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Original article

Maternal Mortality At A Tertiary Care Teaching Hospital in South India: 10 Year Retrospective Study

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ABSTRACT

Introduction: Pregnancy is not a disease and childbirth is a universally celebrated event. Yet for thousands of women the outcome is not favourable and many end up even losing their lives. The tragedy is that a large number of these deaths are preventable.MMR is a sensitive index that reflects the quality of reproductive care provided to the pregnant woman. **Materials and methods:** This is a retrospective study where medical records of all maternal deaths that have occurred in the last 10 years between January 2005 and December 2014 were reviewed. **Results:** MMR of present study is 144.86/1,00,000 live births. Leading causes of death were haemorrhage (26.19%),toxemia(21.43%) and sepsis(14.3%). Maximum deaths occurred in the age group 21-30(64.29%). Most deaths were in unbooked patients referred from outside. Most women died within 24 hours of admission. 52.38% were multigravids and 78.6% hailed from rural areas. **Conclusion:** MMR in our study remains lower than the current MMR in India, with haemorrhage, toxemia and sepsis leading the causes for maternal deaths.

KEYWORDS: MMR, Maternal mortality

INTRODUCTION

According to 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. [1]

Maternal mortality is defined internationally, as maternal death rate per 1,00,000 live births. India is among those countries which has a very high MMR. The current MMR in India is 212/1,00,000 live births [2] which is far above the desired figure of 100/1,00,000 live births as per the objective of Millenium Development Goals. [1]

Maternal death deprives the surviving infant of mothers care and has serious implications on the family and society. Maternal mortality is an index of effectiveness of obstetric services prevailing in a country. Prevention of maternal deaths should be the foremost goal in the safe motherhood programs in a developing country as ours. Bearing this in mind a maternal death audit was conducted in a tertiary care centre, Fr. Muller Medical College, Mangalore, to find out avoidable/unavoidable factors in each death and use this information to reduce maternal mortality and initiate corrective measures.

MATERIALS AND METHODS

The present study is a retrospective hospital based study which was carried out in the Department of Obstetrics and Gynaecology of Father Muller Medical College Hospital, Mangalore. The hospital records of all maternal deaths occurring between January 2005 and December 2014 were reviewed with respect to age, parity, booking status, delivery status, socio-economic status, admission-death interval and cause of death. The ethical committee of the institute had approved of the study. Results were analyzed by using percentage and proportion.

RESULTS

In the present study, there were 42 maternal deaths amongst 28,994 live births giving an MMR of 144.86 per 1,00,000 live births .MMR ranged from 37.07 in 2005 to 302.37 in 2010.(Table 1)

Table 1: Year wise distribution of deliveries and maternal deaths

Year	Live Births	Maternal Deaths	MMR/1,00,000 Live Births
2005	2697	1	37.07
2006	2689	2	74.37
2007	2940	6	204.08
2008	3070	2	65.14
2009	3206	4	124.76
2010	2315	7	302.37
2011	2809	7	249
2012	2983	7	235
2013	3076	4	130.03
2014	3209	2	62.32
Total	28,994	42	144.86

It is observed that out of 42 maternal deaths, 27(64.29%) were in the age group 21-30 years followed by 13(30.96%) in age group>31 years. Only 2 deaths occurred in <20 years age group(Table 2). 78.6%(33) patients were from rural areas while 9 patients(21.4%) hailed from urban areas.

Table 2: Distribution of maternal deaths according to socio-demographic characteristics

Socio-Demographic Characteristics	Number Of Maternal Deaths	Percentage
Age		
<20 Years	2	4.76%
21-30 Years	27	64.29%
> 31 Years	13	30.96%
Area of residence		
Rural	33	78.6%
Urban	9	21.4%

Out of 42 maternal deaths 11(26.2%) had a booked status while 31(73.8%) were unbooked. (Table 3) By parity,50%(21) patients were multiparous, 19 patients(45.24%) were primiparous. There was 1 grand multi and 1 primigravid. Maximum women 18(42.86%) were delivered by LSCS.13 patients (30.96%) had a normal vaginal delivery, 3 (7.14% had an instrumental vaginal delivery. 1 woman died following a ruptured ectopic pregnancy, 1 following a molar pregnancy, 2 following abortions , while 4 remained undelivered. 80.95% women died postnatally, while 19.05% died antenatally. 35.7%(15) women died within 1 day of admission , 7 women (16.67%) within 2 days of admission, 4 women (9.52%) within 3 days of admission and 38.1%(16) women survived beyond 3 days of admission.

Amongst the direct causes, 26.2% (11) deaths were due to haemorrhage (Table 4). Pre eclampsia and related complications like eclampsia, HELLP syndrome accounted for 9(21.43%) deaths. Septicemia accounted for 6 deaths (14.3%) of which 5 were due to puerperal sepsis and 1 post abortal sepsis. 2 women (4.76%) died of suspected amniotic fluid embolism,1 following ruptured ectopic pregnancy leading to hypovolemic shock and 1 following complications of molar pregnancy. Amongst the indirect causes, cardiac diseases accounted for 4(9.52%) deaths, pneumonia and ARDS for 3 (7.14%) deaths. 3 women (7.14%) died from CNS diseases, 1 following hepatic encephalopathy and 1 from dengue.

Table 3: Distribution of maternal deaths by delivery related characteristics

Variables	Number of Maternal Deaths	Percentage
Antenatal Registration		
Booked	11	26.2%
Referred	31	73.8%
Parity		
Nulligravid	1	2.38%
Primipara	19	45.24%
Multipara	21	50%
Grand Multipara	1	2.38%
Mode of Delivery		
Normal Vaginal Delivery	13	30.96%
Instrumental Delivery	3	7.14%
LSCS	18	42.86%
Undelivered	4	9.52%
MTP/Abortion	2	4.8%
Molar/Ectopic Pregnancy	2(1+1)	4.8%
Admission-Death Interval		
<24 Hours	15	35.7%
24-48 Hours	7	16.7%
48-72 Hours	4	9.5%
>72 Hours	16	38.1%

Table 4: Causes of maternal deaths.

Direct Causes		
Antepartum haemorrhage	1	2.4%
Postpartum haemorrhage	10	23.8%
Toxemia of Pregnancy and Related Complications	9	21.43%
Sepsis		
Puerperal	5	11.9%
Post abortal	1	2.4%
Embolism	2	4.76%
Ectopic Pregnancy	1	2.4%
Molar Pregnancy	1	2.4%
Indirect Causes		
Cardiac Diseases	4	9.52%
Pneumonia/Adult respiratory distress syndrome	3	7.14%
Unrelated Causes		
CNS Diseases	3	7.14%
Infections	1	2.4%
Hepatic encephalopathy	1	2.4%

DISCUSSION

In the present study, there were 42 maternal deaths over 10 years amongst 28,994 live births giving an MMR of 144.86 per 1,00,000 live births, which is lower than the National MMR of 212 per 1,00,000 live births. Other similar studies from tertiary care institutions reported varying MMR; VB Bangal et al [3] at 302.9/1,00,000 live births, Purandare et al [4] at 113/1,00,000 live births, Verma Ashok et al [5] at 345.9/1,00,000 live births , Jadhav Asha et al [6] at 32/1,00,000 live births, Nishu Priya et al [7] at 270/1,00,000 live births.

With the prevailing custom of early marriage in rural area, majority women present with their marriage in the age group of 21-30 years. As shown in Table 2, our study showed that 64.29% of maternal deaths were among age group 21-30 years,similar to that reported by VB Bangal et al [3] at 68.42%, Kaur et al [8] at51.8%, Verma Ashok et al [5] at 78.5% .

78.6% women belonged to rural background with 21.4% from urban background, comparable to study by Nishu Priya et al [7] where 89.6% hailed from rural background. Poverty and female illiteracy are important social risk factors which are closely interlinked with maternal health. 73.8% maternal deaths were amongst women referred from outside hospitals. This is in agreement with other studies, VB Bangal et al[3] reported 71.06% deaths among referred patients, Jadhav CA et al 78.48% [9] and Verma Ashok et al [5] 80% amongst referred patients.

In our study, multigravidas comprised 52.38% which was inclusive of 1 grand multipara. This is comparable to studies by Jadhav CA et al [9] at 50.64%, VB Bangal et al [3] at 57.89%, Thomas et al [10] at 50.8%. Too many and too close pregnancies adversely affect the health of the mother and have its roots in the social status of the woman.

As shown in Table 3, post natal death rate was 80.95% and included 38.1% after vaginal delivery and 42.86% after LSCS. In studies by Purandare et al [4] and Arpita N et al [11] , a post natal death rate of 73.33% was observed. 35.7% of deaths occurred within 24 hours of admission , 16.7% between 1-2days ,9.5% within 2-3 days and 38.1% beyond 72hours of admission, similar to that reported by other studies, Nishu Priya et al [7] reported 54.63% deaths within 24hours of admission, Verma Ashok et al [5] reported 46.15% deaths within first day of admission, Jadhav CA et al [9] 46.83%.In the study by VB Bangal et al [3], 39.5% died within 24 hours of admission and 25.06% after 7 days of admission.

In the present study, common direct causes of maternal mortality were haemorrhage(26.2%), toxemia of pregnancy and related causes (21.43%) and sepsis (14.3%). Other studies showed similar results. Amongst indirect causes, in the present study, cardiac diseases accounted for 9.52% deaths and pulmonary causes for 7.14%, similar to that reported by VB Bangal et al [3] 13.15% deaths due to cardiac causes and 7.6% due to pulmonary causes and Jadhav CA et al [9] 10.75% deaths due to cardiac diseases and 1.26% due to pulmonary causes .

Table 5: Comparative analysis of direct causes of maternal mortality

Authors	MMR	Haemorrhage	Toxemia	Sepsis
VB Bangal et al [3]	302.6	21.05%	10.52%	10.52%
Verma Ashok et al [5]	345.9	21.8%	20%	21.6%
Arpita N et al [11]	555.5	31.9%	24.2%	7.24%
Jadhav CA et al [9]	395	27.84%	10.75%	3.16%
Present study	144.86	26.2%	21.43%	14.3%

CONCLUSION

Maternal mortality ratio in our study is lower than the national averages. The classical triad of maternal mortality in our study remains as haemorrhage, toxemia and sepsis. The majority of maternal deaths continue to occur among the unbooked patients and those hailing from rural areas.

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