

An Identification of the Underlying Primary Causes of Maternal Death.

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Abstract:

Background: Maternal death is a tragedy for an individual woman, her family and the community. Globally, maternal mortality rate (MMR) is one of the health status indicators of women in a country. We carried out a descriptive study in the department of Obstetrics and Gynaecology, SSMC & Mitford Hospital, Dhaka, Bangladesh during the period from July 2015 to June 2017.

Aim of the study: The aim of this study was to identify the underlying primary causes of maternal death.

Methods: Purposive sampling method was applied to get desired number of samples. A total number of 48 cases were enrolled in this study. Ethical clearance was taken from the ethical committee of Sir Salimullah Medical College and Mitford Hospital, Dhaka. Data were collected in a pre-designed data collection sheet from the records of maternal death cases of Mitford Hospital after taking permission from the authority.

Result: Out of 48 patients, it was observed that majority (64.58%) patients belonged to the age group 20-29 years and only 10.40% were between 15-19 years. The mean age was 25.42 ± 3.89 years. It was observed that 33.33% patients had hypertension, 22.92% patients arrived in hospital with delay and both unsafe abortion and cardiac diseases were in 10.42% patients. Among the 48 study patients 40.0% had caesarean section, 20.0% vaginal delivery and maternal deaths occurred as undelivered in 11.0%. Percentage distribution of the study patients based on duration between admission in hospital and death was 46.0% of deaths occurred within 24 hours of hospital admission and 42.0% patients died after 48 hours.

Conclusion: Countries with higher number of maternal deaths like Bangladesh face greater challenges in setting up a system that captures all maternal deaths. Systems should be set up in a way that ensures all maternal deaths are reviewed, or at the very least, analyze a sufficient number of cases to avoid biases and promote learning.

Key Words: Obstetrics, Maternal death, Facility Based Maternal Review

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I. Introduction

A maternal death is the death of a woman while pregnant or within 42 days of the end of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Maternal Mortality Ratio (MMR) is the number of women who die from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, per 1,00,000 live births. Levels of maternal mortality vary greatly across the regions, due to variation in underlying access to emergency obstetric care, antenatal care, anemia rates among women, socioeconomic conditions, education levels of women and other factors. An accurate estimation of national MMR requires three things: Complete records of all deaths, good attribution of causes of death and knowledge of the pregnancy status of women of reproductive age who die. Reducing maternal deaths is an integral part of the global agenda to achieve Millennium Development Goals (MDGs) 4 and 5 by 2015. Globally, there has been a 44% reduction in maternal deaths and a drop in the annual number of maternal deaths from 532,000 in 1990 to 303,000 in 2015.¹ Recent data have shown that the majority of maternal deaths occur in developing countries: as many as 95% of total maternal deaths occur in low and middle-income countries.² Though countries within Asia are at particularly high risk; Bangladesh has made encouraging progress in reducing maternal mortality over the past two decades; since 1990, maternal mortality has fallen by two-thirds.³ Maternal mortality has reduced from 574 deaths per 100,000 live births in 1991 to 194 deaths in 2011.⁴ Recent data in Bangladesh from the maternal death review highlighted that 47.8% of maternal

deaths occurred in facilities⁵ and that in more than 80% cases the deaths could have been avoidable, even in resource-constrained conditions and often minimal changes can improve maternal survival. Thus, pregnancy-related mortality and morbidity continues to have a huge impact on the lives of Bangladeshi women. FBMDR is a qualitative, in-depth investigation of the causes of (mainly clinical and systemic) and circumstances surrounding a maternal death at a health facility; the death is initially identified at the facility level but such reviews are also concerned with identifying the combination of factors at the facility and in the community that contributed to the death, and which ones were avoidable. It requires cooperation from those who provided care to the woman died and their willingness to report accurately on the management of the case. Information obtained should preferably be supplemented by data from the community, but may not always be possible. The death audit approach is one of the most effective methods for improving health service performance to reduce maternal deaths in health care facilities. The WHO developed the Commission on Information and Accountability (COIA) for Women's Health Secretariat in Bangladesh to strengthen the death review system and also implement the WHO Maternal Death Surveillance and Response (MDSR) program. Though MDR is practiced for maternal deaths in a number of countries; however, there is a paucity of comprehensive reviews of facility deaths in Bangladesh. The main principles of FBMDR are to maintain anonymity, confidentiality and non-threatening environment without accusing or blaming any individual and commitment to act. Every maternal death has a story to tell and provides information to unlocking barriers to improve services but these findings must be acted upon for real change to occur at policy, program, and facility levels as demonstrated in South Africa, Egypt, Mali, Senegal, and South-East Asia.⁶ The purposes of a maternal death review are: To initiate action to solve identified problems, to improve the quality of safe motherhood programming and to prevent future maternal morbidity and mortality.⁷ To provide a rare opportunity for a group of health staff and community members to learn from a tragic and often preventable event. The objective of MDR is to collect information on all maternal deaths, in order to gain as complete as possible a picture of the causes and circumstances associated with intra-hospital maternal deaths, to identify various delays causing maternal deaths in the health facilities and to enable the health system to take corrective measures at various levels. A Lebanese study mentioned that the FDR approach helped professionals to understand the causes and determinants of maternal mortality.⁸ The main causes of maternal mortality are known, and more than 80% of maternal deaths could be prevented or avoided through actions that are proven to be effective and affordable, even in the poorest countries in the world.⁹ Indirect maternal deaths are those resulting from previous existing disease or disease that developed during pregnancy and which was not due to direct obstetric causes, but which was aggravated by physiologic effects of pregnancy.

II. Objectives

a) General objective:

- To identify the underlying primary causes of maternal death.
- To evaluate each maternal death and to decrease the maternal mortality in tertiary health facility.

b) Specific Objectives:

- To determine the contributing factors related to maternal death.
- To find out the missing opportunities behind each death.

III. Methodology And Materials

We carried out a descriptive study in the department of Obstetrics and Gynaecology, SSMC & Mitford Hospital, Dhaka, Bangladesh during the period from July 2015 to June 2017. Our aim was to identify the underlying primary causes of maternal death. Purposive sampling method was applied to get desired number of samples. A total number of 48 cases were enrolled in this study. Ethical clearance was taken from the ethical committee of Sir Salimullah Medical College and Mitford Hospital, Dhaka. Data were collected in a pre-designed data collection sheet from the records of maternal death cases of Mitford Hospital after taking permission from the authority. Necessary data were collected from admission register, case files and death certificates using a structured questionnaire. At every step of data collection, processing and analysis, the procedure was followed strictly. Accuracy of data collection was ensured. For that purpose, at first work manual was made. Then a sample size and suitable study place were selected. A standard case record form was designed for data collection.

• Inclusion Criteria

- Socioeconomic status
- Antenatal check-up
- Process of termination of pregnancy

• Exclusion Criteria

- Patients brought dead.
- Delay in hospital arrival

- Primary causes of maternal deaths

IV. Results

A total number of 48 cases were undergoing Patients who died of pregnancy and its complications. Table I shows the age distribution of the study patients. Out of 48 patients, it was observed that majority (64.58%) patients belonged to the age group 20-29 years and only 10.40% were between 15-19 years. The mean age was 25.42 ± 3.89 years. Table II showing the different socioeconomic status of the study patients where most of the patients (45.83%) belonged to lower middle class and only 6.25% were from upper class family. Table III shows the contributing factors of maternal death. It was observed that 33.33% patients had hypertension, 22.92% patients arrived in hospital with delay and both unsafe abortion and cardiac diseases were in 10.42% patients. Figure I pie chart shows percentage distribution of the study patients on various modes of termination of pregnancy. It was observed that among the 48 study patients 40.0% had caesarean section, 20.0% vaginal delivery and maternal deaths occurred as undelivered in 11.0%. Figure II pie chart shows percentage distribution of the study patients based on duration between admission in hospital and death. It was observed that 46.0% of deaths occurred within 24 hours of hospital admission and 42.0% patients died after 48 hours.

Table I: Distribution of the study patients by age. (n=48)

| Age (years) | n=48 | % |
|-------------|------|-------|
| 15-19 | 5 | 10.40 |
| 20-24 | 15 | 31.25 |
| 25-29 | 16 | 33.33 |
| >30 | 12 | 25.02 |

Mean \pm SD = (25.42 \pm 3.89) years, Range (min, max) = 16 – 38 years.

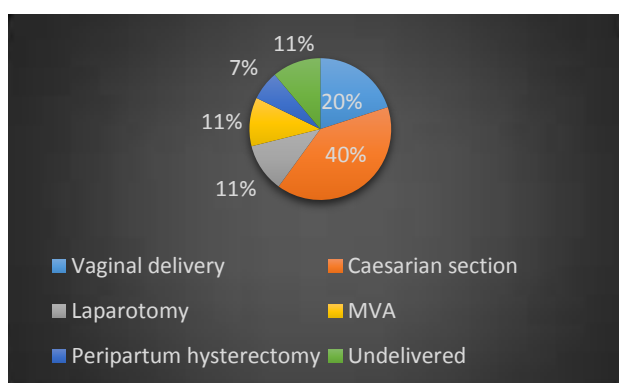


Figure I: Distribution of various modes of termination of pregnancy (n=48)

Table II: Distribution of socioeconomic status of participants (n=48)

| Socioeconomic status (taka/month) | n | % |
|-----------------------------------|----|-------|
| Lower class (< 10,000) | 15 | 31.25 |
| Lower middle class (10-20,000) | 22 | 45.83 |
| Upper middle class (21-30,000) | 8 | 16.67 |
| Upper class (> 30,000) | 3 | 6.25 |

Table III: Antenatal check-up status of participants (n=48)

| Visits | n | % |
|-------------|----|-------|
| Regular | 3 | 6.25 |
| Irregular | 10 | 20.83 |
| No check-up | 35 | 72.91 |

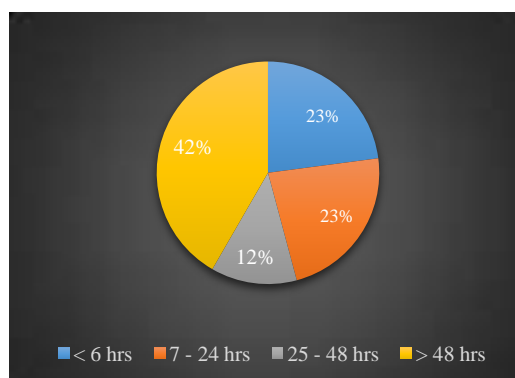


Figure II: Duration between hospital admission and maternal death (n=48)

Table VI: Distribution of the contributing factors of maternal death (n=48)

| Contributing factor | n | % |
|-------------------------------|----|-------|
| Severe anemia | 9 | 18.75 |
| Hypertension | 16 | 33.33 |
| Cardiac diseases | 5 | 10.42 |
| Unsafe abortion | 5 | 10.42 |
| Delay in hospital arrival | 11 | 22.92 |
| Delay in referral & diagnosis | 2 | 4.17 |
| Others | 3 | 6.25 |

V. Discussion

The study was carried out with an aim to evaluate each maternal death and to decrease the maternal mortality in tertiary health facility in future. Seventy three (72.91%) (n=35) study patients had no antenatal check-up whereas only 4.17% (n=2) had regular antenatal check-up. This considers need of adequate antenatal care for prevention of maternal mortality. This study found that majority (64.58%, n=31) patients belonged to the age group 20-29 years which reflects the prevailing social norms of early age of marriage and child birth. Other hospital based studies showed maternal deaths of 49% in similar age group. But several studies in European countries showed, more than half of maternal deaths are among 25-34 years. This study found no definite relationship of parity with maternal death but strong relationship with socio-economic condition was found as majority (45.83%, n=22) of deceased mothers were from lower middle class family. In a retrospective study in North Yemen during 1989-1991 based on maternal deaths in 10 tertiary hospitals found similar result that 177 of the 224 maternal deaths had a lower standard of living. In this study, severe anemia was found in 18.75% (n=9) cases of maternal deaths as a contributing factor and 20.83% (n=10) maternal deaths were facilitated by unavailability of blood as it is the key issue of hemorrhage management. Several studies have revealed that maternal death was more after caesarean section and 3rd and 4th pregnancies are more likely to be affected. This study found that among the 48 study patients 40.0% had caesarean section and the finding significantly vary with the study where in 86.0% cases caesarean section was the main surgical intervention. Incidence of delayed arrival in hospital was 22.92% (n=11) which has a significant correlation as 23.0% of maternal deaths occurred within 6 hours of hospital admission. Different safe motherhood interventions reveal that most delays are multi causal as community people not aware of danger signs of pregnancy and not being prepared for an emergency and irresistible beliefs on social, cultural and religious ground are strong competitors of seeking medical care at appropriate time. A more representative study was conducted in Malawi in 1977¹⁰ that included deaths occurring over one year in all 15 hospitals and 92 midwife-run maternity units in a region. Delay in seeking treatment contributed to 32.0% and 28.0% of rural and urban maternal deaths in some studies¹¹ in contrast to 22.92% (n=11) of this review. This study also identified avoidable factors related to medical services as well as to the patient and home environment, leading to a recommendation to introduce traditional birth attendant (TBA) training.

LIMITATIONS OF THE STUDY

It was a descriptive type of study with small sample size, which may not reflect the scenario of the whole country. For getting more specific findings we would like to recommend for conducting similar more studies with larger sized sample.

VI. Conclusion And Recommendations

This study shows that facility-based maternal death reviews are simple, non-blaming, and can easily be performed within the existing health system. Although it requires intensive supervision, monitoring, and support to overcome obstacles, they also provide the opportunity to improve outcomes for mothers at health facilities in Bangladesh. This study recommends immediate attendance, evaluation and treatment on patient's arrival at the facility health center. The review identified that well coordination between the attending physician and the laboratory and blood bank staffs should be established. Development of clinical protocol and strict adherence to it by the medical staffs should be established to address the gap of inadequate treatment. Maternal mortality surveillance system should be a routine practice in health care system. Countries with higher number of maternal deaths like Bangladesh face greater challenges in setting up a system that captures all maternal deaths. Systems should be set up in a way that ensures all maternal deaths are reviewed, or at the very least, analyze a sufficient number of cases to avoid biases and promote learning. In addition, regular maternal death surveillance is essential to develop a standardized death Review protocol. A national guideline should be developed to universalize the maternal death review surveillance system.

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