Original Article

# Five Years Review of Trends in Maternal Mortality at Fatima Memorial Hospital Lahore

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**Objective:** To determine the causes and factors leading to maternal mortality with main focus on pulmonary embolism as cause of death in pregnancy

**Methods:** Review and Analysis of medical records of all maternal deaths occurred in FMH. Demographic characteristics including age, socioeconomicstatus, address was retrieved from record. Information regarding causes and events leading to death were gathered and results compiled.

**Results:** Between the year 2012-2017 there were 7856 live births and 28 maternal deaths were observed during the period of study giving a combined MMR of 356.4/100,000 live births. Leading cause of death was hemorrhage 36% followed by hypertensive diseases 18% and pulmonary embolism14% respectively. Other causes were cardiac diseases and sepsis which caused 10% and 7% deaths. Majority of deaths were observed in multigravid as 64%, unbooked and referred patients 79%.

**Conclusions:** MMRis still very high due to hemorrhage and hypertensive diseases which are preventable causes of death. Efforts should be made on primary, secondary and tertiary level to ensure proper system of assessment, management and referral. Pulmonary embolism is major cause of maternal death that cannot be ignored, deaths can be reduced by thromboprophylaxis and active management of the disease.

**Keywords:** maternalmortality, Hemorrhage, pulmonary embolism.

## Introduction

Maternal mortality is an important indicator of a health and socioeconomic development of a country. According to recent report of WHO, maternal mortality has been decreased by 43 % between 1990 and 2015.[1]Despite the decline in overall maternal mortality, several developing countries including Pakistan are making significant share toward maternal mortality worldwide.[2]

Although, there has been significant investment in maternal and child health care, maternal mortality is still a major global public health concern. Current maternal mortality rate of Pakistan is 178/100,000 live births as quoted by WHO.[3] Actually, figures are alarmingly high, because of the fact that a lot of deaths are unregistered.[4]

Among direct causes of maternal mortality hemorrhage contributes the major share, second being eclampsia followed by sepsis, unsafe abortions and obstructed labour respectively[4,5,6,7] indirect causes include anemia, hepatitis and cardiac diseases.[8] several studies confer that there is a huge disparity between the mortality of developed and underdeveloped countries, [4,9,10] which is evidence of the fact that most of the deaths are preventable, however this largely depends upon the social and economic circumstances ,health care system and health facilities available in the country.

pulmnary embolism is the major cause of maternal mortality and morbidity in pregnancy, that is often under diagnosed. A high index of suspicion is needed as symptoms are nonspecific and common in pregnancy. Pregnancy increases the risk of thromboembolism six-fold which increases further during perpeurium. Pulmonary embolism in pregnancy and perpeurium kills 5 to 10 women each year in UK. Thrombosis and thromboembolism has been the leading direct cause of maternal mortality in United Kingdom since the confidential inquiries into maternal death began.[11]However, there was a significant fall in maternal mortalities after introduction of thromboprophylaxis.[12] Incidence of pulmonary embolism is believed to be less in developing world as compared to developed countries. However, no local study is available for comparison.

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## Methods

Data collected from various sources, that include in-patient and labour ward registers, medical and surgical intensive care register and hospital birth register. Every admitted patient is assigned a specific medical record number, that is used to trace files of patient that are kept in hospital record room. Patient information collected, including demographic

characteristics including age, education level, socioeconomic status, address was noted, other important information like parity, distance from hospital and any co-morbidity were also kept in consideration. In case of referred cases information regarding level of health care facility from where referral was made and information about the expertise of health care professional was sought. Suspected cause of maternal death, complications occurring during and after delivery, sequence of events and intervention and treatment provided at the time of complication were noted. All deaths of women while pregnant or within 42 days of delivery, irrespective of the duration and site of pregnancy, or from any cause related to or aggravated by pregnancy and its management were included in study.

## Results

During the course of study there were 28 deaths. Among the causes of death 10 (36%) deaths were due to haemorrhage, 5 (18%) mothers died due to eclampsia and hypertensive disorders, 4(14.2%) deaths were due to suspected pulmonary embolism. However, diagnosis is based on clinical suspicion none of them are autopsy proved. Cause of death in 3(10.7%) patients) was acute fulminant hepatitis ,3(10.7%) deaths were due to cardiac diseases. unsafe abortions and sepsis caused 2 (7%) deaths. 1 (3.2%)was due to ruptured ectopic pregnancy.

**Table-1:** Causes of maternal death n=28 .

| Case of Death | No of patients | Percentage |
|---|---|---|
| Hemorrhage | 10 | 36% |
| Hypertensive disorders | 5 | 18% |
| Pulmonary embolism | 4 | 14.2% |
| Acute fulminant hepatitis | 3 | 10.7% |
| Cardiac Disease | 03 | 3% |
| Sepsis | 2 | 2% |
| Ruptured ectopic pregnancy | 1 | 3.2% |

**Table-2:** Distribution of demographic and obstetrical characteristics of maternal deaths at FMH.

| | | No. Of women Died |
|---|---|---|
| Age (in years) | 15-20 | 1 (3.5%) |
| | 21-30 | 19 (67% |
| | 31-40 | 8 (28.5%) |
| Parity | Primigravida | 8 (28%) |
| | Multigravida (1-4) | 18 (64%) |
| | Grandmultipara (5 and more) | 2 (7.1% |
| Booking Status | Booked | 4 (80%) |
| | Unbooked | 6 (9.7%) |
| Referral status | Reffered from other facility | 22 (79%) |
| | Self admitted | 20 (71%) |
| Mode of delivery | Vaginal | 8(29%) |
| | C-Section | 4 (14%) |
| | Undelivered | 23 (82.5%) |
| Duration of hospital stay | Less than 24 hours | 1 (3.5%) |
| Male | 24-72 hours | 4 (14%) |
| Female | More than 72 hours | 4 (14%) |

Out of total deaths Majority of the women who died (67%) were of the age 21 to 30. Mothers with parity 1-4 accounted for more than half (64%)of the total deaths. Most of the mothers (79%) has not attended 2 or more antenatal visits. A high proportion of patients who died (72%) stayed for less than 24 hours in hospital. A majority of these patients who died (82%)were delivered by cesarean section.

## Discussion

The study found a combined MMR of 356.4 per 100,000 over a period of 5 years, which has increased as compared to similar study that was done in 2007.[13]As the number of deliveries being done in hospital has been increases over this period as well as there is significant increase in number of referred patients.

In our study, hemorrhage was the leading cause of the maternal deaths that is 36% followed by hypertensive disorders 18%. similar findings were observed in several national and international studies.[7,14,15] which manifest the similar pattern of maternal mortality worldwide. However, both major causes of maternal deaths are almost always preventable.[7]so more efforts should be put on implementation of evidence based management of these two leading causes of maternal deaths. In this study, pulmonary embolism came to be third major cause of maternal deaths. Diagnosis was made on the basis of presence of symptoms highly suggestive of pulmonary embolism i.e., dysnoea, pleuritic pain and /or hemoptysis and sudden circulatory collapse.[16]Risk factors of these patients were reviewed in detail. Age above 35 and BMI more than 30 are independent risk factors for thromboembolism in pregnancy and puerperium as was observed in previous multiple studies.[17,18,19] Two out of four patients were of age more than 35, onepatient with obesity and BMI >30, one patient had parity >3. Through information collected from

hospital based data we were able to determine that most of these women have risk factors for maternal thromboembolism and none of them received thromboprophylaxis. Timely identification of these risk factors and prevention through use of thromboprophylaxis[12] would have prevented some of these deaths .This is favored by the fact that reduction in maternal mortality has been observed in united kingdom after publication and implementation of the guideline about thromboprophylaxis in pregnancy.[20]According to Royal college of obstetrician and gynecologist guideline every women should be assessed for risk factors of thromboembolism in prepregnancy and early pregnancy ,risk assessment should be repeated on hospital admission , intrapartum and postpartum.

MMR in our study is slightly lower as compared to study conducted at ayub medical college recently, that was 772/100,000 for 10 years.[21]However, there is wide range of difference between maternal mortality of different regions of Pakistan. still results may be biased because of the fact that data does not represent the actual facts and figures of community because the proper system of data collection is lacking in our country.[21]

Begum et al reported 69%, 19.2% and 11.5% maternal mortality in grandmultipara, multipart and primigravida respectively.[7] While In our study death rate among the multiparous women (64%) was higher as compared to primiparous women (28%) and lowest in grandmultipara (7%).According to our study higher proportion of deaths were noted in patients who were unbooked (79%).they visited hospital facility less than two times during antenatal period .similarly higher death rate was reported among the patients who were referred(71%) as compared to patients who were already booked(29%) in the same hospital .These results closely resemble some international studies done in developing countries.[22,23]The main reason being most of the patient referred in critical and moribund condition and a lot of factors affect the outcome of the patient i.e. time of transfer from the health care facility, skills of health care provider[22] who attended the patient and condition at the time of referral.. A lot of patients who died stayed in hospital for less than 24 hours (72%) which represent most of them came in critical condition

Hospital based study does not represent the actual figures of general population as some information of study participants must eliminate in analysis and hospital mainly received complicated cases which can lead to selection bias. However, a large sample size over a period of 5 years provides us with a quick review of trends in maternal mortality.

## Conclusion

Hemorrhage and hypertensive diseases are still the major causes of maternal mortality. Both are preventable. If proper antenatal and peripartum care is ensured, maternal mortality can be reduced. Deaths due to pulmonary embolism can be prevented by risk assessment and prevention in the form of thromboprophylaxis.

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