Maternal Mortality: A Review from Eastern Nepal

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Aims: This study was done to assess the main causes of maternal mortality and other co-morbid factors contributing to maternal death at a university teaching hospital.

Methods: A retrospective study was carried out in the department of Obstetrics and Gynecology analyzing all case record of maternal deaths from April 2008 to April 2011.

Results: Eclampsia, unsafe abortion, puerperal sepsis, hemorrhages were the leading causes of death. Majority of the patients were unbooked.

Conclusions: Eclampsia, sepsis and hemorrhage were the main causes of maternal deaths. Elderly ages, illiterate status, rural residence, presence of prior medical disease were statistically significant factors contributing to maternal death.

Keywords: eclampsia, maternal mortality rate, unsafe abortion.

INTRODUCTION

Safe pregnancy and child birth is the fundamental rights of every woman but most of them are denied from this right around the world.[1] Everyday thousands of women die from preventable cause related to pregnancy and childbirth, 99% of which occur in developing countries. Mortality is higher in rural areas where the accesses to safe delivery services are poor. Skilled care before, during and after delivery could save the lives of many women and newborn babies. This has been reflected under the millennium development goal (MDG) 5, which aims on reduction of maternal mortality by three quarters worldwide.[2, 3]

The 2006 report of the Nepal demographic health survey (NDHS) was breakthrough news of declining maternal mortality rate (MMR) of Nepal after 45 years of adopting national maternal and child health/ family planning (MCH/FP) services. The impressive stride of country showed MMR of 1500 in 60s to 281 in 2006, for which the United Nations has duly recognized Nepal for earning the prestigious ranking as one of the countries to attain MDG on maternal mortality by 2015.

In spite of such reduction, still the maternal mortality rate is one of the highest in the world. This reduction was achieved with only 20% of deliveries attained by skilled birth attendants. This is a significant achievement for a country, which is undergoing rapid transition in political, health and educational sector in last decade. Though there is decline in national average of MMR, wide disparity between regions persists viz. 153 in Sunsari and 301 in Jumla. Analyzing the causes of death, patterns of morbidities, groups affected and the health system failure is important for further reduction in maternal death rate and redesigning the long-term health policies.

METHODS

A retrospective analysis of all maternal deaths from April 2008 to April 2011 at BP koirala Institute Of Health Sciences was conducted with the objective to identify the main causes of deaths and associated factors responsible for it. Data were extracted from case records of the hospital after clearance from institutional ethical review board. The records were studied with relation to patient's age, parity, socioeconomic status, mode of delivery, presence of medical conditions prior to pregnancy, place of the

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primary treatment (primary health centre, hospital), type of treatment and cause of death. The data were entered into excel sheet and analysis was done using SPSS-version -12. Chi-square test was used as the statistical test of significance.

RESULTS

Total 27,666 obstetric admissions and 20,082 live births occurred in the study period, out of which 56 maternal deaths were identified and detailed analysis was performed. Maximum number of deaths was found between 15-35 years age group with the youngest being 16 year and eldest 50 year. Majority were unbooked patients, mostly illiterates, 43.5% had not attained even a single antenatal visit at any place, among them 41 were from terai and 15 from hilly district. Majority (55) was housewives, only one was nurse by occupation (Table 1).

Table 1. Demographic characteristics of the population (n=56).

Characteristics	Number (%)
Age ≤20 years	12 (21.4)
21-34 years	39 (69.1)
≥35 years	5 (8.9)
Booked	3 (5.4)
Unbooked	53 (94.6)
Primi	23 (41)
G2 – G4	13 (23)
≥G5	20 (35)
Rural	47 (83.2)
Urban	9 (16.1)
No prior single ANC	24 (43.5)
>1 ANC	32 (56)
Never gone to school	41 (73)
< 10 grade	8 (14)
≥12	7 (12)

Considering the management prior to reaching us, 42 patients were found to have some form of treatment at the primary centre, out of which 24 patients had trial of labour at the previous centre. Among the 19 patients referred with history of seizures only three patients had received loading dose of magnesium sulphate, one had received diazepam. Six were referred following complications after cesarean section, four after vaginal delivery, one after instrumental delivery, and four after induced abortion. Only 14 patients arrived directly from home to the tertiary centre.

The period of gestation at death showed that 31(55%) were antenatal admissions of which six were less then 12 weeks, six were of 12-28 weeks, 19 were more than 28 weeks and 25(44.7%) postnatal admissions. Time of hospital arrival after onset of symptoms shows 24(42%) arrived within less than 24 hour, 25(44%) arrived within 24-48 hours, six patient arrived after seven days of symptoms and only one arrived after a month.

During admission 15 (26%) were in state of shock and 50 (89%) had no known medical condition prior to pregnancy while three had rheumatic heart disease, one each had received treatment for choriocarcinoma, systemic sclerosis, seizure disorder, 66% of the patients needed direct intensive care unit (ICU) at admission, another 18 were initially admitted to ward and later shifted to ICU when condition deteriorated, one patient expired in admission room immediately on arrival. During ICU stay 45 needed ventilator supports either continued for post-operative care or for low oxygen saturation, 34 required inotropic support, and 22 needed blood transfusions.

After reaching our centre 41(73%) were conservatively managed, 15 patients required surgical management among which six needed cesarean hysterectomy, three required cesarean section, one needed molar evacuation, five required laparotomy for pyoperitoneum following septic abortions or puerperal sepsis.

Regarding the route of delivery three mothers expired with fetus in utero, eight had undergone cesarean section, 19 had spontaneous vaginal delivery and five instrumental delivery. Only 14 neonates were alive at birth. Duration of hospital stay before death was less than 24 hours 42%, 24 hours to seven days in 55%, and more than seven days in 2%, with the longest stay being 14 days.

Major causes of death observed were complications of hypertensive diseases and sepsis secondary to unsafe abortion or puerperal sepsis (Table 2).

Table 2. Causes of maternal deaths (n=56).

Causes	Number (%)
Eclampsia	19 (33)
Puerperal sepsis	11 (19.6)
Unsafe abortion	5 (8.9)
Post partum hemorrhage	8 (14.1)
Pregnancy with heart disease	3 (5.3)
Miscellaneous	4 (7.1)
Molar embolism	1
Acute fatty liver of pregnancy	1
Ruptured ectopic	1
Suspected cerebrovascular accidents / thrombosis	1

It was seen that educational status, age, residence, rural or urban, presence of prior medical condition were significant variables with P value < 0.05 while factors such as parity, time of hospital arrival after onset of symptoms, surgery or conservative management, mode of delivery were not statistically significant variables (Table 3).

Table 3. Categorical comparison of variables among unbooked and booked patients (n=56).

Variable	Category	Booked	Unbooked	P-value
Age (years)	Illiterate	0	41	
	Literate	4	11	0.002*
	<20	-	6	
	20-34	2	42	0.001*
	>34	2	4	
Parity	Primi	-	24	
	G2-G4	3	20	0.693
	>G5	1	8	
Area of residence	Rural	1	45	
	Urban	2	8	0.005*
Hospital arrival time	< 24 hrs	1	26	
	>24 hrs	2	27	0.574
Management	Surgical	1	11	
	Conservative	2	42	0.619
Prior medical disease	None	2	46	
	Present	3	5	0.004*
Delivery route	Cesarean	0	13	
	Vaginal	3	40	0.379

* Significant

DISCUSSION

Global estimates of causes of maternal mortality revealed hemorrhage, hypertensive disorder, unsafe abortions, and sepsis in decreasing order of frequency.[4] But in this study hypertensive disorder complicating pregnancy was found to be the number one cause. The decreasing trend in hemorrhage related deaths could be attributed to wider availability of sonography for earlier detection of placenta praevia and timely intervention and availability of blood transfusion services. Eclampsia has been reported as number one killer in terms of maternal mortality in recent years in various studies, which is in accordance with the result of our study.[13-15]

Deaths related to unsafe abortion have been on decline in the recent years. [16, 17] But, in this study, 19 % of deaths were attributed to abortion. Similar results were seen in analysis of unsafe abortion related deaths done few years back in this centre.[18] Even in the post legalization era, unsafe abortion has been major cause of maternal mortality. Out of 11 patients of unsafe abortion, six required laparotomy for repair of uterine perforation, pyoperitoneum, and bowel and bladder injury. One patient expired due to hypovolemia secondary to ruptured ectopic pregnancy.

Clark's et.al reported 15% of maternal deaths to be associated with pre-existing medical conditions which is similar to our series with 11% [7]. Most maternal deaths occur in pregnancies, which were considered to be low risk to start with. As reported by Abou-Zahr et.al, 24% of maternal deaths occur during antenatal period, 16% during labor, and 60% in the post partum period.[11]A study by Berg et al[8] showed a progressive increase in death as pregnancy advances which is in accordance with our series of 77% of deaths beyond 28 weeks and in the puerperium. This finding supports the importance of increased frequency of antenatal visits as pregnancy advances from the standpoint of maternal health.[9]

The risk of death caused by cesarean operation is approximately 2/100,000 live births.[5]In our series, eight patients had undergone cesarean delivery out of which two needed re-laparotomy for internal hemorrhage. So the cesarean section attributed mortality was much higher in our series. Sorina et.al reported that an immediate availability of an ICU in case of obstetrical emergencies reduced mortality by more than 20%.[12] However in our study ICU care was available for most of the patients immediately.

Thompson identified poverty, political instability, and limited education as links to high magnitude of this problem which is in accordance to the results of our study showing high number of deaths in resident of rural areas, unbooked patients, illiterates.[10] But other factors such as lack of access to health services due to lack of finance, transport could have contributed additionally in our scenario.

This data is a hospital record only, the scenario could be different for those who deliver at home and most deaths at home and outside health facility are still not reported. We need a surveillance system to look in to it.

CONCLUSIONS

The results of the study have been an eye opener for all of us. Though many advocacy measures have been done on antenatal care, the hypertensive disorders related mortality is still rife. Deaths secondary to unsafe abortion also marks a black spot on our strategy, as there has been no significant reduction on maternal deaths despite legalization of abortion. Though all deaths cannot be prevented our continued commitment, action and perseverance will help lower the mortality rate.

DISCLOSURE

The authors report no conflicts of interest in this work.

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