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Original Research Article

Analysis of maternal deaths over a period of three years at a tertiary care centre of Uttarakhand, India

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ABSTRACT

Background: Globally, about 800 women die every day of preventable causes related to pregnancy and childbirth; 20 per cent of these women are from India. The study is aimed at evaluating maternal deaths over a period of three years at a tertiary care centre of Dehradun, India.
Methods: This was a retrospective study conducted in the Department of Obstetrics and Gynecology at SGRRIMHS, Dehradun. The case record files of all maternal deaths from January 2015 to December 2017 was obtained from medical record section of the hospital. Maternal age, parity, educational status, antenatal registration, mode of delivery, admission death interval and causes of each maternal death was noted and analysed statistically.
Results: There were 48 maternal deaths from January 2015 to December 2017.Maximum deaths were in the age group of 21-25 years. The maternal mortality ratio over a period of three years was 671 per one lac live births. Most of the maternal deaths were due to direct causes like hemorrhage , eclampsia followed by sepsis.
Conclusions: Most of the maternal deaths are preventable. High risk cases should be identified at root level and early referral should be the moto. All women need access to antenatal care in pregnancy, skilled care during childbirth, and care and support in the weeks after childbirth. To avoid maternal deaths, unwanted and too-early pregnancies should be avoided. All women, including adolescents, should have access to contraception, safe abortion services to the full extent of the law, and quality post-abortion care. It is particularly important that all births are attended by skilled health professionals, as timely management and treatment can make the difference between life and death for both the mother and the baby.

Keywords: Hemorrhage, Maternal mortality, NRHM (National Rural Health Scheme)

INTRODUCTION

Globally, about 800 women die every day of preventable causes related to pregnancy and childbirth; 20 per cent of these women are from India.[1] According to WHO, a maternal death is defined as death of a woman while pregnant or within 42 days of termination of pregnancy irrespective of the duration and site of pregnancy from any cause related to or aggravated by the pregnancy except accidental or incidental causes.[2] The Maternal Mortality Ratio of India i.e. the number of maternal deaths per 100,000 live births has reduced from 212 in 2007 to 167 in 2013.[3]

Various programmes have been launched by Government of India to prevent maternal deaths. NRHM through its schemes such as the Janani Shishu Suraksha Karyakaram (JSSK) scheme which encompasses free maternity

services for women and children, a nationwide scale-up of emergency referral systems and maternal death audits, and improvements in the governance and management of health services at all levels.[4] NRHM encourages skilled birth attendants for partographic labor and early referral. It empowers skilled birth attendants to administer Mg SO4 for severe eclampsia, oxytocics for active management of third stage of labor and obstetric hemorrhage. India is signatory to millenium declaration as well as sustainable developmental goals and is committed to achieving the target of sustainable development goals of reducing MMR to 70 per one lakh live births by 2030.[5]Government of India is on the right track to reach the goal. It is prudent to accelerate the services to achieve the target.

The present study was conducted to analyse the maternal deaths at a tertiary care hospital of Uttarakhand, India.

METHODS

The study was conducted in the Department of Obstetrics and Gynaecology at SGRRRIMHS, Dehradun after approval from the institutional ethics committee.

The case record files of all maternal deaths i.e. death of a women while pregnant or within 42 days of termination of pregnancy irrespective of the duration and site of pregnancy from January 2015 to December 2017 was collected from medical record section and scrutinized carefully for various aspects like age, parity, literacy, gestational age, educational status, antenatal registration, admission death interval, causes of death and whether the cause of death was preventable or not. Those women who died from accidental and incidental causes were not included in the study.

The data of 48 maternal deaths obtained was carefully studied and analysed.

RESULTS

During the study period of three years, there were fourty eight maternal deaths. The maternal mortality ratio i.e. number of deaths per one lac live births for the year 2015,2016 and 2017 was 852.8, 577 and 587.3 respectively as shown in Table 1.

Table 1: Year wise distribution of maternal mortality.

Year	Maternal deaths	Live births	MMR (Per one lac births)
2015	20	2345	852.8
2016	13	2253	577
2017	15	2554	587.3

47.9% of the deaths occurred in the age range of 21-25 years followed by 25% in the age range of 26-30 years as depicted in Table 2.

Table 2: Age group.

Age group (Years)	Number(Percentage)
<20 years	4 (8.3%)
21-25	23 (47.9%)
26-30	12 (25%)
31-35	91 (8.7%)

There were 16 (33.3%) primigravida and 32 (66.7%) multigravida as shown in Table 3.

Table 3: Parity.

Parity	Number (Percentage)
Primi	16 (33.3%)
Multi	32 (66.7%)

33 patients (68.7%)were unbooked as compared to 15 patients (31.3 %) who were booked as depicted in Table 4.

Table 4: The booking status.

Status	Number (Percentage)
Booked	15 (31.3%)
Unbooked	33 (68.7%)

Table 5 shows that eighteen (37.6%) patients in the present study died after 48 hours, 15 (31.2%)patients died within 24 hours and another 15 (31.2%)patients died within 24-48 hours.

Table 5: Admission -death interval.

Admission-death interval (hours)	Maternal deaths (Percentage)
<24	15 (31.2%)
24-48	15 (31.2%)
48-72	18 (37.6%)

22 (45.8%) deaths were in the postnatal period. 18 (37.5%) patients had normal vaginal delivery whereas six patients (12.5%) had undergone LSCS. There were 24 (50%) live births and eight deliveries (16.6%) of dead baby. 12 (25%) patients were undelivered. Three (6.3%) patients died due to sepsis following induced abortion outside at periphery and one patient (2.1%) died due to ectopic pregnancy (Table 6).

Table 6: Mode of delivery.

Mode of delivery	Number (Percentage)
Normal Vaginal delivery	18 (37.5%)
LSCS	6 (12.5%)
IUD delivery	8 (16.7%)
Septic abortion	3 (6.3%)
Undelivered	12 (25%)
Ectopic pregnancy	1 (2.1%)

In the study period ,28 deaths were due to direct causes. Hemorrhage, (22.9%), eclampsia (14.6%) and sepsis (10.6%) were the major direct causes of death. Rupture uterus, ectopic pregnancy and pulmonary embolism was responsible for 6.2%, 2.1% and 2.1% of cases respectively as shown in Table 7.

Table 7: Direct causes of maternal mortality.

Causes	Number (Percentage)
Hemorrhage	11 (22.9%)
Eclampsia	7 (14.6%)
Sepsis	5 (10.6%)
Ectopic pregnancy	1 (2.1%)
Rupture Uterus	3 (6.2%)
Pulmonary embolism	1 (2.1%)

In the study period, 41.6% of maternal deaths were due to indirect causes. Anemia, jaundice and heart disease accounted for 16.6%, 12.5% and 6.2% of maternal deaths respectively. Dengue, typhoid and swine flu each accounted for 2.1% of maternal deaths (Table 8).

Table 8: Indirect causes of maternal mortality.

Causes	Number (Percentage)
Anemia	8 (16.6%)
Jaundice	6 (12.5%)
Heart disease	3 (6.2%)
Typhoid	1 (2.1%)
Dengue	1 (2.1%)
Swine flu	1 (2.1%)

DISCUSSION

Maternal mortality is a tragic event. The maternal mortality rate for the year 2015, 16 and 17 was 852.8 and 587.3 per one lac live births respectively. Various studies have shown a wide variation in MMR rates ranging from 47 to 625 per one lac live births.[6-9]

The mean mortality rates were significantly higher than other studies because our centre caters to a large number of patients from hilly areas. In the year 2015, we demonstrated even a higher mortality rate because our hospital was a referral centre for patients entitled for free delivery from Government Doon hospital under NRHM. After 2017, it became a Medical College and a referral centre. Hence, fewer mortality was noted in the year 2016 and 2017.

Maximum i.e. 47.9% of maternal deaths were in the age group of 21-25 years. 66.7% of maternal deaths was reported in multigravida and 68.7% of cases were unbooked. In studies by Pal A and Kapadia et al more than 80% of deaths were unbooked. Present findings are consistent with studies by other authors.[9,10] 32 (66.6%) of maternal deaths were in the postpartum period, whereas 12 (25%) of patients were undelivered. Similar findings was seen by Khuamenthem PD and Chanam MS in their study where they noted 70% of maternal deaths in the postpartum period.[11]

It was noted that 31.2% of deaths occurred within first 24 hours, another 31.2% of deaths occurred in another 48 hours and 37.6% of deaths occurred after 48 hours. Present findings are consistent with findings by other authors.[11]

Most of the deaths were due to direct triad of causes like hemorrhage, eclampsia and sepsis similar to studies by Jain, Jadhav and Pal.[7-9] Most of the patients i.e. 22.9% of cases succumb to hemorrhage becoming the most common cause of maternal mortality. Mortality due to placenta accreta was reported in two patients, both had undergone total hysterectomy but subsequently they developed DIC and died. Rupture uterus was responsible for three (6.2%) maternal deaths. Eclampsia and sepsis accounted for 14.6 and 10.6% of the maternal deaths respectively. Three cases had induced abortion outside, one died due to puerperal sepsis and another case had septicemia in the antenatal period. The situation is alarming probably because of antibiotic resistance and late arrivals. Similar findings were noted by Uma Devi S et al.[12]

Most of the patients who died due to eclampsia already arrived late and had untreated hypertension during pregnancy. Hence, early recognization of alarming signs should be done at grass root level. Abortion should be carried out under skilled personals and infection control practices should be followed strictly.

Anemia, jaundice and heart disease were responsible for 16.6%, 12.5% and 6.2% of cases of indirect maternal deaths respectively. Infections due to dengue, typhoid and swine flu was responsible for 2.1% of cases of maternal deaths each. Anemia is a major indirect cause of death responsible for 15-65% of the deaths as reported by various authors. [13-17]Anemia is a preventable disease and measures should be taken to improve nutritional status in pre-conceptional period and antenatal period. Jaundice is the second leading indirect cause of maternal mortality. Hepatitis E is responsible for 8.33% of total maternal deaths. Hepatitis E can lead to fulminant hepatitis during pregnancy and severe maternal morbidity and mortality. Present findings are consistent with findings by other authors.[18]

CONCLUSION

Maternal deaths are not only a health issue but also a matter of social injustice. Many different factors interact in complex ways to increase pregnant women risk of death. Maternal deaths can be prevented by improving health care facilities in rural areas as well as by proper implementation of health programmes. There should be proper pre-conceptional care and counselling. Planned

pregnancies should be encouraged as these are indispensable components in the care of pregnant women.

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