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Original Research Article.

Analysis of Maternal Mortality: A Retrospective Study at Tertiary care Centre

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ABSTRACT

Background: Mother is the pillar of the family and maternal deaths during pregnancy and delivery are great loss to baby, family, society and country too. Maternal mortality is an indicator of the quality of obstetric care in a community directly reflecting the utilization of health care services available.

Aims and Objectives: The aim is to study the incidence of maternal mortality, to assess the epidemiological aspects, causes of maternal mortality and avoidable factors that can prevent maternal deaths.

Method: A retrospective study was done at Rangpur Medical College Hospital from January 2018 to December 2018.

Results: A total of 49 deaths were analyzed. Maximum maternal deaths were reported in the age group of 20-30 years which was 67.34%. More deaths were among multiparous women which was 24.48% as compared to primipara 6.12%. Deaths among multigravida was 38.77% which was also more than primigravida 30.61%. Majority of women 91.83% were housewives and 8.16% women were service holder. Most of them were unbooked cases 63.26%. Among them 59.18% belong to rural area 46.8% belongs to urbane area. Most maternal deaths were due to obstetric causes like postpartum haemorrhage 44.89%, Eclampsia 32.65%, antepartum haemorrhage 6.12%, ruptured uterus 2.04%, puerperal sepsis 2.04%, severe pre eclampsia 2.04%. Associated co-morbid factors were AKI with DIC due to IUFD 2.04%, AKI with hepatic encephalopathy 2.04%, Anaemic heart failure with AKI 2.04%, Encephalitis 2.04%, IFUD with 53% mixed type flame burn 2.04%.

Conclusion: Maternal mortality even today is a preventable tragedy by giving proper antenatal care, early referral, quick efficient transport facilities, continued skill based training, up-gradation of hospitals, setting up a system of audit and monitoring of health services can reduce maternal mortality.

Key words: Antenatal, Hemorrhage, Hypertensive Disorders, Maternal Mortality.

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INTRODUCTION

Pregnancy and childhood are joyful events but sometimes may land up with complications and death if risk factors are not identified and corrected at proper time. Death of a women and mother is tragic loss to child, community and nation as a whole.

Every minute there is one maternal death all over the world.Almost half of a million women die every year from the complications during pregnancy and childbirth. About 99% of these women are from developing world with over 90% of these women are concentrated in Africa and Asia.[1] Maternal mortality is defined as maternal death per 1,00,000 live births. Maternal mortality is an indicator of the quality of obstetric care in a community, directly reflecting the utilization of health care services available.[2]

Between Bangladesh maternal mortality and health care survey (BMMS) 2001 and 2010 MMR declined significantly from 322 to 194 maternal deaths per 100,000 live births in Bangladesh but the MMR estimate from the BMMS 2016 is 196 maternal deaths per 100,000 live birth.

C-section delivery rates in Bangladesh now greatly exceed the levels expected to be medically necessary. Almost 1 milion C-section are performed each year in Bangladesh out of which 79 percent are occurring in private health facilities. Increased C-section related morbidity or mortality have been confirmed by multicenter study of 100,000 births in Latin America. BMMS 2016. WHO suggests that a reasonable rate of medically necessary C-section is between 10 percent and 15 percent of all births. In

Bangladesh, the C-section rate is twice as high (31 percent) as the WHO recommended rate.[3]

According to the tenth revision of the international classification of disease (ICD-10) ``a maternal death is defined as death of a women 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 managements''(ICD-10). According to the WHO, 80 of maternal death in developing countries are due to direct maternal causes such as haemorrhage, hypertensive disorders and sepsis. Remaining 20 of maternal death are due to indirect causes such as HIV/AIDS, cardiac disease, hepatic diseases and anemia.[4]

These deaths are largely preventable. The time needed to receive adequate care is the most significant contributor to maternal mortality. There are three phases of delay. The first delay is failure of a patient to seek appropriate antenatal care. The second delay is reaching an adequate health care facility. The third delay in receiving health care at the facility, including delay in referral.[5]

This study was carried out at Rangpur Medical College Hospital which is a tertiary level hospital from January 2018 to December 2018 to study the incidence of maternal mortality, assess the epidemiological aspects, causes of maternal mortality and avoidable factors that can prevent maternal deaths.

MATERIALS AND METHODS

A retrospective hospital based study was carried out in obstetrics and gynaecology department of Rangpur Medical College Hospital – a rural tertiary level heath care referral centre in Bangladesh, over a period of one year from January 2018 to December 2018. A total 49 maternal deaths were analyzed with the special emphasis on sociodemographic profile of the patient, parity, cause of death, time interval from admission to death and trimester of pregnancy at the time of death. Data were processed by using computer program SPSS.Results were analyzed by using percentage and test of proportion was done for statistical analysis.

RESULTS

During the period of study total no, of admitted patients were 6236. Among them antenatal cases were 4816 and postnatal cases1420. Number of vaginal delivery was 2442 and total number of LSCS was 1328. Thus, the percentage of vaginal delivery was 64.77% and percentage of LSCS was 35.22%.

Total number of maternal deaths was 49 and total number of live births was 3539 cases giving the MMR of 1384 per 100,000 live births.

A total 49 deaths were analyzed. Maximum maternal deaths were reported in the age of group of 20-30 years which was 67.34% (Table 1, p< 0.001). Deaths among multiparous women were 24.48% as compared with primipara were 6.12% (Table 6, P< 0.001). Deaths among multigravida were 38.77% which is also more than primigravida which were 30.61% (Table 7, P< 0.05). Most of them were unbooked cases 63.26%. among them 59.18% belong to rural area and 46.8% belong to urban area (Table 3, P< 0.05).

Most maternal deaths were due to obstetric causes like postpartum haemorrhage 44.89%, eclampsia 32.65%, antepartum hemorrhage 6.12% (Table 10, P< 0.001). Other less common causes includes ruptured uterus 2.04%, puerperal sepsis 2.04% and severe preeclampsia 2.04% (Table 10).Among the indirect causes of maternal deaths anemia is one of the comorbid factors. Other indirect causes of deaths are AKI (2.04%), encephalitis (2.04%), hepatic encephalopathy 2.04%, DIC 2.04%, mixed type 53% flame burn 2.04% (Table 10).

Table 1: Age distribution of the study subjects

Age (Years)	n	%	P value
<20	05	10.20%	
20-30	33	67.34%	<0.001
>30	11	22.44%	

Table 2: Educational status of the study subjects

Educational status	n	%	P value
Illiterate	08	16.32%	
Primary	21	42.85%	<0.001
SSC	17	34.69%	
HSC	03	6.12%	

Table 3: Residence of the study subjects

Residence	n	%	P value
Urban	20	40.82%	<0.05
Rural	29	59.18%	

Table 4: Socio economic status of the study subjects

Socioeconomic status	n	%	P value
Low	25	51.02%	
Middle	24	48.97%	<0.001
High	00	00%	

Table 5: Occupation of the study subjects

Occupation	n	%	P value
House wife	45	91.83%	<0.001
Service Holder	4	8.16%	

Table 6: Percentage of para of the study subjects

Para	n	%	P value
Primi	03	6.12%	<0.001
Multi	12	24.48%	

Table 7: Percentage of gravida of the study subjects

Gravida	n	%	P value
Primi	15	30.61%	<0.05
Multi	19	38.77%	

Table 8: Gestational age of the study subjects

Gestational age	n	%
>28-32 weeks	8	16.32%
33-36 weeks	11	22.44%
>36 weeks	15	30.61%

Table 9: Percentage of antenatal check up of the study subjects

ANC	n	%	P value
Yes	18	36.73%	<0.001
No	31	63.26%	

Table 10: Causes of death of the study subjects

No.	Causes of deaths	n	%	P value
1	Haemorrhage	25	51.02%	
	i)Postpartum haemorrhage	22	44.89%	
	ii)Antepartum Haemorrhage	03	6.122%	
2	Hypertensive Disorders	17	34.69%	
	i)Eclampsia	16	32.65%	<0.001
	ii) Severe Pre eclampsia	01	2.04%	
3	12th day of abnormal puerperium with AKI with sepsis	01	2.04%	
4	2nd G with 33 weeks pregnancy with IUFD with 53% mixed type flam burn with hypovolemic shock	01	2.04%	
5	2ndG with 38 weeks pregnancy with encephalitis	01	2.04%	
6	2nd G with Anaemic heart failure with AKI	01	2.04%	
7	Severe anaemia due to internal haemorrhage due to ruptured uterus	01	2.04%	
8	Hepatic encephalopathy with AKI	01	2.04%	
9	2nd G with 37 weeks pregnancy with AKI with DIC with IUFD	01	2.04%	

Table 11: Co morbid factors of the study subjects

Co- morbid factors	n	%
HTN	03	6.12%
DM	01	2.04%
Heart disease	01	2.04%

Table 12: Admission death interval

Admission death interval	Total number of death	%
<24 hours	41	83.67%
24 hours to 7 days	08	16.32%

DISCUSSION

Averting maternal deaths remains a challenge to health care system in Bangladesh as well as to the developing countries. Maternal mortality is an indicator of the quality of obstetric care in a community, directly reflecting the utilization of health care services available. High incidence of maternal death reflects poor quality of maternal health services.[1,2]

Between Bangladesh maternal mortality and health care survey (BMMS) 2001 and 2010 MMR declined significantly from 322 to 194 maternal deaths per 100,000 live births in Bangladesh but the MMR estimate from the BMMS 2016 is 196 maternal deaths per 100,000 live birth.[3]

In the present study there were 49 maternal deaths among 3539 deliveries giving the MMR of 1384 per 100,000 live birth which is higher than national averages which could be due to the fact, that our hospital is a tertiary care centre and receives a lot of complicated referral from North Bengal and rural areas at a very late stage.

This study was compared to other studies from home and abroad. There is wide variation in MMR. However maternal mortality rate of any hospital and that too of an apex hospital cannot be a true representative of that area. A study of Madhu Jain from India reported MMR of 2269.40 per 100,000 live births, SA Tazri has reported MMR 700 per 100,000 live births.[6,7]

The classic triad of haemorrhage, hypertensive disorders and sepsis were the major causes of maternal deaths. In our study haemorrhage (51.02%) was the leading cause of maternal death followed by hypertensive disorder (32.65%) and sepsis (2.04%) (Table 10, p<0.001) which is also consistent with study of Usha doddamani and Ashim Roy. Among haemorrhage primary postpartum haemorrhage is most common obstetric haemorrhage causing maternal mortality and morbidity.[8,9]

Among the indirect cause of maternal death anaemia is the leading co-morbid factor which was comparable to other study. [10] Other indirect causes of death are AKI (2.04%), encephalitis (2.04%), 53% mixed type flame burn (2.04%), hepatic encephalopathy (2.04%), DIC (2.04%) and heart disease (2.04%); which is also consistent with other study results.[10]

The percentage of deaths due to anaemia is grossly underestimated figure because preexisting anaemia is a major contributing factor of direct obstetrical deaths due to PPH and sepsis, which is also consistent with study by Aparna R.[10]

Highest number of the patient died among the age group of 20-30 years which is consistent with Aparna R.[10]

Death in multipara and multigravida is 63.25% (Table 6, 7 p<0.001) which is consistent with Aparna R.[10]

Repeated pregnancies with a short interval of time, lack of prophylactic iron therapy during pregnancy, poor diet and above all prolonged lactation are predisposing factors for anaemia.[10,11]

In our study more deaths were among the mothers of rural areas and urban areas were 59.18% and 40.82% respectively (Table 3, p<0.001). Admission – death interval analysis of our study reveals that 83.67% of women died within 24 hours of admission (table 12, p<0.001) possibly due to poor general condition of women on admission, late referral and at times due to a long travel time from neighboring districts[2,4,7,8], which is also consistent with study by Aparna R and Vidyadhar.[10,11] More maternal death belonging to women at low socioeconomic status and middle class were 51.02% and 48.97% respectively and it was 0% in high socioeconomic status (Table 4, p<0.001) . Low income per head has its direct impact on MMR in terms of nutritional status, affordability and accessibility to quality health care system, which is consistent with the study by Vidyadhar and konar Hiral.[11,12]

Higher mortality was seen in illiterate and women having only primary education 59.17% (Table 2, p<0.05). Improved literacy rate of women is strongly correlated with decline in MMR, which is also consistent with study by Konar Hiralal.[12]

Among 17 goals of SDG's to ensure healthy lives and promote well being for all at all ages and target is by 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births.

The MMR in Bangladesh declined between 2001 to 2010 but has now stalled. The MMR estimate from the BMMS 2016 is 196 maternal deaths per 100,000 live births, almost identical to the estimate of BMMS 2010.

Bangladesh is not the only country that has experienced increased utilization of maternal services with no impact on MMR.

An analysis of 37 countries in sub-saharan Africa (SSA) and south and southeast Asia (SSEA) found a weak association between MMR and the percentage of deliveries occurring in health facility. These data suggest that increasing facility delivery is important but not sufficient to lower MMR.

The quality of health care is generally poor in Bangladesh. Finding for other studies – including the Bangladesh health facilities survey, 2014 – show substantial deficiencies in the readiness of both public and private health facilities to provide high quality maternity care.

CONCLUSION

Maternal mortality is a preventable tragedy. There is gradual improvement in the process and impact indicators of maternal health; however a long way has yet to cross to reduce MMR to an acceptable level. To accelerate the current success, Bangladesh need to implement evidence-based continuum of care from family and community to PHC and referral level facilities with short and long term strategies to address distant and proximal influences of maternal death. Assurance of skilled birth attendance is a high priority to reduce MMR. At the same time community should be mobilized for female education and women's right to quality maternal services. Structured antenatal care service should be ensured. Access to cEmOC facilities should be prioritized, early referral, easy transport, continued skill based training, up gradation of hospitals, monitoring of health services can reduce maternal mortality.

PPH should be encountered as high priority and a national guideline to prevent and manage PPH should be in place. Bangladesh needs to extend its current collaborate approach involving government sectors, NGOs, doctors and community to reduce MMR.

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