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EVALUATE THE DIRECT AND INDIRECT ETIOLOGIES OF MATERNAL MORTALITY: A RETROSPECTIVE ANALYSIS.

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Abstract

Aim: prevalence and the various direct and indirect etiologies of maternal mortality.

Materials and Methods: The present 1 years retrospective hospital based study was conducted in the Department of Obstetrics and Gynecology, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar, India

Results: A total of 56 deaths were analyzed. The mortality rate in study period was 333 per 1,00,000 live births. Maximum maternal deaths (60.7%) were reported in the age group 21-25 years. More deaths were reported in multiparous women (67.9%) as compared to primiparous women (32.1%). Most of them were unbooked cases (60%). Hemorrhage (30.4%), eclampsia (16.1%), sepsis (12.5%) and embolism (7.1%) were the major direct causes of maternal death. Anemia (16.1%) was the major indirect cause of death.

Conclusions: Hemorrhage is the leading cause of maternal death followed by hypertensive disorders and sepsis. Anemia continues to be the most common indirect cause. Majority of maternal deaths were preventable by proper antenatal care, early detection of high risk pregnancies and their timely referral to tertiary care centre.

Keywords: MMR, Hemorrhage, Sepsis, Anemia

Introduction

Women die every year in India which contribute 20‑25% of all maternal deaths in the world.[i,ii] Maternal mortality is an indicator of the quality of obstetric care in a community, directly reflecting the utilization of health-care services available.[iii]

According to the WHO, ''A maternal death is defined as death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of pregnancy, from any cause related to or aggravated by pregnancy or its management but not from accidental or incidental causes'' (ICD-10).[iv]

From 2000 to 2017, the global maternal mortality ratio declined by 38% - from 342 deaths to 211 deaths per one lakh live births, according to UN inter agency estimates. This translates into an average annual reduction of 2.9%. Though it is substantive, this is less than half the 6.4% annual rate needed to achieve the sustainable development global goal of 70 maternal deaths per one lakh live births. According to UNICEF, worldwide sub-Saharan Africa and South Asia, contributes for 88 per cent of maternal deaths worldwide where 66% of all maternal deaths is contributed by sub-Saharan Africa & 22% by South Asia per year. At the country level India contributes one-fifth to the global maternal mortality.[v]

Maternal mortality is ascribed usually to complications that generally occur during or around labor and cannot be accurately predicted. The direct causes of maternal mortality, that is, hemorrhage, unsafe abortion, eclampsia, obstructed labor, infection, and others account for about three-fourths of maternal deaths. The remaining one-fourth are indirect causes such as anemia, hepatitis, heart disease, malaria, and human immunodeficiency virus (HIV)/ acquired immunodeficiency syndrome (AIDS). The other contributory causes are early marriage, adolescent pregnancy, poverty, malnutrition, harmful traditional practices, illiteracy/ignorance, etc.[vi] These are mostly preventable through regular antenatal checkup, proper diagnosis, and management of labor complications.[vii] One of the most important goals of the MDGs is to reduce the maternal mortality. It was in this context, this study was conducted with the aim to assess the prevalence and the various direct and indirect etiologies of maternal mortality in a tertiary care Hospital in Bihar.

Materials and Methods

The present retrospective hospital based retrospective study was conducted in the Department of Obstetrics and

Gynecology, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar, India. The study was carried out over a period of 1 year.

Ethical approval and Informed consent

The study protocol was reviewed by the Ethical Committee of the Hospital and granted ethical clearance.

Inclusion criteria

All booked or unbooked maternal deaths admitted at the time of pregnancy, delivery or during puerperium were included in study.

Methodology

The information regarding demographic profile, reproductive profile, etiological profile (cause of death), and time interval from admission to maternal death were collected from the records of labor room, medical intensive care unit (ICU), and surgical ICU of the hospital. There were a total of 16,820 live births and 56 maternal deaths. Total 56 maternal deaths were carefully studied and analyzed.

Statistical analysis

The recorded data was compiled entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to data editor page of SPSS version 20 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages, means and standard deviations were calculated.

Table 1: demographic profile of the study population

Variables	N (%)
Age (years)	
≤20	7 (12.5%)
21-25	34 (60.7%)
25-30	10 (17.9%)
>30	5 (8.9%)
(Mean±SD)	24.31±2.83
Parity	
Primipara	18 (32.1%)
Multipara	38 (67.9%)
Total	56 (100.0%)
Booking status	
Booked	21 (37.5%)
Un-booked	35 (62.5%)

Table 2: etiologic profile of the study population

Variables	N (%)
Direct [N= 40 (71.4%)]	
Hemorrhage	17 (30.4%)
Eclampsia	9 (16.1%)
Sepsis	7 (12.5%)
Embolism	4 (7.1%)
Others	3 (5.3%)
Indirect [N=16 (28.6%)]	
Anemia	9 (16.1%)
Hepatitis	4 (7.1%)
Others	3 (5.3%)
Total	56 (100.0%)

Discussion

Every pregnancy should culminate in healthy mother and healthy baby and for that we need to ensure that all women should have access to high quality essential and emergency obstetric care along with promotion of overall safe motherhood. Death of mother is a tragic event. In practical life, it has a severe impact on the family, community and eventually, the nation. According to estimates by the United Nations, at current levels of fertility and mortality, 1 in 190 women in India face the risk of maternal mortality compared with 1 in 170 in Pakistan and 1 in 1400 in Sri Lanka.[viii] Recently UNICEF has estimated that approximately 80% of maternal death could be averted if women had access to essential maternity and basic health care services.[ix]

The maternal mortality ratio (MMR) in our study is 333 per 1,00,000 live births which is very much higher than national standards of MMR in India that is 212 per 1,00,000 live births.[x] Present study has comparatively higher MMR which could be due to the fact that our hospital is a tertiary care hospital and receives a lot of complicated referrals from rural areas. In a study by Tayade et al reported an MMR of 242 at Wadgwa, Maharashtra where as Shivkumar et al reported MMR of 974 at VIMS Bellary, Karnataka.[xi,xii]

In the present study maximum number of deaths 60.7% occurred in age group of 21-25 yrs of age group. Urmila mahala conducted a study in maternal mortality in tertiary care hospital in Rajasthan: A 10 yr review also showed similar results as present study, where maximum maternal deaths (47.4%) occurred in age group 21-25 yrs.[xiii] A retrospective study at Dibrugarh Assam observed maximum deaths in age group 15-20 yrs.[xiv]

In our study majority of mothers were multipara (67.9%) followed by primipara (32.1%). Similarly 42.10% were primigravidas and 57.89% were multigravidas in the study by Bangal et al.[xv] and 56.41% were multipara and 35.90% were primipara in the study by Yerpude et al.[xvi] Increased number of pregnancies and decreased interval between pregnancies together adversely affect the mother's health and responsible for fatal outcomes.

This study revealed that 28.6% maternal deaths were due to indirect obstetrical causes and 71.4% due to direct causes. Other studies have shown variations in direct obstetrical deaths, 68.70% in a study by Kulkarni et al.[xvii] and 60% by Salhan et al.[xviii] Common direct causes of maternal mortality in our study were hemorrhage (30.4%), eclampsia (16.1%), sepsis (12.5%) and embolism (7.1%). In a study by Bangal et al.[8], hemorrhage (21.05%), eclampsia and pulmonary embolism (10.52%), and sepsis (7.89%) were the main direct causes of maternal mortality. Hemorrhage especially during postpartum is sudden,

unpredictable, and more dangerous when woman has preexisting anemia. Anemia (16.1%) was the most common indirect cause of maternal mortality in our study similar to other studies on maternal mortality.[9,xix] So focus on anemia prevention and treatment can help in decreasing maternal mortality.

Conclusion

Haemorrhage is the leading cause of maternal death followed by hypertensive disorders and sepsis. Anemia continues to be the most common indirect cause. Maternal death is an avoidable tragedy and most of the causative factors can be prevented to a large extent, only if antenatal women seek and receive good antenatal care to correct anemia, sensitized about family planning, identify complications early and are timely referred to an appropriate facility.

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