

Socio-demographic Characteristics and the Three Delays of Maternal Mortality

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ABSTRACT

Objective: To describe the socio-demographic characteristics and the three delays of maternal mortality in a tertiary teaching hospital.

Study Design: Retrospective, observational study.

Place and Duration of Study: Department of Obstetrics and Gynaecology, Unit III, Civil Hospital, Karachi, from April 2005 to May 2008.

Methodology: One hundred and four consecutive maternal deaths were reviewed. Data regarding age, parity, socio-demographic characteristics, booking status, referral source, cause of death and the three delays was collected on structured proformas, analyzed by the statistical software, SPSS version 13, and presented in the form of frequencies and percentages.

Results: The projected maternal mortality ratio was 1650/100,000 live births. The mean age was 28±6.2 years and median parity was two. Seventy-one women (68%) were uneducated, 65 (62.5%) belonged to lower socioeconomic class and 60 (58%) had received no antenatal care. Ninety-eight women (94%) had one or more delays, with 70 (71%) having the first delay, 73 (74%) having the second delay and 47 (48%) the third delay. The most frequent reasons for first, second and third delays were lack of awareness in 88.5% women, long distance in 39.7% women and difficulty in getting blood in 49% women respectively.

Conclusion: The very high maternal mortality ratio suggests lack of access of women to quality healthcare facilities. A majority of these women suffered first and second delays in their management, which could be due to their poor socio-demographic factors.

Key words: Maternal mortality. Socio-demographic characteristics. Delays.

INTRODUCTION

Maternal mortality is a sensitive indicator of the status of women, access to care, adequacy and quality of healthcare in developing countries.¹ Over half a million women die each year due to pregnancy complications, the vast majority of which are preventable.² In developing countries, one woman dies in 16, compared to one in 2800 in the developed countries.³

Pakistan has a maternal mortality ratio of 320 per 100,000 live births.⁴ Nearly two-thirds of maternal deaths worldwide are due to five direct causes namely hemorrhage, obstructed labour, eclampsia (pregnancy-induced hypertension), sepsis and complications of unsafe abortion.⁵ However, these causes do not usually result in maternal deaths in developed countries. Therefore, other factors like delay in receiving timely and appropriate care in the event of a pregnancy complication have been put forward as a major determinant in maternal mortality.

According to Thaddeus and Maine, delay can occur at three different levels: (1) delay in decision to seek care, (2) delay in reaching the appropriate facility and (3) delay in receiving adequate care in the facility.⁶ The reasons for the first delay may be late recognition of the problem, fear of the hospital or the costs or lack of an available decision maker. The second delay is usually caused by difficulty in transport and the third delay is often due to difficulty in getting blood supplies, equipment and operation theatre.⁵ Low socio-economic status of women, illiteracy and residing in the rural areas may be the main factors responsible for delays in receiving care during delivery.⁵

This study describes the various socio-demographic characteristics and the three delays of maternal mortality in a public-sector tertiary teaching hospital.

METHODOLOGY

This retrospective, observational study was undertaken in the Department of Obstetrics and Gynaecology Unit III, Civil Hospital, Karachi (CHK), from April 2005 to May 2008. CHK is a large tertiary teaching hospital, which serves as a referral centre for all the health facilities of Karachi and its suburbs as well as the adjoining areas of rural Sindh (Thatta) and Balochistan. Majority of the

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Received July 29, 2008; accepted November 25, 2008.

women admitted to the labour room are emergency cases referred by various public or private hospitals, in a critical condition.

All women who suffered a maternal death during this period were included in the study. A structured proforma was used to collect the relevant information by means of both interviewing the relatives of the deceased women as well as from the patients' case files. Data was collected regarding age, parity, socio-demographic characteristics, booking status, referral source, cause of death and the three delays.

Booked patients were defined as those who were registered at CHK outpatient department in any of the three units of the Department of Obstetrics and Gynaecology. Maternal death was defined according to ICD-10⁷ and cause of death was allocated on the basis of consensus diagnosis arrived at, in the departmental monthly maternal mortality audit meetings. Delay was defined as by Thaddeus and Maine.⁶ Information regarding the first and second delay was obtained from interviews with patients' attendants whereas that regarding the third delay was taken from the case files. The delay in referral from various health facilities and multiple referrals were included in the second delay.

The data was analyzed by computer software, SPSS version 13, and results presented as frequencies and percentages.

RESULTS

During the study period, there were 6952 deliveries, 6302 live births and 104 maternal deaths giving a maternal mortality ratio of 1650 per 100,000 live births. Only 4 women (3.8%) were booked in CHK. Seventy-eight women (75%) were referred, 43 (55%) from private hospitals, 26 (33%) from public hospitals, 7 (9%) from maternity homes and 2 (2.5%) directly from Traditional Birth Attendants (TBAs). Most of the patients referred from private or public hospitals were initially referred to them by TBAs or primary healthcare centres. The mean

age of women was 28±6.2 years and median parity was 2 (ranging from 0-11). The mean hemoglobin concentration was 7.9±2.8 gm/dl. Hemoglobin concentration was not done for 24 women who were either brought dead or died within a few hours of admission. The median time interval between admission and death was 21 hours (ranging from 0 to 552 hours). Fifty-three women died within 24 hours of admission; of those, 10 were dead on arrival and 14 died within two hours.

Sixty-eight percent of the women had received no formal education and 86 (82.7%) belonged to a lower socio-economic class with monthly income less than Pak Rs. 10,000/= . Fifty-eight percent of the women received no antenatal care whatsoever throughout the index pregnancy.

Direct causes were responsible for 70 percent of maternal deaths, the three most frequent being hemorrhage, hypertensive disorders and unsafe abortion in 29%, 15% and 10% cases respectively. Seventeen percent of deaths were due to indirect causes, the most frequent of which was hepatic encephalopathy (11.5%). There were 3 accidental deaths and the cause was unknown for 10 women (Table I).

Table II shows the reasons for the three delays of maternal mortality. One or more delays were present in 98 (94%) women and second delay was the most frequent, present in 73 (74%) women. The first delay was found in 70 (71%) women and the third delay in 47 (48%) women.

DISCUSSION

The projected maternal mortality ratio (1650/100,000 live births) was markedly higher compared to that previously reported from the same Unit (937 per 100,000 live births) for the years 2002-2004. One plausible reason for this discrepancy could be improved reporting as earlier, patients transferred to other

Table I: Causes of maternal deaths. Values are expressed as n (%).^x.

Direct		Indirect		Accidental	
Hemorrhage	30 (29)	Hepatic encephalopathy	12 (11.5)	Burns	2 (1.9)
Hypertensive disorders	16 (15.3)	Anemic heart failure	3 (2.8)	Cerebral malaria	1 (0.9)
Unsafe abortion	10 (9.6)	Congenital heart disease	1 (0.9)		
Puerperal sepsis	7 (6.7)	Epilepsy	1 (0.9)		
Obstructed labour	4 (3.8)	Ca breast	1 (0.9)		
Ruptured uterus	4 (3.8)				
Hyperemesis	1 (0.9)				
Chorioamnionitis	1 (0.9)				

^x Cause was unknown in 10 women, thus the total is less than 100%.

Table II: Reasons for the three delays. Values are given as n (%).

First delay	(n=70), n (%)	Second delay	(n=73), n (%)	Third delay	(n=47), n (%)
Lack of awareness	62 (88.5)	Long distance	29 (39.7)	Delay in getting blood/FFPs	23 (49)
Lack of finances	38 (54.2)	Late referral	27 (36.9)	Delay in surgery	21 (44.6)
Male members not at home	11 (15.7)	Multiple referrals	23 (31.5)		
Domestic violence	3 (4.2)	Transport	8 (10.9)		

departments were not followed up and reported in our mortality statistics. Secondly, those pregnant patients were included who were admitted in other departments where we were involved in the management of pregnancy or delivery. A previous study from Karachi also reported hospital-based MMR as varying from 17 deaths in a private tertiary hospital to 2,736 deaths in a public-sector tertiary hospital.⁸ Hemorrhage, hypertensive disorders and unsafe abortion were the three leading causes of direct maternal deaths in this study. Similar findings have been reported by a systematic review, conducted by WHO, demonstrating hemorrhage and hypertensive disorders as the major contributors to maternal deaths in developing countries.⁹ Hepatic encephalopathy was responsible for the majority of indirect deaths, with 5 patients testing positive for hepatitis E. A study from India also reported a high prevalence (62.5%) of hepatitis E in pregnant women and mortality rate of 12%.¹⁰ Hepatitis E, therefore, seems to be an important cause of indirect maternal deaths and needs further investigation.

Among the women who were brought dead, the causes of death included hemorrhage in 5 patients and ruptured uterus, pre-eclampsia, induced abortion and puerperal sepsis in one woman each. In one patient, the cause could not be identified.

Literacy rates of 21% for women and 47% for men in Pakistan are among the lowest in the world.¹¹ This study also showed a majority of mothers to be illiterate. A study done on the influence of formal maternal education on the use of maternity services showed formal education to be a significant predictor of whether women deliver within or outside the health institutions.¹² Another study reported odds ratio of 0.30 (0.21-0.44) for maternal mortality for more than eight years of schooling compared with no schooling.¹³

Most maternal deaths occur in poor countries and poor women have the least access to skilled birth attendants.¹⁴ More than one-third of the total households in Pakistan are living below the poverty line.¹⁵ This study showed that almost 63% of the deceased women belonged to lower socio-economic class (husband's monthly income less than 5000 rupees) and another 20% belonged to lower-middle class (husband's monthly income 5000 to < 10,000 rupees). According to a study from Nigeria, 80% of mothers who died in relation to pregnancy, belonged to the lower socio-economic class.¹⁶ A study from sub-Saharan Africa showed a strong negative association between maternal mortality and Gross National Product (GNP) per capita as well as health expenditure per capita.¹⁷ Poverty has also been strongly linked to the use of maternal health services irrespective of socio-cultural and demographic aspects, with the poor using fewer services than the rich.¹⁸

The very high mortality reported from public hospitals

(including ours) may be related to the large number of unbooked cases, referred in a critical condition. The majority of women in this study did not have any antenatal care during the index pregnancy. A study has reported 88% maternal mortality among the unbooked patients compared to 11% among the booked.¹⁹ A study from North-West Frontier Province of Pakistan reported that women living near the hospital, used the facility for antenatal care, and thus recommended that antenatal care should be provided at their doorstep.²⁰

Ninety eight deceased mothers suffered delays in getting the appropriate treatment and 71 had multiple delays. The second delay was found to be the most frequent (74%) followed by the first delay (71%). However, a recent study from Nigeria which reported delay to be associated with 78% of maternal deaths, found the first delay to be the most frequent (57%).²¹

The most common reason for the first delay was lack of awareness about the seriousness of the disease followed by financial problems. The second delay was mostly due to long distance (a high number of patients came from Thatta and Balochistan from where it can take upto three hours to reach CHK) followed by late referral from the different health facilities. Multiple referrals were also a significant factor in some patients who were referred to CHK after having been to a number of different hospitals. This delay in referral could have been responsible for some mothers being brought dead.

The most frequent reason for the third delay was difficulty in getting blood, which is usually attributed to donors not being available. This was followed by delay in surgical intervention, the usual reasons for which are delay in investigations and diagnosis, delay in anaesthetist response and operating room being busy.

The strength of this study being the first study from a large tertiary care hospital of Pakistan, which has documented the reasons for the three delays of maternal mortality. This can serve as a preliminary study to be followed by other large scale community-based, case-control studies, which can provide the required data to the healthcare authorities for helping them to plan appropriate interventions for reduction of maternal mortality. A major limitation of the present study is that no control group has been studied, which could have helped in statistically comparing the socio-demographic characteristics and the frequency of delays between mothers who died and those who lived.

CONCLUSION

The very high MMR in this study suggests poor access of women to quality healthcare services. A majority of these women suffered first or second delays in their management which might be related to their poor socio-

demographic characteristics. Urgent interventions are required for bringing about an improvement in female literacy rates, socio-economic status, antenatal care attendance, delivery by skilled birth attendant as well as for providing emergency obstetric care, if the goal of reduction in maternal mortality is to be achieved.

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