Analysis of Maternal Mortality in A Tertiary Care Hospital to determine causes and Preventable factors

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Background: All pregnant women are at risk of obstetrical complications and most of these occur during labour and delivery that lead to maternal death. In our setup maternal mortality is seriously under estimated. Safe motherhood as a priority for action can not be identified with out properly assessing maternal mortality. The objectives of this study were to determine causes and preventable factors responsible for maternal mortality. **Methods:** This study was conducted in Gynaecology 'C' unit of Ayub Teaching Hospital, Abbottabad, from January 2000 to December 2001. Patients were admitted through emergency obstetrics care unit and Gynaecology out patient department. Patients' demographic record including age, parity, education, socio-economic status along with antenatal care record, level of care and distance from hospital were noted. Causative factors leading to maternal death and contribution factors evaluated. All this information was collected from patients' records. **Results:** Twenty-six maternal deaths were recorded during study period. The major causative factors were haemorrhage 9 (34.6%), eclampsia 8 (30%), sepsis 5 (19.2%), anaesthetic complications 3 (11.5%) and hepatic encephalopathy 1 (3.8%). Maternal mortality ratio was 12.7/1000 live births (26/2040). The age range was between 18–42 years. There were 16 (61.5%) patients in >30 years age group. Most of them (69%) were grand multiparas (Parity >5). Education, antenatal booking and socio-economic status were poor. The distance from hospital was between 10 and 100 KM. The level of care available at nearest health facility was estimated, 40% were attended by traditional birth attendants, 33% by lady health visitors, 10% by doctors and to 17% no level of care was available. **Conclusion:** Obstetrical haemorrhage and hypertensive disorders are still major causes of maternal deaths. Most maternal deaths are preventable. The provision of skilled care and timely management of complications can lower maternal mortality in our setup.

Key Words: Maternal mortality, obstetrical complications, preventive measures.

INTRODUCTION

Pregnancy is not a disease and pregnancy related mortality is almost always preventable. Yet more than half a million women die each year due to pregnancy related complications[1]. 95% of these come from developing world. The status of maternal health is poor in Pakistan. An estimated 30,000 women die each year due to pregnancy related causes[2]. It is estimated that about 500 maternal deaths occur per 100,000 live births each year in Pakistan. Recent estimates (WHO & UNICEF) place the figures around 340/100,000 [3] live births but in reality it may be higher because of under registration of deaths in country and absence of cause of death information.

The major causes of maternal mortality are haemorrhage, hypertensive disorders, sepsis, obstructed labour and abortions[4]. All of these causes are mostly preventable through proper understanding, diagnosis and management of labour complications. To reduce complications during pregnancy and labour it is essential to strengthen primary health care infrastructure[5]. Provision of antenatal and intrapartum health care in the community by trained health personnel form the backbone of any such efforts. The purpose of this study was to analyse causes of maternal deaths and to identify preventable factors leading to maternal mortality in our setup.

MATERIAL AND METHODS

This study was carried out in Gynaecology 'C' unit of Ayub Teaching Hospital, Abbottabad over a period of two years (2000–2001). This is a retrospective analysis. The catchment area of this hospital is 2.5–3 million population of Hazara Division. The nature of admissions is mostly emergency and referred from other hospitals in critical condition. The inclusion criteria were pregnancy complications leading to death. Record of patients' age, parity, education, socio-economic status, antenatal care, level of care and distance from hospital were analysed. Patients

with medical and Gynaecological causes and those beyond 42 days post partum were excluded from study. The data was collected from patients' records and maternal mortality statistics of the year.

RESULTS

A total of 2040 deliveries took place during the study period and there were 26 maternal deaths with maternal mortality rate of 12.7/1000 live births.

Ages ranged from 18 to 41 (27.6±6.6) years. Most of the maternal deaths (61.5%) occurred in age group >30years (Table-1).

Table-1: Distribution of Maternal Deaths in relation to age

Age group	No.	%
< 20 years	3	11.5
21-30 years	7	26.9
31-40 years	14	53.8
>40 years	2	7.6

Evaluation of causes of maternal mortality revealed haemorrhage a major cause of death (Table-2).

Table-2: Causes of Maternal Mortality

Cause	No.	%
Haemorrhage	9	34.6
Hypertensive disorders	8	30.7
Sepsis	5	19.2
Anaesthetic complications	3	11.5
Hepatic encephalopathy	1	3.8

Overall the highest maternal mortality was found in paras >5 which accounted for 69% of maternal deaths (Table-3).

Table-3: Distribution of Maternal Deaths according to parity

Parity	No.	%
Primigravidas	3	11.5
Multigravidas	5	19.2
Grand Multigravidas	12	46.1
Great Grand Multigravidas	6	23.0

Analysis of educational status was done in relation to maternal mortality and it was found that 100% of them were uneducated (Table-4).

Table-4: Educational status relationship with maternal mortality

Educational Status	No.	%
Educated	0	0
Uneducated	26	100

Socio-economic status revealed poverty as a major contributing factor in increasing maternal mortality (Table-5).

Table-5: Socio-economic status in relation to maternal mortality

Socio-economic status	No.	%
Higher class	0	0
Upper middle class	0	0
Lower middle class	11	42.3
Poor class	15	57.7

Antenatal care status was observed and none of patient was booked with any of health care facility. All patients were ignorant about the importance of antenatal checkups. Delay in seeking help was identified in >80% of cases (21 deaths). The major causes of delay are given in Table-6.

Table-6: Cause of delay in relation to maternal mortality

Cause	No.	%
Lack of transport	8	30.7
Poverty and inability to afford cost	7	26.9
Familial taboos	10	38.4
Ignorance about health care facility	1	3.8

The distance from hospital was observed and found to be between 10 to 100 Km (Table-7).

Table-7: Distance from hospital as cause of delay in relation to maternal mortality

Kilometres	No.	%
10-40	6	23.0
40-70	11	42.3
70-100	9	34.6

Level of care available at nearest health facility was observed (Table-8).

Table-8: Level of care available at nearest health facility to patients

Level of Care	No.	%
Traditional Birth Attendants	10	38.5
Lady health visitor	8	30.8
Doctors	3	11.5
None	5	19.2

DISCUSSION

The death of a woman in childbirth is a tragedy, an unnecessary and wasteful event that carries with it a huge burden of grief and pain. Pregnancy is not a disease and pregnancy related morbidity and mortality are preventable[6]. Half a million women die each year due to pregnancy related complications and 95% of them come from developing world. The lifetime risk of a woman dying of pregnancy related causes in developing countries is 1:40 as compared to 1:3600 in developed world[7].

The causes of maternal mortality are multiple, inter-related, complex and almost always preventable[8]. Complications of pregnancy and delivery are the leading causes of death and disability among women of childbearing age. In Pakistan each year over 5 million women become pregnant, out of these 0.7 million (15% of all pregnant women) are likely to experience some obstetrical and medical complications[9].

There is no systematic mechanism of data collection in Pakistan and it is extremely difficult to assess levels of maternal mortality. For correct estimation of maternal mortality it requires knowledge of death of pregnant women and cause of death. The most common causes of maternal mortality are haemorrhage 21%, Hypertensive diseases 18.6%, sepses 13,3%, abortion 11% and others 36% (1989-90 SOGP survey) [10].

The maternal mortality rates are high ranging from 286/100,000 in Karachi's urban settlement to 756 in rural Balochistan[11]. The official figures of country's maternal mortality (MM) are 340/100,000 lives births but the fact is much higher than these figures. Over 89% deliveries take place at home (94% rural and 77% urban) and approximately 80% of deliveries are conducted by traditional birth attendants who are unable to manage complications [3].

In our study the maternal mortality ratio is 12.7/1000 live births, which is higher than a previous local study conducted between 1994-97 in Women and Children Hospital (WCH) Abbottabad[12] where Maternal mortality ratio was 9.46/1000 live births. The reason of this difference is that WCH receives mostly normal cases while Ayub Teaching Hospital receives serious cases with complications and also complicated cases of other hospitals as well. Despite this difference of maternal mortality ratio in both studies the pattern of maternal mortality causes did not change over the years. Still the major causes are haemorrhage, hypertensive disorders and sepsis. The reason behind this is the persistent tradition of deliveries in domiciliary settings in unsafe and unhygienic conditions by untrained or poorly trained birth attendants.

The major cause was haemorrhage (34.6%) in our study and deaths due to haemorrhage are mostly preventable. Successful treatment requires immediate, effective and resuscitative measures[13].

Eclampsia is still a major cause of maternal mortality worldwide. The frequencies of eclampsia and hypertensive disorders is high in our country. Between 10-15% of maternal deaths are due to hypertensive disorders while 10% deaths are associated with eclampsia[14]. In our study hypertensive disorders were responsible for 8 (30.7%) maternal deaths.

Sepsis came out to be the 3rd most common cause of maternal mortality. Unsafe deliveries in unhygienic conditions lead to puerperal sepsis. Septic induced abortions make a significant proportion of maternal deaths[15]. Optimal aseptic technique can markedly reduce this proportion.

In recent years though here has been major move towards establishing primary care centres. However despite these efforts the heath care system remains dysfunctional with little supervision and poor quality of services. There are 9846 primary health care facilities in Pakistan[16] including 531 rural health centres, 5171 basic health units, 856 maternal and child health centres and 4635 dispensaries. Also there is active move towards increasing the role of private sector in providing health facilities.

Current statistics indicate that there is one doctor per 1529 persons (Economic study 2000-2001) [17]. However the distribution of these health care facilities is not uniform especially in rural areas and majority of them are concentrated in urban areas.

Multiple factors keep these pregnant women away from these available resources, such as their familial taboos, lack of education, poverty, distance from health care facility, transport or attitude of health personnel towards delivery of health services.

The last Pakistan demographic survey indicated that 70% of births took place at home without any antenatal care[18]. The percentage of births with no antenatal care increased with birth order of the mother and was higher for those ≥ 35 years of age. None of the patients in our study availed any antenatal care. The causes of lack of antenatal care are multi factorial including lowest gender ratios, illiteracy, teenage marriages, frequent pregnancies and poor access to health facilities.

One of the major underlying problems contributing to high rate of maternal mortality is generally poor educational and socio economic standing of women in Pakistan. Our literacy rate among females is one of the

lowest in the world that is 28%[19], which keeps them ignorant about their reproductive rights and health facilities. The lower life expectancy of females at birth than males (51 yr compared to 52 for males) is the result of lower status of female in our social setup plus superadded factor like malnutrition, anaemia, infection, septicemia, toxaemia and haemorrhage. Another contributing factor is delay in seeking help due to cultural factors like non-availability of males or hesitancy to go to hospital without attendants or their permission.

It is difficult for women to overcome these socio cultural constraints. Currently estimated safe motherhood indicators reveal that antenatal care during pregnancy is available to 27% only, deliveries at health facilities 13% and skilled attendants at delivery in 18% cases[20]. With this poor accessibility and availability of health services the burden of closely spaced pregnancies poses a major threat to the life of women.

Our study also revealed increased frequency of maternal mortality with increasing age, high parity, lower socio-economic status, illiteracy, socio-cultural factors and poor access to health facility. It is evident that there is great need for equity in gender relations and reproductive rights. This only comes with improving literacy in females. There is a need for community education targeting men in culturally conservative areas to improve men's consciousness about females' rights over health facilities, their reproductive rights and promoting increase use of contraceptives in both sexes.

Pakistan is the seventh most populous country of the world with population of 140 million by the year 2000 and population growth rate of 2.6%. It spends less than 1% of GNP on health and education. Keeping these two major factors in mind the need for increased contraceptive measures arises so that women's misery could be solved and we should not lose more mothers during pregnancy and childbirth. By strengthening four pillars of safe motherhood including family planning, antenatal care, clean safe delivery and essential obstetrical care the increase in maternal mortality can come to a halt.

Improving the number of booked patients especially grand multigravidas, availability of safe blood and positive approach towards life saving surgery can reduce maternal deaths to great extent. Selection of high-risk cases for hospital confinement, early referral and careful use of drugs to control fits can greatly improve our statistics.

RECOMMENDATIONS

Existing health services should be improved and emergency obstetrical care should be available to all women round the clock. Equipping the existing basic health units and rural health centres with basic obstetrics care, ensuring availability of health professionals trained and experienced in

obstetric complications may significantly reduce maternal mortality in Pakistan.

- Traditional birth attendants should be trained not to cause complications, rather recognize complications and not to manage complications on their own and they should be motivated to make referrals.
- Literacy rate should be improved so that awareness about reproductive health and use of available health resources could be optimised.
- Gender discrimination should be discouraged, so that females can make important decisions regarding reproduction.
- Repeated and closely spaced pregnancies should be discouraged and contraceptive

prevalence needs to be increased in culturally conservative areas. The role of men regarding knowledge and use of contraceptive measures should be encouraged.

- Antenatal care is the right of every pregnant lady. Provision of antenatal care should be uniform and optimal.
- Nutritional status of reproductive age group should be improved to discourage rise in maternal mortality.
- Referral system should be properly organised so that delay in seeking help could be avoided.
- Socio-economic status of community needs to be improved to avoid hindrance of high cost of care and poverty.
- Health care should be free for all pregnant women.

Non-governmental organizations should expand their services in rural areas to upgrade reproductive health status.

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