

## ORIGINAL ARTICLE

## MATERNAL MORTALITY IN A TERTIARY CARE HOSPITAL

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**Background:** Death of a woman during pregnancy and child birth is an extremely tragic event. It is a waste of a precious life that leaves great feeling of grief and pain for the family and hospital staff and has devastating influence on the community overall. Maternal morbidity and mortality can be prevented by awareness of reproductive health in a community, availability, and utilisation of organised antenatal care, skilled intrapartum management and careful postnatal follow up. Objective was to analyse the pattern of maternal mortality over the period of five years in a tertiary level hospital receiving high risk referred patients from periphery. **Methods:** All patients admitted in Gynae 'A' Unit, Ayub Teaching Hospital from January 2006 to December 2010 were included in the study and number and causes of maternal deaths were noted. **Results:** During these 5 years there were 78 maternal deaths out of 11,997 obstetrical admissions. There were 7,380 total births and 78 maternal deaths during the study period and Maternal Mortality Rate was 1,057/100,000. The main cause of maternal death was eclampsia and its complications (28.2%). **Conclusion:** Eclampsia is the leading cause of maternal mortality in our setup. Proper and timely referral is an important measure to prevent it.

**Keywords:** Maternal mortality, Eclampsia, Septicaemia, Haemorrhage, Pulmonary embolism, Antenatal care

## INTRODUCTION

Maternal mortality is defined by WHO as the death of a woman while pregnant or within 42 days of termination of pregnancy irrespective of duration and site of pregnancy, from any cause related to or aggravated by pregnancy or its management but not from accidental or incidental causes. While indirect maternal death is the one due to previous existing disease or diseases that develop during pregnancy and get aggravated by physiological effects of pregnancy.

Worldwide 500,000 women die each year due to pregnancy and child birth related events; 99% of this mortality is coming from developing countries. Out of world overall maternal mortality 46% is arising from Afghanistan, Pakistan and India. The life time risk of a woman dying from pregnancy related causes is 1:50 in developing countries and 1:3600 to 1:10,000 in developed world.<sup>1</sup> This difference does indicate that proper antenatal care and timely management of pregnancy related complications can significantly decrease maternal mortality. Availability and utilisation of health facilities is important.

Maternal mortality is a human right issue. The measures to prevent and reduce maternal mortality cannot be and should not be provided only to those who are able to pay for it. The magnitude of the problem should be recognised by the community and the government and serious efforts should be made to handle it.<sup>2</sup>

Recent estimates of WHO and UNICEF place the figures of maternal mortality ratio in Pakistan around 270/100,000 live births but in reality it is much higher due to under registration of deaths and in majority of cases causes being unknown.<sup>3</sup> Data from

Pakistan shows maternal mortality ratio 281/100,000 live births from Karachi to 673/100,000 live births in Baluchistan.<sup>4</sup> We do not have proper organised system to keep strict record of maternal deaths at community level. The majority of the statistics are the ones coming from hospital based record and may actually represent the tip of an iceberg.

The purpose of this study was to identify the pattern of maternal deaths in previous 5 years, their associated risk factors and to suggest the improvement in the approaches to prevent maternal morbidity and mortality in this regard at our tertiary care setup.

## MATERIAL AND METHODS

This study was carried out in Gynae 'A' Unit, Ayub Teaching Hospital Abbottabad. All the maternal deaths both direct and indirect were included from January 2006 to December 2010.

Case records of all the women were thoroughly evaluated and data collected regarding age, parity, educational level, socio economic and booking status and distance of locality from hospital. The causes of delay in patient's arrival at hospital were noted. Duration of the pregnancy and clinical condition of the patient and the foetus at the time of admission studied. Management received at and after admission was evaluated. The cause of death and the risk factors leading to it were noted.

## RESULTS

In our study there were 11,997 obstetrical admissions over the period of five years (2006–2010). There were 7,380 total births and 78 maternal deaths. MMR was calculated to be 1057/100,000 live births. Out of 78 deaths 21 patients (26.92%) were in age range of 18–27

years, 45 patients (57.69%) were in age range of 28–37 years and 12 patients (15.38%) were in age range of 38–48 years (Table-1).

Regarding parity of 78 mortalities 29 patients (37.17%) were primigravida, 22 patients (28.20%) were multigravida and 27 patients (34.61%) were grand multigravida (Table-2)

Out of 78 maternal deaths 22 patients (28.20) 22 were eclampsia, 16 patients (20.5) died due to septicaemia, 15 patients (19.23%) died due to haemorrhage (APH+PPH). Eleven (14.10%) patients died due to pulmonary embolism. 4 patients (5.12%) had anaesthesia complications, CCF hepatic encephalopathy and anaphylactic reaction each caused death of 3 patients (3.84%). Ruptured uterus took life of one patient (1.28%), (Table-3).

All patients belonged to poor socio-economic group, 58 patients (74.35%) were completely illiterate while 20 patients (25.64%) had primary education. Fifty (64.12 %) patients received no antenatal care while 28 patients (35.79%) had received irregular antenatal care at primary health facility in BHUs or by lady health visitors at home.

**Table-1: Total deaths**

Age range	Number	%
18–27	21	26.92
28–37	45	57.69
38–48	12	15.38

**Table-2: Parity of the patients**

Gravidity	Number	%
Primigravida	29	37.17
Multigravida	22	28.20
Grand Multigravida	27	34.61

**Table-3: Causes of death (n=78)**

Cause	Number	%
Eclampsia	22	28.20
Septicaemia	16	20.5
Haemorrhage	15	19.23
Pulmonary embolism	11	14.10
Anaesthesia complications	4	5.12
Congestive cardiac failure and cardiomyopathy	3	3.84
Hepatic encephalopathy	3	3.84
Anaphylactic reactions	3	3.84
Ruptured uterus	1	1.28

## DISCUSSION

Maternal mortality is a global health problem. The magnitude of the problem is different from country to country depending upon its resources. Maternal mortality is best shown by maternal mortality ratio. Maternal mortality ratio is total number of maternal deaths per 100,000 live births. Maternal mortality reflects a nation's health status.

In our study there were 78 maternal deaths out of 11,997 obstetrical patients and 7,380 live births, admitted in 5 years. Highest maternal mortality was

observed in patients with eclampsia followed by those with septicaemia, haemorrhage and embolism respectively.

Haemorrhage, hypertensive disorders of pregnancy and its complications, sepsis, obstructed labour and ruptured uterus and unsafe miscarriages are five leading causes of maternal deaths in developing countries. All these risk factors are preventable through proper understanding, diagnosis and timely management of pregnancy, labour and puerperium. WHO analysis of causes of maternal deaths in Asia, a systematic review shows haemorrhage to be responsible for 30.8% of maternal deaths, hypertension and its complications causing 9.1% of the maternal deaths, infections and sepsis, causing 11.6% of maternal mortality, while unsafe abortions cause 5.7%, obstructed labour 9.5% and pulmonary embolism 4% of maternal mortality.<sup>3</sup> The situation in our homeland is much worse than the rest of the world. Pakistan is included among 7 countries from where 50% of the world's maternal deaths are reported. An estimate of maternal mortality in different Pakistani sites shows overall maternal mortality ratio 433/100,000 live births, from as low as 281 in Karachi to as high as 673 in Khuzdar (Baluchistan). Fifty-three percent of this mortality is from haemorrhage, 16% from sepsis and 15% from eclampsia.<sup>4</sup>

There were 78 maternal deaths out of 11,997 patients admitted in 5 years, and 7,380 live births. Maternal mortality ratio is calculated to be 1,057/100,000 live birth.

The highest number of mortalities 22 (28.20%) were seen in eclampsia patients. The commonest cause of death in eclampsia was cerebro-vascular accident 10 patients (45.45%), followed by respiratory distress syndrome secondary to underlying pathology and vomitus aspiration 5 patients (22.72%), 3 patients (13.6%) had multiorgan failure and disseminated intravascular coagulation and 4 (18.18%) died due to pulmonary embolism.

A study from rural Sindh gives maternal mortality ratio of 297/100,000 live births. In this study 27% of maternal mortality is due to eclampsia and it is second on the list after hemorrhage.<sup>5</sup> A study in Peshawar in Lady Reading Hospital gives maternal mortality ratio 311/100,000 live births and 24.62% of deaths due to eclampsia which is again second common cause of death in their study.<sup>6</sup> In Lahore in 2006 maternal mortality ratio is calculated to be 289/100,000 live births with eclampsia being responsible for 15% of the deaths.<sup>7</sup> Situation in Baluchistan is much worse with maternal mortality ratio 560/100,000 live births and eclampsia being the third important cause of maternal mortality after haemorrhage and sepsis.<sup>8</sup> In our setup the main reason for high mortality in eclampsia was lack of proper antenatal care and delayed arrival of the patients

at appropriate medical facility. Ayub Teaching Hospital is tertiary level hospital well equipped and staffed to manage acute obstetrical emergencies. In our setup mortality from haemorrhage is less because patients present earlier and once they are in the hospital they are promptly managed. Patients with eclampsia are brought to the hospital late due to social factors like cultural taboos, myths and superstitious believes of the families. Mostly initial management is tried at home and in small setups leading to the wastage of precious time, so the patient arrives in critical condition with multiple organ failure increasing their mortality and morbidity.

Among total 78 maternal deaths 16 (20.5%) patients died due to septic shock, 13 (81.25%) patients had septic induced miscarriage with the history of gut injury at the time of presentation in 7 patients. Three (18.7%) patients developed septicaemia secondary to prolonged chorio amnionitis due to badly obstructed labour and handling at home by traditional birth attendants.

A study showed 5.6% mortality due to sepsis from Rural Sindh<sup>5</sup>, 23.91% from Lahore<sup>7</sup> and 16.3% from Khuzdar<sup>8</sup>. Septicaemia is second cause of maternal mortality in our study, mostly due to septic induced miscarriages performed in unsafe environment by semi trained personal.

Postpartum haemorrhage is third cause of maternal mortality. Out of 78 patients 12 patients (15.3%) died due to primary post partum haemorrhage. A study of rural Sindh<sup>5</sup>, one from Lady Reading Hospital, Peshawar<sup>6</sup>, a study from Lahore<sup>7</sup> and one from Quetta<sup>8</sup> all give haemorrhage top on the list in their setups for maternal mortality. A study from Rural Sindh<sup>5</sup> showed mortality due to PPH 27% and APH 13.8%, 52.9% patients died due to haemorrhage in Khuzdar<sup>8</sup> and 30.43% in Lahore<sup>7</sup> respectively.

Globally the highest maternal mortality ratios are seen in Sub Saharan Africa 1,000 maternal deaths/100,000 live births, followed by South Asia 500/100,000 live births and 250/100,000 live births in Caribbean and Latin America, while in European countries it is 10/100,000 live births. This review shows largest discrepancy of all public health statistics.<sup>9</sup>

Millennium development Goal-5 is to achieve 75% reduction in maternal mortality between years 1990–2015.<sup>10</sup> If we take a global look actually there is a reduction in maternal mortality. World statistic show maternal mortality ratio of 422/100,000 live births in 1980, to 320/100,000 live births in 1990, and 251/100,000 live births in 2008.<sup>11</sup>

Even in South Asia some of the countries have managed to significantly reduce their maternal mortality, e.g., Srilanka, China and Bhutan. In Srilanka maternal mortality ratio has decreased to 30/100,000 live birth in 1999. More than 95% of all their births occur in hospital setups.<sup>12</sup> The governments in those

countries have focused and invested in upgrading of their basic health systems and training of health workers.

Information of maternal mortality serves many purposes both locally and globally. It improves the awareness in local communities regarding maternal health and helps government in making their health policies and investment; globally it helps in the monitoring of progress towards Millennium Development Goal-5.<sup>13</sup>

Well recognised risk factors for maternal mortality in our county are increasing maternal age, parity and early marriages. Poor general health, malnutrition and infectious diseases promote CPD and obstructed labour. Poverty and lack of education are two strong determinants of maternal mortality in our community. There is lack of awareness at community level regarding reproductive health, family planning services, the importance of birth spacing for maternal and child health, antenatal care, danger signs of pregnancy and timely use of medical facilities.<sup>14</sup>

The main approaches to reduce very high maternal mortality in our country are birth spacing and family planning by adequate use of contraceptive services. Pregnancy should be made safe by well organized and purpose designed antenatal care and timely referral of high risk patients to an appropriate medical facility. Lastly the child birth should be promoted in hospital setups.

## CONCLUSION

The highest maternal mortality is observed in eclampsia patients. Septicaemia due to various aetiologies is second common cause. Primary postpartum haemorrhage and pulmonary embolism are also causing significant number of maternal deaths. Deaths in pregnancy and during labour do not occur instantaneously. Timely recognition of the problem, early referral and skilled care at medical facilities will help a lot to decrease this very high maternal mortality ratio.

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