

# Trends in Maternal Mortality in a Tertiary Care Hospital of Khyber Pakhtunkhwa

MAIMOONA QADIR

Assistant Professor, Gynae A Unit, Khyber Teaching Hospital, Peshawar

Correspondence to Dr. Maimoona Qadir Email: [dr.maimoona1983@gmail.com](mailto:dr.maimoona1983@gmail.com), Contact: 03469196731

## ABSTRACT

**Background:** Maternal mortality is an extremely devastating event for family, surviving children, hospital staff and community.

**Aim:** To analyse the rate, demography, causes and timing of maternal deaths in a tertiary care hospital of Mardan.

**Methodology:** This retrospective study was conducted in the Gynaecology Department, Mardan Medical Complex, Mardan from January 2016 to December 2020. All patients received in the study period were included and counted and causative factors of maternal deaths were recorded. A predesigned proforma was used for collection of data from the medical records. SPSS 23.0 was employed for data analysis.

**Results:** MMR of 657.7/100,000 live births was recorded. Most of the deaths (50%) were in 21-30 years age group, followed by 31-40 years age group (26%). 34(39%) patients were multigravidas, 27(31%) were primigravidas and 26(30%) were grand multigravidas. 72(82.7%) were booked and 15(17%) were unbooked cases. Haemorrhage was responsible for 39(45%) maternal deaths, Hypertensive disorders  $\pm$ HELLP caused 21(24%), Sepsis and thromboembolism caused 7(8%) each, cardiac diseases 5(5.7%), anaesthesia complicated 3(3.4%), Anaphylaxis and hepatic encephalopathy lead to 2(2.2%) each, and epilepsy caused 1 maternal death. Most (44%) maternal deaths occurred in 6-12 hours of admission.

**Conclusion:** The common causes of maternal mortality are haemorrhage, hypertensive disorders, sepsis and thromboembolism. Improvement of the maternity units in tertiary care facilities is need of the day and awareness of the general population is strongly favored to reduce or prevent maternal mortalities.

**Keywords:** Maternal Mortality, Eclampsia, Postpartum Haemorrhage, Hypertension, Thromboembolism, Sepsis.

## INTRODUCTION

Maternal mortality is defined by WHO as demise of a woman during pregnancy or within 42 days of cessation of pregnancy, irrespective of location and duration of pregnancy, from any factor related to or exacerbated by pregnancy, or its management, but not owing to incidental or accidental causes<sup>1</sup>. It is a public health problem that affects the surviving children, her family and community in a negative manner<sup>2</sup>.

Maternal mortality rates are high globally, with an average of 303,000 mortalities annually as a result of pregnancy, delivery and the related conditions<sup>3</sup>. In 2015, WHO released "Strategies towards ending preventable maternal mortality" (EPMM Strategies), are port having the global targets and practical strategic plans for prevention of maternal deaths in the SDG period<sup>4</sup>. The risk of a woman dying from pregnancy, delivery, termination or in puerperium is 1:50 in developing countries and 1:3600 to 1:10,000 in developed countries<sup>5</sup>.

Although maternal mortality rate of Pakistan has reduced from 400 in 1990 to 230 in 2015, at the moment Pakistan is still very distant from the target (140) set for 2015<sup>6</sup>. Inability to reach primary health facilities, poverty, illiteracy, lack of trained staff and home deliveries under aseptic measures are causes for increasing number of maternal mortalities in Pakistan<sup>7</sup>.

Statistics from local literature showed that MMR was 281/100,000 live births in Karachi, Sindh to 673/100,000 live births in Zyaarat, Baluchistan<sup>8</sup>. There is no efficient system for entry and recording of the maternal mortalities. Most of the data is taken from hospital record rooms and registers<sup>9</sup>.

The aim of our study is to analyze the trends in maternal deaths in last 3 years, the involved risk factors and to improve the approach to reduce and prevent maternal morbidity and mortality in our health facility.

## MATERIAL AND METHODS

This descriptive study was done at Gynae Department of Mardan Medical Complex, Mardan from January 2016 to December 2020. Validated hospital data was collected retrospectively from Gynaecology and Obstetrics registers for the period i.e., 1<sup>st</sup>

January 2016 to 31<sup>st</sup> December 2020. Data was collected on a predesigned proforma, on which all the required information was entered from the record of patients. Data collection was from records, labor registers, admission registers and maternal mortality registers of the unit. Only those women were included who died during the course of or after delivery. The patients who were received dead or who died on their way to hospital were excluded. Consent was taken from head of the institution and privacy of data collected was guaranteed that it will be used for research purpose only. The ethical committee of hospital approved the study. Statistical analysis was achieved by using the SPSS 23.0. Numerical data were shown as the mean  $\pm$  standard deviation, while the categorical variables were presented as frequency and percentages.

## RESULTS

In the study period, there were 13,228 live births and 87 women died, making the MMR 657.7/100,000 live births. In the study period, 16(8.4%) were aged less than 20 years, 43(50%) were 21-30 years of age, 22(26%) were 31-40 years and 6(6.9%) were more than 40 years of age. 27(31%) were primigravidas, 34(39%) were multigravidas and 26(30%) were great grand multigravidas. 15(17%) women received antenatal care whereas 72(82.7%) did not visit any health care facility (Table I).

Table I: Demographic characteristics (n=87)

Age	Frequency	Percentage
<20 years	16	8.4%
21-30 years	43	50%
31-40 years	22	26%
>40 years	6	6.9%
<b>Parity</b>		
Primigravida	27	31%
Multigravida	34	39%
Grand Multigravida	26	30%
<b>Booking status</b>		
Yes	14	17%
No	73	82.7%

Regarding the causes of maternal mortality, 39(45%) women died due to haemorrhage, 21(24%) due to hypertensive disorders  $\pm$ HELLP syndrome, 7(8%) due to sepsis and thromboembolism each, 5(5.7%) due to cardiac diseases, 3(3.4%) due to anaesthesia

Received on 13-08-2023

Accepted on 25-12-2023

complications, 2(2.2%) due to anaphylactic shock and hepatic encephalopathy each, and one patient died due to epilepsy (Table II). The timing of maternal deaths is narrated in Table III.

Table II: Causes of maternal mortality (n=87)

Causes of maternal mortality	Frequency	Percentage
Haemorrhage	39	45%
Hypertensive disorders+HELLP	21	24%
Sepsis	7	8%
Thromboembolism	7	8%
Cardiac Diseases	5	5.7%
Anaesthesia Complications	3	3.4%
Anaphylactic Shock	2	2.2%
Hepatic Encephalopathy	2	2.2%
Epilepsy	1	1.1%

Table III: Duration of stay in hospital before maternal death (n=87)

Duration of stay	Frequency	Percentage
4-6 hours	16	18%
6-12 hours	38	44%
12-24 hours	14	16%
24-48 hours	7	8%
48-72 hours	5	6%
>72 hours	7	8%

## DISCUSSION

Maternal mortality reflects a country's health status. Its figures vary in each country depending upon its resources. In our study the Maternal Mortality Ratio was 657.7/100,000 live births, which is quite high, as compared to the studies done in Lady Reading Hospital, Peshawar in 2019, depicting the same figure to be 431/100,000 live births<sup>1</sup> and 311/100,000 live births in another local study, whereas when we compare it with the study of Fawad A et al at Abbotabad, the figure was 1057/100,000 live births<sup>5</sup>.

In our study, maternal deaths were more in age groups of 21- 30 years, although significant numbers were reported in other age groups as well. According to Rafiq S et al, 61% of their maternal deaths were reported in the same age group which is far more than half of their study population<sup>1</sup>. There could be no explanation for why the patterns in age are observed and why the deaths are seen to reach peak in this age group. 27% of deaths occurred in this age group according to another study<sup>2</sup>.

39% of our maternal deaths happened to occur in multigravidas, this figure was found to be 45% in another study<sup>1</sup> and 28% by Fawad A et al<sup>5</sup>. 82.7% of our study population did not attend any health care facility throughout their pregnancy and landed as unbooked. Agan T et al in their research at Nigeria<sup>11</sup> and Montgomery AL et al in their study at India reported more than half of their maternal deaths were unbooked patients who presented in emergency situation to hospital<sup>12</sup>. The rural areas are amongst the most vulnerable population as there is less availability of health care facilities, poverty and lack of trained birth attendants in these areas. Lack of Antenatal care and frequent visits in cases of complicated and high risk pregnancies contributes to maternal mortality.

Haemorrhage is the leading cause of maternal death contributing to 45% of the maternal deaths. A local study from Peshawar reported 47.76% deaths to be attributed to Haemorrhage<sup>1</sup>, whereas Priya et al reported 35.05% maternal deaths owing to haemorrhage<sup>13</sup>. Khan et al observed that haemorrhage, infection, end organ damage and anaemia were amongst the basic aetiologies of maternal mortality in their study<sup>8,9</sup>. Haemorrhage was the topmost cause of maternal mortality in other local studies too<sup>14-16</sup>. Although antenatal care, timely identification and better referral systems have reduced the maternal mortality related to hemorrhage, it is still the leading cause of maternal deaths.

Hypertensive disorders with or without HELLP syndrome was the second commonest cause of maternal mortality attributing for 24% maternal deaths in our study. It was responsible for the same proportion of deaths in some local and international

studies<sup>10,17</sup>. It was responsible for 32.6% cases of maternal mortality in a research done in India<sup>18</sup>.

Sepsis and thromboembolism were the third common causes of maternal mortality contributing for 8% deaths for each. Malik FR et al in their study in 2015 concluded that sepsis was responsible for 10% whereas thromboembolism for 5% of maternal deaths which is close to our study<sup>19</sup>. Thromboembolism is a life threatening condition and the risk increases in pregnancy because of hypercoagulability and stasis which raises coagulation susceptibility. It has been reported 20% in a local study<sup>5</sup> and as low as 4% in another study<sup>1</sup>.

There are few limitations in our study. We collected data from a single tertiary care hospital, therefore the results cannot be generalized. Secondly, the study period was short and it should be more like 10-20 years to give actual trend over time.

## CONCLUSION

Maternal deaths have most common aetiologies like haemorrhage, eclampsia, sepsis and thromboembolism among the women of reproductive age. These causes are predictable and preventable as well. They can be reduced by provision of antenatal care, timely recognition and management of complications, proper referral and transport systems, proper training of LHV/TBAs and community awareness.

**Author's contribution:** MQ: Overall supervision and Write up and literature review.

**Conflict of Interest:** The authors assert that there are no conflicts of interest related to the study.

**Source of Funding:** Nil

## REFERENCES

- Rafiq S, Syed W, Ghaffar SF. Trends and cause of maternal mortality in a tertiary care hospital over five years:2013-2017. *Pak J Med Sci* 2019; 35(4): 1128- 31
- Determinants of Maternal Mortality: A thorn remains in our side. *JPMS* 2013;7(8):
- Atanasova VB, Serrano JA, Alvarado EA, Larroca SG. Maternal mortality in Spain and its association with country of origin: cross sectional study during the period 1999- 2015. *BMC Public Health* 2018; 1171:1- 9
- Jolivet RR, Moran AC, O'Connor M, Chou D, Bhardwaj N, Newby H. Ending preventable maternal mortality: phase II of a multi step process to develop a monitoring framework 2016- 2018. *BMC Pregnancy Childbirth* 2018; 18(1): 258
- Fahim F, Fahim WB, Burki F, Raees M, Lakhta G. Trends in maternal mortality in tertiary care hospital, Peshawar Pakistan-A follow up study. *PJMHS* 2022;16(8):22-24
- Ministry of Planning. Development and Reform. Government of Pakistan. Pakistan Millenium Development Goals Report 2013.
- Xie Y, Lang D, Lin S, Chen F. Mapping maternal health in the new media environment: a scientometric analysis. *Int J Environ Res Public Health* 2021; 18(24):130- 4.
- Fahim F, Nabeel N, Utman N. Trends in maternal mortality in tertiary care hospital in Peshawar-Pakistan. *JPMI* 2021;26(4): 45-7
- Khan T, Laul P, Laul A, Ramzan M. Prognostic factors of maternal near miss events and maternal deaths in a tertiary health care facility in India. *Int J Gynaecol Obstet* 2017; 138: 171- 6
- Maruf F, Tappis H, Stekelenburg J, Van Den T. Quality of maternal death documentation in Afghanistan: A retrospective health facility record review. *Front Glob Womens Health* 2021;5(2):132-5
- Agan T, Archibong E, Ekabua J, Ekanem E, Abeshi S. Trends in maternal mortality at the university of Calabar teaching hospital, Nigeria, 1999- 2009. *Int J Women's Health* 2010; 2: 249
- Montgomery AL, Ram U, Kumar R, Jha P. Maternal mortality in india; Causes and healthcare service use based on a national representative survey. *PLoS ONE* 2014; 9(1): e83331
- Priya N, Verma A, Verma S. Maternal mortality: Ten years retrospective study. *J Med Educ Res* 2010; 12: 134- 6.
- Fahim F, Nabeel N, Utman N. Trends in maternal mortality in tertiary care hospital in Peshawar, Pakistan. *J Postgrad Med Inst* 2012; 26(4): 422- 7.
- Ara S, Tahir S, Rehman A. Maternal mortality in Faisalabad and millennium Development Goals. *Pak J Med Sci* 2012; 28(3): 371- 5

16. Khan B, Deeba F, Khattak SN. Maternal mortality: a ten year review in a tertiary care set up. J Ayub Med Coll Abbotabad 2012; 24(3): 124- 7.
17. Habib S, Shams G, Ayoub S, Hussain R .Maternal mortality at a tertiary care hospital; a ten year review. KJMS 2023;16(1):3-7.
18. Paul B, Mohpatra B, Kar K. Maternal deaths in a tertiary care centre of Odisha: an in depth study supplemented by verbal autopsy. Indian J Comm. Med 2011; 36: 213- 6
19. Malik FR, Swati AA, Akhter S, Hadi A, Safi SI, Wazir S. Retrospective analysis of maternal mortality at a tertiary care hospital of Peshawar, Pakistan. KMUJ 2015; 7(1): 25- 9.

---

**This article may be cited as:** Qadir M: Trends in Maternal Mortality in a Tertiary Care Hospital of Khyber Pakhtunkhwa. Pak J Med Health Sci 2024;18(1):44-46.