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ORIGINAL RESEARCH

Study of one year cases of maternal mortality at a tertiary hospital

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Abstract

Background: Maternal death is an important indicator for effective health services to poor, and in turn acts as one of the composite measure to assess country's progress. Present study was aimed to study of one-year cases of maternal mortality at our tertiary hospital. **Material and Methods:** Present study was single-center, retrospective, comparative, parallel-group, observational study, conducted from case records of maternal deaths. **Results:** During study period, 9672 deliveries were conducted at our hospital, while 55 maternal deaths were reported. Majority of women were from 21-25 years age group (40 %) & 26-30 years age group (30.91 %). In women admitted in antenatal stage (56.36 %), gravida 4 or more (18.18 %) were most common while in women with Postnatal admission (43.64 %) majority were parity 3 or more (18.18 %). Majority deaths were during postnatal period (63.64 %), as compared to antenatal period (29.09 %) & least were in intranatal period (7.27 %). Majority of deaths were attributed to Direct causes (70.91 %) as compared to Indirect causes (29.09 %). Among direct causes of maternal mortality, common causes were hypertensive disorders of pregnancy (30.91 %), sepsis (23.64 %) & obstetric hemorrhage (16.36 %). Among indirect causes (24.07 %), Cardiac disease in pregnancy (9.09 %), hepatic disorders in pregnancy (5.45 %) were common causes while pulmonary tuberculosis (1.82 %) & malignancy (1.82 %) were fewer common causes. Maternal deaths were observed at >48 hours admission-death interval in majority cases (41.82 %). **Conclusion:** Majority of maternal deaths were preventable by optimum antenatal, intranatal and postnatal services. Recognition of highrisk pregnancy is crucial measure to reduce maternal deaths accompanied by early referral, quick and well equipped transport facilities.

Keywords: maternal deaths, antenatal care, high-risk pregnancy, hemorrhage, maternal mortality

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Introduction

Maternal mortality refers to death from any complications during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, but not from accidental or incidental causes.[1] Despite advances in modern medicine, pregnancy and childbirth remain one of the leading causes of mortality worldwide for women of reproductive age.[2]

Since 2005, India has experienced an impressive 77% reduction in maternal mortality compared to the global average of 43%.[3] The Government of India is a signatory to the United

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Nations (UN) Sustainable Development Goals (SDGs), which adopted a global maternal mortality ratio (MMR) target of fewer than 70 deaths per 100 000 live births by 2030.[4]
Maternal death is an important indicator for effective health services to poor, and in turn acts as one of the composite measure to assess country's progress. Present study was aimed to study of one year cases of maternal mortality at our tertiary hospital, catering large part of population.

Material And Methods

Present study was single-center, retrospective, comparative, parallel-group, observational study, conducted in Department of OBGY, BKL Rural Medical College, Kasarwadi, Post Sawarde, Taluka Chiplun India. Study duration was of 1 year (January 2021 to December 2021). Study approval was obtained from institutional ethical committee.
Case records of maternal deaths[1] occurred in our tertiary hospital, due to direct or indirect causes of termination of pregnancy/ pregnancy related complications during the study period were evaluated. Maternal deaths due to accidental causes or poisoning were excluded from the study.
Records of all maternal deaths during this period were scrutinized for socio-demographic profile, obstetric history, antenatal care history, clinical history (complaints, past medical/surgical history), examination findings, laboratory reports, intrapartum/postpartum details, fetal outcome, period of death (antenatal, intranatal or postnatal), causes of maternal mortality, admission and death interval, condition of patients on admission, outcome of pregnancy, and reasons for delay.
Details of referral status, referral services, details from maternal death audit forms as well as Maternal Death Surveillance & Response (MDSR) reports from institution were studied. Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Statistical analysis was done using descriptive statistics.

Results

During study period, 9672 deliveries were conducted at our hospital, while 55 maternal deaths were reported. Majority of women were from 21-25 years age group (40 %) & 26-30 years age group (30.91 %). In women admitted in antenatal stage (56.36 %), gravida 4 or more (18.18 %) were most common while in women with Postnatal admission (43.64 %) majority were parity 3 or more (18.18 %). Majority of women were residing in rural area (61.82 %). 38.18 % women had 3-4 antenatal visits while only 34.55 % women had >4 antenatal visits.

Table 1: Socio-demographic characteristics

Characteristics	**Maternal deaths (n=55)**	**Percentage**
Age (in years)		
< 20	4	7.27%
21-25	22	40.00%
26-30	17	30.91%
31-35	9	16.36%
36-40	2	3.64%
> 41	1	1.82%
Obstetric status at admission		
Antenatal admission	31	56.36%
Primigravida	5	9.09%
G2	7	12.73%
G3	9	16.36%
G4 or more	10	18.18%

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Postnatal admission	24	43.64%
Para-1	6	10.91%
Para-2	8	14.55%
Para-3 or more	10	18.18%
Residence		
Rural	34	61.82%
Urban	21	38.18%
Antenatal care (ANC visits)		
None	1	1.82%
1-2	14	25.45%
3-4	21	38.18%
> 4	19	34.55%

In present study, majority deaths were during postnatal period (63.64 %), as compared to antenatal period (29.09 %) & least were in intranatal period (7.27 %) In postnatal deaths majority had vaginal delivery (38.18 %) as compared to LSCS (25.45 %) as mode of delivery. In antenatal period, majority deaths observed in third trimester (16.36 %).

Table 2: Period of pregnancy at time of death

Period of pregnancy at time of death	**Maternal deaths (n=55)**	**Percentage**
Antenatal	16	29.09%
First trimester	2	3.64%
Second trimester	5	9.09%
Third trimester	9	16.36%
Intranatal	4	7.27%
Postnatal	35	63.64%
Vaginal delivery	21	38.18%
LSCS	14	25.45%

Majority of deaths were attributed to Direct causes (70.91 %) as compared to Indirect causes (29.09 %). Among direct causes of maternal mortality, common causes were hypertensive disorders of pregnancy (30.91 %), sepsis (23.64 %) & obstetric hemorrhage (16.36 %). Among indirect causes (24.07 %), Cardiac disease in pregnancy (9.09 %), hepatic disorders in pregnancy (5.45 %) were common causes while pulmonary tuberculosis (1.82 %) & malignancy (1.82 %) were fewer common causes.

Table 3: Causes of maternal death.

Causes	**Maternal deaths (n=55)**	**Percentage**
Direct causes	39	70.91%
Hypertensive disorders of pregnancy	17	30.91%
Sepsis	13	23.64%
Obstetric Hemorrhage	9	16.36%
Indirect causes	16	29.09%
Cardiac disease in pregnancy	5	9.09%
Pulmonary embolism	4	7.27%
Hepatic disorders in pregnancy	3	5.45%
Anemia	2	3.64%
Pulmonary tuberculosis	1	1.82%
Others- malignancy	1	1.82%

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In present study, maternal deaths were observed at >48 hours admission-death interval in majority cases (41.82 %), those patients received intensive care & later died due to delayed systemic complications/ sepsis. While patients died within 6 hours admission-death interval (25.45 %) were referred late or were arrived late in our facility.

Table 4: Admission-death interval.

Admission-death interval	Maternal deaths (n=22)	Percentage
Within 1 hour	4	7.27%
1-6 hours	10	18.18%
7-12 hours	4	7.27%
13-24 hours	3	5.45%
25-48 hours	11	20.00%
>48 hours	23	41.82%

Discussion

Maternal mortality is an indicator of the quality of obstetric care in a community, directly reflecting the utilization of healthcare services available.[5] Maternal mortality is an index of reproductive health of the society. High incidence of maternal deaths reflects poor quality of maternal services, late referral and low socioeconomic status of the community.

The causes of maternal mortality can be classified as direct, indirect and coincidental causes. Direct causes are those that are directly related to obstetric complications due to pregnancy, labour or puerperium. The indirect causes are resulting from pre-existing diseases or disease aggravated by the physiological effects of pregnancy.[6,7]

Causes of direct deaths are haemorrhage, sepsis, unsafe abortion, hypertensive disorders, prolonged or obstructed labour and indirect deaths are due to anaemia, malaria, diabetes, cardiac, respiratory, renal, hepatic, metabolic and infectious diseases.[8] Around 80% of maternal deaths are due to direct causes occurring during pregnancy, labor, and puerperium, and 20% are due to indirect causes. The common causes are obstetric hemorrhage, pregnancy-related infection, hypertensive disorders of pregnancy (HDP), unsafe abortion, and obstructed labor.[9]

Agrawal N[10] noted that MMR in the study period was 915/100000 live births. Maximum no. of maternal death 42.7% were in age group of 21-25 years, majority of them residing in urban area. 117 patients referred from sub-district/district hospital. 76.4% patients were registered. 60% maternal deaths were seen in postnatal period. In present study majority of maternal deaths 60% were due to indirect cause while 40% patients died due to direct cause. Major causes of maternal deaths were hypertensive disorder 12%, obstetric haemorrhage 11% tuberculosis 11%, hepatitis E 8% and pregnancy related infections 5.6%.

Sarbhjit K et al.,[11] studied 67 maternal deaths, Maximum (n=51) were between age range of 20-30 years, majority were illiterate (43.28%), belonged to middle and low socio-economic status (98.5%), deaths occurred in the postnatal period (82.1%), occurred at more than 37 weeks period of gestation (49.25%) and 76.12% were due to direct causes. Haemorrhage (n=29) was the most common cause. Anaemia contributed to 16.7% (11) as an indirect cause of maternal death.

Early age at marriage, illiteracy, poor socioeconomic status, and multiparity were found to be important determinants of maternal mortality and can act as risk factors. Delay in seeking care because of unawareness and illiteracy and ignorance was found to be the major contributing factor for most of the maternal deaths.[12] Sandhya VP et al.,[13] studied 100 cases of maternal deaths, 87% belonged to age group of 21 to 30 years. There were 52% deaths in antenatal period. Direct causes were responsible for maternal deaths in 52% cases, indirect causes in 43% cases and in 5% cases the causes were coincidental.

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The Maternal Death Review (MDR) process initiated by Government of India in 2010 attempted to improve the quality of obstetric care and reduce maternal mortality and morbidity by exploring the lacunae in the health system towards the requirements of pregnancy and child birth. Prevention of maternal deaths is one of our foremost goals to provide safety to motherhood and to avoid loss to the family, society, and the nation. Strengthening of the first referral units with equipment, blood bank, and adequately competent staff should be of prime importance. Continued medical education of the medical personnel at the periphery is required. Taking appropriate remedial measures for preventing lapses noted in the management of these cases will be of immense value in reducing the maternal mortality.

Deaths due to haemorrhage, anaemia, obstructed labour, hypertensive disorders and sepsis are surely preventable by upgrading antenatal services, early referral and treatment of high-risk cases, promotion of institutional deliveries and provision of adequate postnatal care.[14] To reduce the maternal mortality, quality of care with skilled birth attendance and appropriate management of complications and disabilities is the need of hour. There is a need for strengthening quality antenatal care, awareness and health education of all pregnant mothers by trainings and orientation workshops for the medical officers and skilled birth attendants, to identify the high risk pregnancies, complications during postpartum period, with timely and prompt referral to minimise the delays and streamlining the referral system with feedback.[15]

Conclusion

Majority of maternal deaths were preventable by optimum antenatal, intranatal and postnatal services. Recognition of highrisk pregnancy is crucial measure to reduce maternal deaths accompanied by early referral, quick and well equipped transport facilities. Public awareness to reduce delay in seeking care and ignorance of pregnant women is important intervention to reduce maternal deaths.

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