

ORIGINAL ARTICLE

Prevalence and Reasons for Maternal Mortality: A Retrospective Study

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ABSTRACT

Aim: To determine the prevalence and reasons for maternal mortality at a tertiary care hospital

Study design: A retrospective study

Place and duration: This study was conducted at Maternal and Child Care Center Hyderabad Pakistan from June 2018 to June 2020.

Methodology: To gain access to the records, convenience sampling was utilized. A self-contained proforma was used to gather verified data on variables (age, year of death, cause of death, and domicile), Excel 2016 was used to examine the data and trend analysis was performed using Join point Analysis Software.

Results: In three years, 279 maternal fatalities have been reported from "Hyderabad." With 29.4 % (CI= 0.68, SD= 10.42), hemorrhage remained the primary cause, subsequently, eclampsia 16.13 % (CI= 0.63, SD= 7.48), ruptured uterus 8.6 % (CI= 0.56, SD= 8) and sepsis 5.73 % (CI= 0.44, SD= 5.47). The highest rate of maternal fatalities was 40.50 % in women aged 26 to 30, followed by 25.1 % in women aged 15 to 25, 21.15 % in women aged 31 to 35, and 13.26 % in women aged 36 to 40. The P-value for post-partum bleeding was significant (0.003).

Conclusion: Maternal mortality continued to increase in women of child bearing age, with principal reasons including hemorrhage, eclampsia, uterine rupture, and sepsis. To avoid these deaths, early referral, decreasing cesarean section rate, improved monitoring during labour and maternal care by skilled personals and community-based education are both in desperate need of improvement.

Keywords: Maternal Mortality, Child-bearing age, Obstructed Labor, Eclampsia, Postpartum Hemorrhage, Ruptured uterus, Pulmonary Embolism.

INTRODUCTION

Maternal Mortality (MM) is define as if a woman dies while pregnant or within 42 days after giving birth from any reaction to or worsening of, the pregnancy or its treatment, excluding an accident or incident. It is a huge public health issue with negative consequences for the surviving children, their families, and the community [1]. In underdeveloped nations, the chance of women dying from pregnancy-related reasons is 1:40 that of developed countries [2]. A country's Maternal Mortality Ratio (MMR) reflects its health and development condition [3]. The World Health Organization's (WHO) proposed fifth Millennium Development Goal (MDG-5) for enhancement of maternal health aims to lower the global maternal death ratio by 75% by 2015 [4]. A total of 289000 mothers throughout the world died during pregnancy and childbirth in 2013. In 2013, the MMR in industrialized nations was 16/100,000 live births, but in underdeveloped countries, it was 230/100, 00 live births [5]. The area of Sub-Saharan Africa alone (62 %) contributed the most to worldwide maternal fatalities, followed by Southern Asia (24 %) [6]. Although Pakistan's MMR has decreased from 400 in 1990 to 230 in 2013, the country is now off course and falls short of the objective (140) set for 2015 [7]. Various local investigations have revealed varying MMR values from various sections of the research. The majority of maternal fatalities are caused by direct causes, the most prevalent of which is hemorrhage [8]. A lack of access to health care facilities, poverty, and a

lack of qualified primary health care practitioners are all factors that contribute to Pakistan's high death rates. Many studies on this issue have previously been carried out in NWFP, the majority of them were finished between 1998 and 2012, while studies in Peshawar were carried out until 2009. After 2009, the studies didn't give any information on maternal deaths. Furthermore, a trend analysis of the causes of maternal death has been reported just once in KPK, using data only up to 2009 [8]. This prepared the path for this research, which aimed to collect current data, examine changes in the reasons, and rule out significant hazards to women in our society throughout their reproductive years to offer a complete picture of the province. The current study is planned to determine the prevalence and reasons for maternal mortality at a tertiary care hospital

METHODOLOGY

The data collection tool was a self-structured performa that was used to extract the necessary information based on medical records of all hospitals of Hyderabad city . The information was taken through patient case sheets, labor registrations, and maternal death registers at the hospital. Variables regarding the dead mother's name, cause of death, year of death, and age of the female who died were included in the Performa. The study only included women who died during or shortly after delivery .. Patients who were rushed to the emergency department or died as a

result of a delay in arriving at the hospital, resulting in a complication or death of the patient while in transit, were excluded from the data.

Eclampsia, postpartum hemorrhage (PPH), antepartum hemorrhage (APH), HELLP syndrome, pulmonary embolism, ruptured uterus, obstructed labor, anesthetic complication, and sepsis were the most common direct causes of mortality. Rising cesarean section rate further worsen the maternal mortality due to placenta accreta, anesthetic complication and pelvic sepsis secondary to surgery. Maternal mortality secondary to medical causes such as cardiac arrest, anemia, hepatitis, renal disease, TB, and diabetes mellitus were classified as maternal mortality due to indirect causes. The relevant hospital's Medical Superintendent (MS) and the Gynecology/ Obstetrics unit's Head of Department (HOD) provided their approval. The data was gathered with the understanding that it would be utilized just for study and would not be shared with anyone else. The information was collected with the understanding that it would only be used for research purposes and would not be shared with anyone else. In Excel 2016, the causes of maternal death were evaluated year by year, with mean, standard deviation, and confidence intervals calculated for each cause. In Excel 2016, maternal fatalities by age groups were studied and a graph was created. Join Point Analysis software was used to determine the trend analysis of maternal mortality caused by computing yearly percent change, test significance, confidence intervals, and p-values for all causes. The p-value limit was set at 0.003. Join point is statistical software that analyzes trends using Join point models. The program fits trend data to the simplest Join point model it can find. The minimum and maximum number of Join points that should be utilized are specified by the user. The show's title is beginning has the

fewest possible Join points. This enables the user to judge whether or not a seemingly substantial trend shift is statistically significant. The Monte Carlo Permutation technique is used for the significance tests. A Poisson model of variation or approximated variation at each location may be used in the models (For example, where the responses are age-adjusted rates). Furthermore, the models may be linear in terms of the answer's logarithm (e.g., for calculating annual percentage rate change). You may also see a single graph for each Join Point model, beginning with the simplest and working your way up to the most complicated.

RESULTS

There were 279 deaths during the three-year study. Hemorrhage (APH & PPH) was the leading cause of maternal death throughout three years, accounting for 24.73 % of fatalities, followed by eclampsia and ruptured uterus, which accounted for 16.13 % and 8.6 % of deaths, respectively. The bulk of maternal deaths were caused by septic abortions, which accounted for 5.73 % of all maternal deaths. Anemia, TB, diabetes mellitus, hepatitis, cancer, and cardiac arrest were among the indirect causes of death for 24.73 % of women. Table 1 shows the mean, standard deviation, and confidence intervals for all direct and indirect causes of maternal death. In Join point analysis software, graph 1 illustrates a trend analysis of post-partum bleeding. With an annual % chance of 63.17 and a p-value of 0.003, PPH was shown to be significant among all causes of maternal death. In Graph 2, women aged 26-30 years had a 40.50 % greater risk, followed by 25.10 % in 15-25 years, 21.15 % in 31-35 years, and 13.26 % in 36-40 years, respectively.

Table 1: Causes of maternal death

Causes	2018	2019	2020	Total Maternal Deaths n (%)	Mean	Standard Deviation	Confidence Interval
Hemorrhage	19	30	33	82 (29.4%)	27.33	10.42	26.88,27.78
Eclampsia	11	13	21	45 (16.13%)	15	7.48	15.45,14.55
Ruptured Uterus	7	9	8	24 (8.6%)	8	1.41	7.55,8.45
Sepsis	5	2	9	16 (5.73%)	5.33	5.47	4.88,5.78
Pulmonary Embolism	4	3	11	18 (6.45%)	6	6.16	5.55,6.45
HELLP Syndrome	1	4	5	10 (3.58%)	3.33	3.55	2.88,3.78
Obstructed Labor	3	5	5	13 (4.66%)	4.33	1.71	3.88,4.78
Anesthesia Complications	0	1	0	1 (0.36%)	0.33	0.77	0.28,0.38
Septic abortion	0	0	1	1 (0.36%)	0.33	0.77	0.28,0.38
Indirect Causes	11	31	27	69 (24.73%)	23	14.97	22.55,23.45

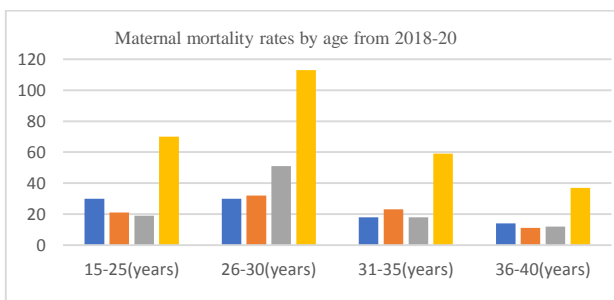


Figure 1: Maternal deaths distribution in age groups from 2018-2020

DISCUSSION

This was a three-year retrospective assessment of records that revealed causes of direct maternal death. The most common causes of death were hemorrhage, uterine rupture, eclampsia, and infection [9]. Maternal fatalities were more common in women aged 26 to 30, although deaths were also recorded in other age groups. It might be because lack of antenatal care and lack of identification of high-risk factors among younger women probably primigravida and increasing cesarean section with its complications explain why these age patterns are prominent and why deaths peak at this age. In latter age

group mortality is mainly due to post partum haemorrhage and septic miscarriage which indicates failure of contraceptive services in community. This is retrospective three-year research of maternal mortality causes, only postpartum hemorrhage was consistently higher and statistically significant when compared to other causes [10, 11, 12]. In both government and private tertiary care institutions, several writers have identified direct and indirect reasons for maternal mortality rates. Hemorrhage (29.4%), eclampsia (16.13%), and a ruptured uterus (8.6%) were the most prevalent reasons in our research. PPH (27%) is the most common cause of maternal mortality in Pakistan, according to the Pakistan Demographic and Health Survey (2006-2007), followed by puerperal sepsis (13.7%) and eclampsia (10.4%). According to other research, hemorrhage, eclampsia, and sepsis are the leading causes of maternal mortality [13, 14, 15]. The most prevalent cause of MM has been identified as hemorrhage particularly postpartum hemorrhage and as complication of cesarean section like placenta accreta [16]. Indirect causes were found in 24.73 % of the cases in our investigation. According to the Pakistan Demographic and Health Survey, indirect factors account for 13% of maternal fatalities in Pakistan. Cardiomyopathy (14 %), hepatic encephalopathy (12 %), and pulmonary embolism (11 %) were shown to be indirect causes of maternal fatalities by Soomro S, et al (6 %). In our study, women aged 26-30 years had a higher risk of maternal death (40.50 %), followed by women aged 15-25 years (25.10 %). Mothers in the 30–35-year age group had a higher risk of dying, according to Dior, et al. According to Manor et al, maternal fatalities make up the bulk (61.5 percent) occur in women over the age of 30 [17]. According to Iftikhar R's research, the average age of mothers who died as a result of pregnancy-related causes was 30.5 years. MMR levels were greatest in the elderly and lowest in women aged decreases in MMR, according to the Global Burden of Disease Study 2013. MMR changed at a pace of more than 1% every year. Between 2003 and 2013, peaking at –3.3% in 2012–13. We were unable to calculate MMR because live births were not included in our study. According to a 2014 Indian study 27, the greatest MMR (397, 95 percent CI 385–410) was seen in rural regions of impoverished states. While urban areas of richer states had the lowest MMR (115, 95 percent CI 85–146). The most common cause of death was obstetric hemorrhage (38%) was the most common complication, followed by sepsis (11%), obstructed labor (5%), and hypertensive disorders (4%) [18]. Similar findings were found in our study, indicating that hemorrhage contribute most common primary cause of maternal mortality.

Limitations: Our study has a limitation in that it only looked at trends in maternal mortality over three years. To demonstrate a real trend over time, it should have been more like 10-20 years. This is a topic that should be the subject of future investigation. Because we only used one city, our findings cannot be generalized. Another limitation was that we didn't account for parity and live births, so we couldn't draw a link between parity and maternal death or calculate the maternal mortality ratio.

CONCLUSION

Primary causes of maternal death in our area include hemorrhage, ruptured uterus, eclampsia, and sepsis. Maternal fatalities are more common in the age categories of 26 to 30 years old and 15 to 25 years old. These factors are both predictable and avoidable. Maternal mortality is critical, significant, and avoidable; it may be decreased by providing professional care, managing complications promptly, properly training LHV's and TBAs, and raising community awareness.

Recommendations: Focusing treatments like birth attendant training, monitoring, and supervision for oxytocic delivery on particular groups of pregnant women will go a long way toward reducing maternal mortality due to direct, accessible causes.

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