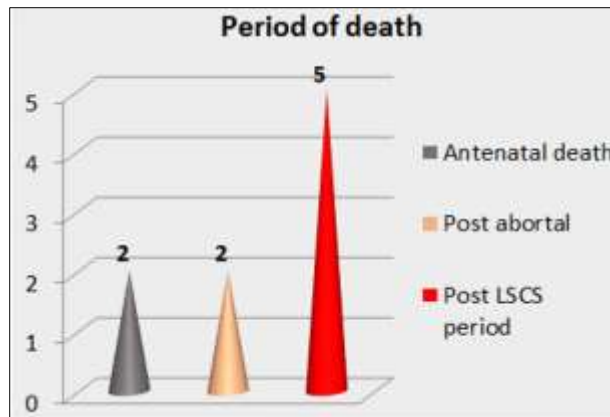


Fig 3: Period of Death

2 Cases associated with severe preeclampsia, one case with RHD, One case with severe Anemia in failure. Though termination of pregnancy was done in 5 cases due to worsening symptoms, prognosis was grave. There was no vertical transmission, no perinatal mortalities

**Discussion**

**Case-1**

Primigravida with 37.5W with twin gestation with severe pre-eclampsia, Risk factors-twin with severe pre-eclampsia.

Presented with complaints of fever for 3 days. At admission her saturation was 98% and termination done at 38+2 weeks by LSCS. In the post-operative period on day 3 her saturation dropped to 88%. Thromboprophylaxis, iv antibiotics was given and she was intubated on day 6 i/v/o worsening of symptoms but death occurred on day 4 of LSCS.

### Case-2

Elderly Primi with 38.6weeks with hypothyroidism, Risk factors –obesity and elderly Primi Presented with complaints of cough since 6 days at admission her saturation was 92%. She was started on antibiotics and oxygen given i//v/o worsening features termination done at 39+2weeks.

On post LSCS day 1 her saturation dropped to 86%, thromboprophylaxis was given was put on ventilator but did not survive, death occurred on day 4 of LSCS.

### Case-3

Primigravida with 33.1week with severe pre-eclampsia.

Risk factor- severe pre-eclampsia.

Asymptomatic at the time of admission, saturation was normal, no respiratory symptoms, suddenly deteriorated her saturation dropped to 66% on day 3, clinically worsened had tachypnea and retractions. LSCS done on day 5 i/v/o worsening of symptoms but didn't improve was put on NIV, later intubated and death occurred on post op day 2.

### Case-4

G-3 P-2 L-1 D-1 WITH 22.5WOG.

Admitted with complaints of breathlessness since 4days. At admission her saturation was 88%, she was put on NIV, IV antibiotics, Remdesivir thromboprophylaxis given but didn't survive death occurred at 23+1W.

### Case-5

G-2 P-1 L-1WITH 18+4 with previous LSCS.

Admitted with complaints of fever and cough since 6days at admission her saturation was 86% and worsened gradually, was put on NIV, IV antibiotics, thromboprophylaxis, remdesivir was given still deteriorated. MTP done on day 5 i/v/o worsening of symptoms but death occurred on post abortal day4.

### Case-6

Primigravida with 19+4 W with RHD.

Risk factor-RHD.

Admitted with complaints of cough and fever since 3days, at admission her saturation was 80%, Oxygen was given, remdesivir, thromboprophylaxis given. MTP done at 19+4WOG but didn't survive. Death occurred on post abortal day 4.

### Case-7

Primigravida with 30+4 W.

Admitted with complaints of fever and breathlessness since 4days. At admission her saturation was 88%. She was put on NRBM, IV antibiotics, remdesivir, thromboprophylaxis

was given. LSCS done at 31+<sup>2</sup> W, but didn't survive, death occurred on day 2 in spite of putting on NIV.

**Case-8**

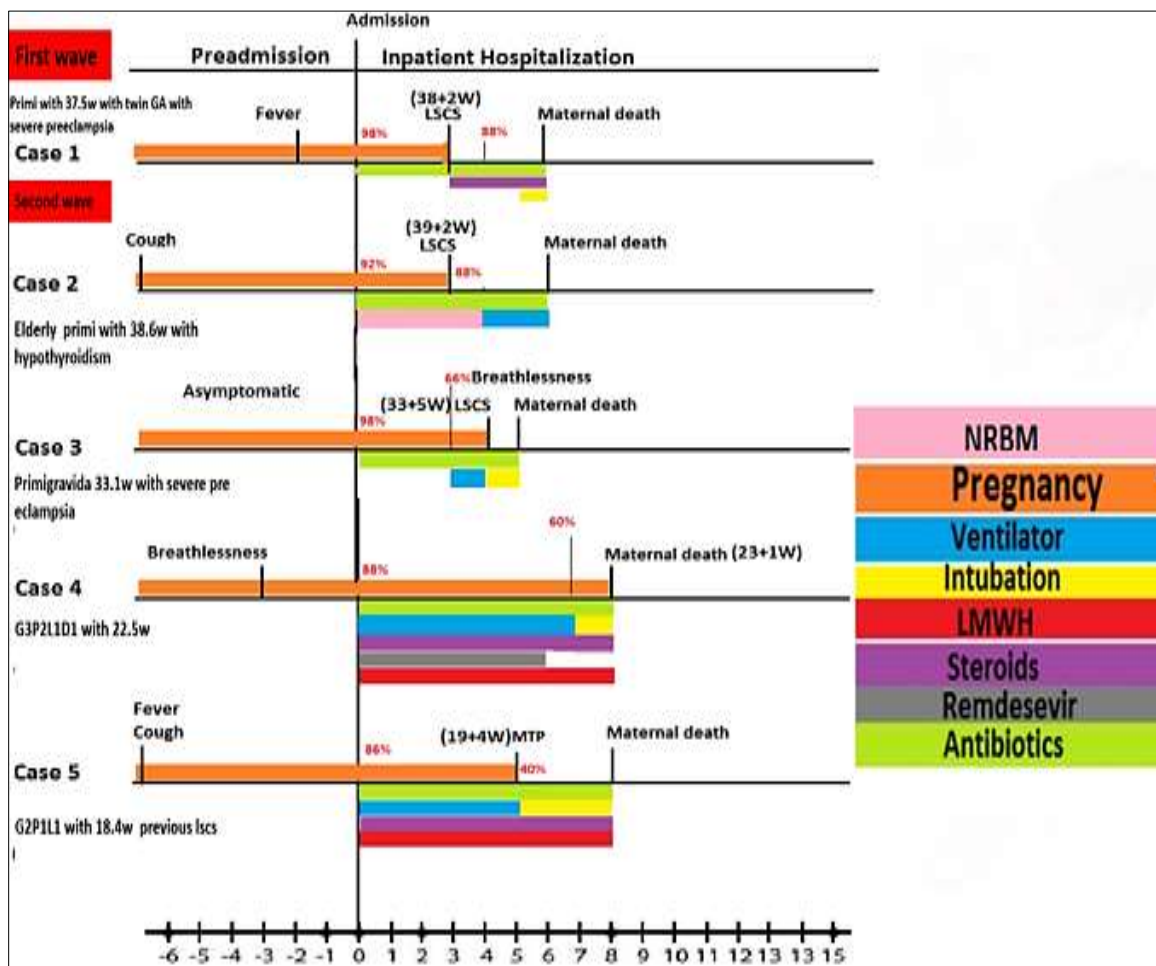
G-2 P-1 L-1 with 11+2 WOG with severe anemia in failure.  
Risk factors-severe anemia in failure.

At admission her BP, pulse not recordable. CPR given, put on ventilator but did not survive, death occurred in spite of all resuscitative measures.

**Case-9**

G-3 P-2 L-2 with 36+5WOG with previous LSCS.

Admitted with complaints of cough since 3 days, at admission her saturation was 96%.IV antibiotics given termination done on day 5,in post LSCS period patient deteriorated, saturation dropped to 89%.post operatively started on NIV, thromboprophylaxis, remdesivir was given, but didn't survive deteriorated clinically, death occurred on post LSCS day 6.



**Fig 4:** Details of cases (A)

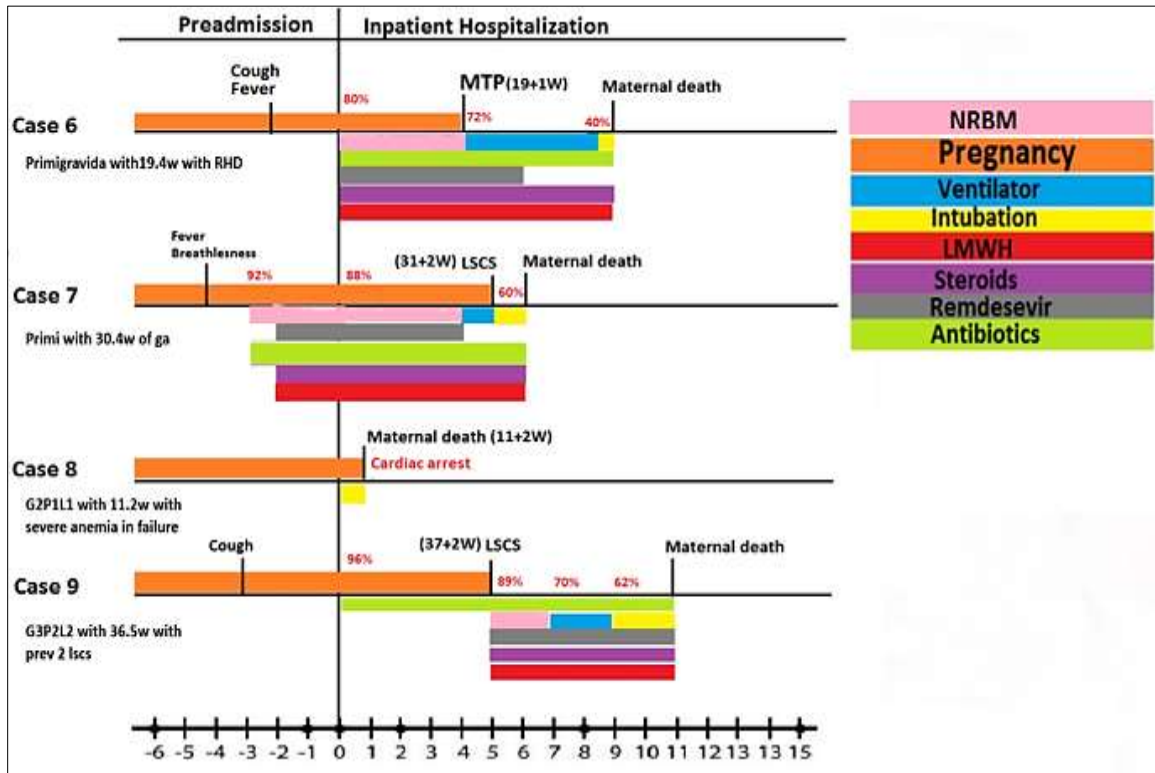


Fig 5: Details of Cases (B)

Table 1: [Inflammatory markers among COVID-19 mortality patients]

Parameter	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
D dimer	369>1600>14500	566>1488>5496	759>1309	623>6576	499>6880	225>6990>12100	926>8556	12500	140>338>11787
Crp	12>15	5.31>5.77>11.9	0.28	3>11	4.7>13	4.2>5.2>10.03	8.54>12.8	20.2	1.32>7.28>20.43
Ldh	308 >202	360>886	388>405	452>617	569>607	748>837>1605	524>684	654	217>430>1394
Ct score	Not done	Not done	Not done	Not done	Not done	21/25	18/25	Not done	13/25
Remdesivir	Not given	Not given	Not given	Given for 6 days	Not given	Given	Given for 6 days	-	Given for 3 days
Steroids	Given	Given for 3 days	Given for 2 days	Given	Given	Given	Given	-	Given for 3 days
Thromboprophylaxis	Given postoperatively	Given for 3 days	Given for 2 days	Given	Given	Given	Given	-	Given for 3days
Gestational age and mode of delivery	38 2/7 LSCS	39 2/7 LSCS	33 5/7 LSCS		MTP at 19.4w	MTP at 19.1w	31 2/7w LSCS		37.3w LSCS
DCDA twin gestation	Yes	No	No				No		No

Birth weight	2.5,2.4kg	3.24kg	1.26				1.5kg		2.3kg
Apgar score at birth	8/10, 8/10	8/10	(VLBW) 7/10				7/10		8/10
Covid positive status	Negative	Negative	Negative				Negative		Negative

Inflammatory markers: D Dimer, LDH, CRP in increasing trend, there were no evidence of vertical transmission, no perinatal mortalities occurred.

### Conclusion

Maternal mortality was more during second wave of pandemic. Maternal mortality was more among moderate and severe disease. Unpreparedness among healthcare workers in managing severe cases was among the key determining factors during second wave. Better team approach by physicians, intensivists, Obstetricians and infrastructure might be helpful in preventing maternal mortality. Covid vaccination among pregnant women and providing essential drugs and anticipation of worsening symptoms and early intervention might be beneficial in preventing future mortality.

### References

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