

# Maternal Mortality, a Major Loss – Trend and Causes

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## ABSTRACT

**Background and objective:** Data of maternal mortality assists with enhanced awareness both locally to help government in making their health policies and globally in the monitoring of progress towards Millennium Development Goal. The objective of the study was to find out the maternal mortality ratio and its causes in a tertiary care hospital at Peshawar.

**Material and Methods:** This descriptive study was conducted in Obstetric and Gynae department at MTI, Hayatabad Medical Complex Peshawar from 1<sup>st</sup> Jan 2015 to 31<sup>st</sup> Dec 2020. All maternal deaths during the above mentioned period were analyzed retrospectively. The information and relevant data was obtained from the patient's record and mortality register.

**Results:** The maternal mortality ratio for the six years period was 223/100,000 live births. The most common cause of maternal death was hemorrhage noted in 21 cases (32.31%) followed by hypertensive disorders in 15 cases (23.08%) and pulmonary embolism in 14 cases (21.54%). Septicemia caused 6 (9.23%) of the maternal deaths. Cardiac disease and hepatic failure were noted in 2 (3.08%) cases. Most of patients were multi gravida falling in the age range of 31-40 years. 47 (72.31%) of the women did not receive antenatal care.

**Conclusion:** The major causes of maternal mortality like hemorrhage, hypertensive disorders and pulmonary embolism are preventable, if prompt and appropriate management strategies are developed and provided in time.

**Keywords:** Maternal mortality, hemorrhage, hypertensive disorders, pulmonary embolism

## INTRODUCTION

Maternal mortality ratio (MMR) i.e. the number of maternal deaths per 100,000 live births is a sensitive indicator that indicate the availability and efficacy of maternal health services to women.<sup>1</sup> Maternal deaths occurred in a hospital can be used to assess its maternal care quality.<sup>2</sup> Maternal mortality is a subject of global concern and its reduction is a major challenge for health care systems across the globe.<sup>2</sup> Recent report of WHO (2017) states that about 810 women die every day worldwide from causes related to pregnancy and childbirth.<sup>3</sup>

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Majority (about 94%) of these deaths occur in the developing world with low income/resources with almost two thirds (65%) in the African region alone followed by Southern Asia (22%).<sup>3,4</sup> No other mortality rate is imbalanced to this extent.<sup>1</sup> The MMR in under developed countries is extremely high and occurs to be 415 per 100 000 births compared to 12 per 100 000 in Europe and Northern America and only 7 per 10000 in Australia and New Zealand.<sup>3</sup>

At the country level, Nigeria with 58000 maternal deaths (19%) and India 45000 maternal deaths (15%) account for over one third of all maternal deaths in 2015 globally.<sup>4</sup>

WHO consider maternal health as one of the high priority areas of health care and placed it among the thirteen targets for the Sustainable Development Goal 3 (SDG-3) on health in 2015 with a target of reducing MMR to less than 70 deaths per 100000 live births to be achieved by 2030.<sup>5</sup>

Pakistan also placed maternal health as a core component on all national programs of primary health care. Consequently, MMR has dropped from 400 in 1990 to 230 in 2013 however it is far behind the target value of 140 set for 2015.<sup>6</sup> Several other native studies have presented

varying figures for MMR from different parts of the country.<sup>7,8,9</sup> According to a recent survey (PMMS-2019) conducted by National Institute of Population Studies Islamabad, Pakistan there is an overall decrease in the maternal mortality and maternal mortality ratio for the 3 years preceding the survey is 186.<sup>10</sup>

Consistent with the global trend<sup>2,11,12</sup>, primary causes of MMR in Pakistan include hemorrhage, eclampsia and puerperal sepsis.<sup>1,6,10</sup> Indirect causes of maternal deaths include cardiac failure, hepatic failure and anemia. Economic, social and cultural factors including poverty, limited access to health care facilities, lack of skilled medical attendance and local custom of preferring delivery at home contribute significantly to these, otherwise avoidable, maternal deaths.<sup>13</sup>

The objective of this study was to determine the current trend of maternal mortality and its main causes in a tertiary care hospital of Peshawar.

## MATERIAL AND METHODS

This retrospective study was conducted in Obstetrics and Gynaecology Unit of MTI, Hayatabad Medical Complex Peshawar spreading over a 6 years period (2015-2020). This is a tertiary care hospital receiving all kind

of patients including complicated cases referred by other health care units. Nature of admission is mostly emergency and referred from the peripheral localities in critical conditions.

Maternal deaths during the above mentioned period were analyzed retrospectively. Data was retrieved from the medical records. Demographic data including age, parity, level of antenatal care and cause of death were noted. All maternal deaths occurred during or after delivery were included in the study. Incidental deaths and deaths attributable to gynaecological causes were excluded from the study.

All the information were recorded in a pre-structured proforma. Data was analyzed using simple statistical measures and the results presented as frequencies and percentages etc. Prior approval of the ethical committee of institution was obtained to conduct the study.

## RESULTS

During the study period from 2015 to 2020, a total of 29183 live birth occurred. Total number of maternal deaths were recorded as 65. MMR for the six year period calculated to be 223/100,000 live births as shown in Table-1.

**Table-1: Maternal Mortality Trend (2015 – 2020)**

Description	2015	2016	2017	2018	2019	2020	Total
No. of Deliveries	3426	4207	4523	5060	5625	6342	29183
Mortality	4	12	13	10	15	11	65
MMR	117/100000	285/100000	287/100000	198/100000	267/100000	173/100000	223/100000

**Table-2: Distribution of Maternal deaths in regard to Demographic Characteristics (2015 – 2020)**

Description	Mortality						Total (n = 65)
	2015 (n = 4)	2016 (n = 12)	2017 (n = 13)	2018 (n = 10)	2019 (n = 15)	2020 (n = 11)	
<b>Age</b>							
20 years and below	-	1	1	1	1	1	5 (7.69%)
21 – 30 years	2	3	4	2	4	3	16 (24.62%)
31 – 40 years	2	6	6	4	7	5	28 (43.08%)
41 years and above	-	2	2	3	3	2	16 (24.62%)
<b>Parity</b>							
Primigravidas	1	3	2	1	3	2	12 (18.46%)

Multigravidas	2	4	5	3	5	4	<b>23</b> (35.38%)
Grand Multigravidas	1	5	6	6	7	5	<b>30</b> (46.15%)
<b>Antenatal Care</b>							
Yes	1	3	3	2	5	4	<b>18</b> (27.69%)
No	3	9	10	8	10	7	<b>47</b> (72.31%)

Maximum maternal deaths of 28 (43.08%) occurred in the age range of 31 to 40 years, followed by 16 (24.62%) each in the age group of 21 to 30 years and women above 41 years. With regard to parity, frequency of maternal deaths was higher in grand multigravidas followed by multigravidas, the count being 30 (46.15%) and 23 (35.38%) respectively.

**Table-3: Causes of Maternal Mortality (2015 – 2020)**

Description	2015	2016	2017	2018	2019	2020	Total
Hemorrhage	1	5	6	3	3	2	21 (32.31%)
Eclampsia	1	1	2	3	3	3	15 (23.08%)
Pulmonary embolism	1	3	4	3	4	2	14 (21.54%)
Septicemia	-	2	-	-	2	2	6 (9.23%)
Cardiac	1	1	-	-	-	-	2 (3.08%)
Hepatic failure	-	-	1	1	-	-	2 (3.08%)
Unknown	-	-	-	-	3	2	5 (7.69%)
<b>Total</b>	<b>4</b>	<b>12</b>	<b>13</b>	<b>10</b>	<b>15</b>	<b>11</b>	<b>65</b>

Hemorrhage was noted to be the eminent cause of maternal mortality accounting for 21 (32.31%) deaths followed by eclampsia which caused 15 (23.08%) maternal deaths. The third major factor was pulmonary embolism which resulted in 14 (21.54%) maternal deaths. Table-3 shows all the causes of maternal mortality.

## DISCUSSION

Maternal mortality ratio in a community indicate availability and quality of health care services and its determination is required to enable health authorities for policy making. Maternal mortality ratio of 223/100,000 live births found in this study is significantly lower compared to other studies done in tertiary care hospitals in the country<sup>1,6,9,12</sup> however it is still higher than the MDG target of 140/100,000 live births set for 2015. It mean that Pakistan is still far behind from achieving the MDG target and needs to do a lot to cover the gap.

Antenatal care is of paramount importance for safe delivery. Unfortunately, majority of women in the rural areas give birth at home without assistance of a trained practitioner. In this study, 47 (72.31%) of the maternal deaths were

those who did not receive any sort of antenatal care. Earlier research has also reported that a significant proportion of maternal death occurred in those cases who did not receive antenatal care but were referred to the maternity unit in an emergency condition.<sup>14</sup> A study performed in three Colombian hospitals claimed that 71% of adverse events were avoidable.<sup>15</sup>

When we examine the causes of maternal mortality, hemorrhage was noted to be the leading cause of maternal deaths resulting in 20 (30.77%) deaths. This is consistent with the trend in both developing and developed countries where hemorrhage is the leading contributor to maternal deaths.<sup>16,17</sup> Other studies by Rafiq et al<sup>6</sup>, Bushra et al<sup>9</sup>, Priya et al<sup>18</sup> and Ntuli et al<sup>19</sup> also reported hemorrhage as the leading cause of maternal mortality in their studies with contribution to maternal death being 47.77%, 43.55%, 35.05%, and 21.00% respectively. WHO also reported hemorrhage to be the leading cause of death in Asia (30.8%).<sup>20</sup> Some studies<sup>1,11</sup> however, reported hemorrhage as the second major contributor to maternal deaths.

The second and third leading causes of maternal mortality in our study were eclampsia and pulmonary embolism responsible for 15 (23.08%) and 14 (21.54%) of the maternal deaths respectively. Eclampsia has also been reported as the second leading contributor of maternal deaths by Bushra et al<sup>9</sup>, Begum et al<sup>21</sup>, Rahim et al<sup>22</sup> and Bhaskar et al.<sup>23</sup> Other studies<sup>12,24</sup> have presented eclampsia to be the leading cause of maternal deaths. A recent study in Turkey by Numan et al reported that 26.1% of cases were due to preeclamptic diseases which was the preeminent cause of maternal deaths. Surprisingly, pulmonary embolism, the third major factor of maternal deaths in our study has rarely been reported by other studies except Rafiq et al<sup>6</sup> who reported that 7.46% of maternal caused by Thromboembolism.

## CONCLUSION

Hemorrhage, eclampsia and pulmonary embolism are causing majority of the maternal deaths. Majority of the factors contributing to maternal mortality are preventable through timely interventions. Comprehensive efforts through multi-sectoral collaborations are needed to spread awareness at community level regarding reproductive health, family planning, antenatal care and ensure that child birth takes place under supervision of trained practitioners to reduce the maternal mortality and achieve the target MMR of 70 by year 2030.

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