

Maternal Deaths and Near Miss Obstetrics Events in a Tertiary Care Centre: A Five Year Retrospective Study

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ABSTRACT

Background: Mother is the pillar of family and maternal death is a great loss to new born, family, society and country. Death of a mother during a process of giving birth to a new life is deplorable, especially when it is largely preventable.

Objectives:

- 1) Determine maternal mortality ratio (MMR), maternal near miss incidence ratio (MNM IR), maternal near miss to mortality ratio (MNM:MD) & mortality index (MI).
- 2) Study various demographic factors responsible for maternal mortality.
- 3) Analyse causes of maternal mortality.

Methods: a retrospective study done at a tertiary care centre over a period of 5 years from October 2013 to September 2018. Data collected from case records and maternal death audit registers.

Results: 334 maternal mortality and 2039 maternal near miss events in 5 years with 18236 deliveries. MMR is 1831, MNM IR is 111.8, MNM: MD is 6.1 & MI is 14. Demographic features of maternal mortalities and near miss maternal events were comparable. Hemorrhage and hypertensive disorders were the leading contributors along with sepsis. Anemia indirectly contributed to more than 70% maternal deaths. Higher incidence of maternal mortality ratio is seen in association with rural background, anemia, higher parity and gestational age, unbooked emergency cases and those not accompanied by ASHA.

Conclusion: High maternal mortality ratio can be attributed to it being a tertiary care centre receiving critically ill and moribund patients from peripheries. Near miss maternal events are

>6 times higher, depicting patient load and need of more tertiary care centres.

Keywords: Maternal Mortality Ratio, Maternal Near Miss Incidence Ratio, haemorrhage, anemia, ASHA, unbooked cases

INTRODUCTION

For evaluation of maternal health and services aimed at improving quality of obstetrics care we have relied on enquiries into Maternal death (*as defined by the 9th and 10th revisions of the ICD, is "the death of a woman while pregnant or within 42 days of the end of the pregnancy, irrespective of the duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes"*) and review of cases at very severe end of maternal morbidity spectrum (*termed as near miss maternal event is defined as "a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy"*).^[1] In practical terms, women are considered nearmiss cases when they survive life-threatening conditions (i.e. organ dysfunction). This is a retrospective study into the cases of maternal deaths and near miss maternal events over past 5 years to compare the demographic factors and analyse the causes to improve the health care standards and reduce maternal deaths and morbidity in future.

MATERIALS AND METHODS

The retrospective study was conducted in the tertiary care centre UISE maternity hospital, department of obstetrics and gynecology, GSVM Medical college, Kanpur, Uttar Pradesh over a period of 5 years from October 2013 to September 2018. The data are taken from the maternal deaths record books, central admission and discharge register, severe anemia register, eclampsia register and few more to name. Near miss maternal events were identified by WHO standard tool relying on clinical, laboratory and management-based criteria. Patients characteristics as age, parity, gestation, booked/unbooked, rural/urban, iron folic acid intake, accompanied by ASHA or not and duration of stay in the hospital was recorded.

Statistical methods:

Data thus obtained was entered in Microsoft excel sheet and results are presented in frequencies, percentages and descriptive statistics. The following indices were calculated:

- Maternal mortality ratio (MMR) is number of maternal deaths per 1 lac live births. $MMR = \frac{\text{maternal deaths}}{\text{live births}} \times 100,000$.
- Maternal near miss incidence ratio (MNM IR) refers to the number of maternal near miss cases per 1,000 live births (LB). $MNM\ IR = \frac{MNM}{LB} \times 1000$.
- Maternal near miss: mortality ratio is the proportion between maternal near miss cases and maternal deaths. Higher ratio indicates better care. $MNM : MD$.
- Mortality index (MI): Number of maternal deaths divided by the number of women with life threatening conditions expressed as percentage. The higher the index, more women with the life threatening condition dies (low quality of care), while low index suggests better quality of healthcare. $[MI = \frac{MD}{(MNM+MD)} \times 100]$. [2]

RESULTS

During the 5-year period of this retrospective study 1231`1244y, there were 18236 deliveries, 2039 near miss maternal events and 334 maternal deaths.

Maternal mortality ration (MMR) is 1831.

Maternal near miss incidence ratio (MNM IR) is 11.8

Maternal near-miss mortality ratio (MNM : MD) in this study is 6.1

Mortality index (MI) in this study is 14

Causes for near miss maternal events are similar as those for maternal deaths.

Hemorrhage and sepsis were the most common causes of maternal morbidity and mortality followed by hypertensive disorders. Around 64% females were severely anemic with anemia contributing directly/indirectly to more than 70% of maternal deaths.

Nearly 60% of deaths were in 20-30 years age group females.

93% females had irregular/no intake of iron folic acid tablets.

Only 11% females who died later on were accompanied by ASHA, rest were not.

Only 5% females were booked, rest all maternal mortality females presented to our hospital as unbooked, emergency cases.

Nearly 43% females died within 6 hours of admission to the hospital facility indicating that deaths were largely not preventable due to delayed reporting to the hospital. Out of remaining, majority of females died within 48 hours. 80% females (265 females) required ICU care.

Table no.1

Age (years)	Number of maternal deaths	Percentage (%)
<20	24	6
20-30	200	60
30-40	101	30
>40	9	4

Table no.2

Parity	Numbers	Percentage (%)
G1	121	36
G2/G3	118	35
G4 and more	95	29

Table no.3

Degree of anemia	Numbers	Percentage (%)
Severe (Hb>7g/dl)	212	64
Moderate (Hb7-9g/dl)	92	27
Mild (Hb9-11g/dl)	27	8
No anemia (Hb >11g/dl)	3	1

Table no.4

Gestational age (weeks)	Numbers	Percentage (%)
<20	3	1
20-32	51	15
32-34	97	29
34-37	126	38
>37	57	17

Table no.5

Duration of stay in hospital (hrs)	Number of patients	Percentage (%)
<6	142	43
6-48	118	35
>48	74	22

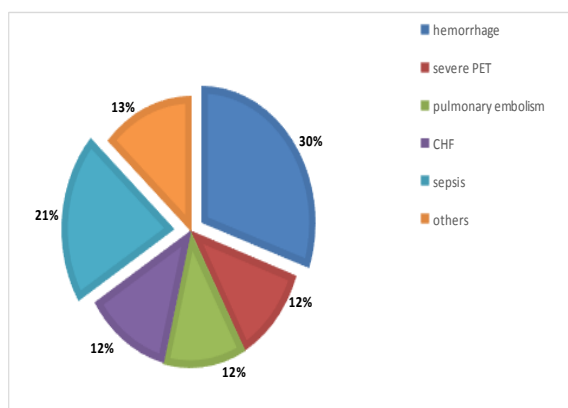


Figure no.1 Causes of death:

DISCUSSION

Maternal mortality is the index of reproductive health of society and reflects the development of a nation as a whole.

Various studies across the nation over past 10 years have reported the MMR of 47 to 600+ per 1 lac live births. Madhu Jain [3] has reported a very high MMR of 2270/100000 live births. This study shows a MMR comparable to the later study, which could be due to the fact that our hospital being a tertiary care centre receives a lot of complicated and moribund patients from nearly 10 surrounding districts, mostly being backward and rural area. KonarH [4] also reported a high MMR of 814 from north zone in their FOGSI study based on institutional data.

As per the UN report for MDGs [5] in the developing countries, only 56 per cent of births in rural areas are attended by skilled health personnel, compared with 87 per cent in urban areas. Only half of pregnant women in the developing regions receive the recommended minimum of four antenatal care visits. In this study only 5%

patients were booked, rest all were unbooked, emergency admissions. More maternal deaths were reported in women from rural areas (60%), unbooked cases and those not accompanied by ASHA/health workers. Our findings are similar to those by Surekha N Khandale. [6]

In this study, maximum maternal deaths were reported in 20-30yr age group (table no.1). Studies by Jadhav AJ, Pal A and Shah RJ [7-9] also depict similar picture.

Haemorrhage and sepsis contributed to more than 50% maternal deaths in this study (figure no.1). In the study by Singla A et al [10] Preeclampsia/Eclampsia was the most common, direct cause of maternal deaths followed by obstetric hemorrhage& puerperal sepsis.

Anemia contributed to more than 70% maternal deaths (224 out of 334 maternal deaths). In more than 91% maternal deaths, females were moderate to severely anemic (table no.1). Anemia was most common indirect cause of maternal deaths in the study by Singla A et al. [10]

As per the study by Sona Singh et al [11] 42.85% of maternal deaths occurred within the first twenty-four hours of admission to the facility which is similar to the results of this study where 43% patients died within 6 hours of reaching hospital i.e. deaths were largely unpreventable due to delay in seeking medical help (table no.5). Out of remaining, majority of females died within 48 hours. 80% females (265 females) required ICU care, but due to limited resources, ICU could be provided only to 33% females (112 females).

In this study, the maternal near miss events are more than 6 times the number of maternal deaths. Causes for maternal near miss events are same as for maternal deaths. In any setting, women who develop severe acute morbidity during pregnancy share many similar pathological and circumstantial factors related to their condition. While some of these women die, a proportion of them narrowly escape death. [12,13] Maternal near miss incidence ratio (MNM IR = MNM/1000LB) in our study it

is 111.8 whereas in study by Anuradha J [14] it is 63.48. Maternal near-miss mortality ratio (MNM : MD) in this study is 6.1 which is similar to study by Anuradha J [14] where it was 6.7. Mortality index (MI) in this study is 14 whereas in study by Anuradha J [14] it is 12.

CONCLUSION

Most of the maternal deaths are due to classical triad of haemorrhage, sepsis and eclampsia, all of which are the preventable causes of maternal deaths provided appropriate treatment is given at periphery and patient is timely referred to higher centre for further management. Educating pregnant females and their families and proper training of community health workers can bring down the MMR effectively. Early detection of high-risk pregnancies and their timely referral to tertiary care centre, promoting institutional deliveries and positioning of skilled manpower at first contact centre can play crucial role in reducing maternal mortality and near miss maternal events. As per the study by VellakalS et al, [15] NRHM [16] resulted in increased uptake of maternal healthcare, and decline in its socioeconomic inequity in high-focus states. Targeting deprived populations and designing public health programs by linking maternal and child healthcare components are critical for events. The ultimate purpose of the near-miss approach is to improve clinical practice and reduce preventable morbidity and mortality through the use of best evidence-based practices.

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