

A Retrospective study of maternal mortality rate at tertiary care teaching hospital in rural India

M Vijayasree

Department of OBG, Mamata General Hospital, Khammam, Andhra Pradesh,

Abstract

Back ground : Pregnancy, although being considered a physiological state, carries risk of serious maternal morbidity and at times mortality. This is due to various complications that may occur during pregnancy, labor or thereafter. Maternal death has serious implications on the family, the society and the nation. Maternal Mortality Ratio (MMR) is a very sensitive index that reflects the quality of reproductive care provided to the pregnant women.

Aims and Objectives: To assess the maternal mortality ratio and the causes of maternal death over a period of five years at a tertiary care teaching hospital of rural India.

Materials and Methods: A retrospective hospital based study of 38 maternal deaths over a period of 5 years from January 2008 to December 2012. The information regarding demographic profile and reproductive parameters were collected and results were analyzed by using percentage and proportion.

Results: Over the study period, there were 12,544 deliveries, giving a MMR of 302.9/1,00,000 live births. Postpartum hemorrhage was the leading direct cause while infective hepatitis was indirect leading cause. Most of the women died within 24 hours of admission. The age group of 19 to 24 years was mainly affected.

Conclusions: Most maternal deaths were preventable by optimum utilization of existing MCH facilities, identifying the problems in health care delivery system, early identification of high risk pregnancies and their timely referral to tertiary care center.

Key Words: Maternal mortality, Postpartum hemorrhage, Hepatitis, Rural India.

Introduction

Pregnancy, although being considered a physiological state, carries risk of serious maternal morbidity and at times mortality. This is due to various complications that may occur during pregnancy, labor or thereafter. Maternal death has serious implications on the family, the society and the nation. Maternal Mortality Ratio (MMR) is a very sensitive index that reflects the quality of reproductive care provided to the pregnant women. Maternal mortality is defined as the death of any woman while being pregnant or within 42 completed days after termination of pregnancy, irrespective of the duration or site of pregnancy, from any cause related to or aggravated by pregnancy, but not from accidental or incidental causes [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 maternal mortality ratio. Maternal mortality ratio was 2000 per 1,00,000 live births in 1938, which declined to 1000 per 1,00,000 live births by 1959; it dropped down to 540 per 1,00,000 live births in 1999 [2]. Currently it is estimated to be 254 per 1,00,000 live births, which is far above the desired figure of 100 per 1,00,000 live births as per the objectives of Millennium Development Goals (MDGs). A population based survey carried out in India, which used longitudinal surveillance and complete coverage of vital events, reported a MMR of 320 per 1,00,000 live births in rural areas [3]. Pregnancy, although being considered a normal healthy state, carries serious risk of morbidity and at times mortality [4]. Maternal death has serious implications to the family, the society and the nation. It deprives the surviving infant of mother's care. One of the most important goals of the MDGs is to reduce the maternal mortality. Hence this present

Address for Correspondence

Dr. Vijayasree Professor of OBG, Mamata General Hospital
Khammam-507001, Andhra Pradesh
E-mail:-hospitalstelangana@gmail.com

study was conducted to review the existing maternal mortality ratio and the causes of maternal death at a tertiary care teaching hospital of rural India, so that corrective steps can be taken to reach the goal within the stipulated time frame.

Materials and Methods

A retrospective hospital based study was carried out in the Obstetrics and Gynecology Department in mamata medical college - a rural tertiary level health care referral centre in khammam, Andhra pradesh, India over a period of 5 years from January 2008 to December 2012. A total 38 maternal deaths were analyzed with the special emphasis on socio-demographic profile of the patient, parity, cause of death, time interval from admission to death, and trimester of pregnancy at the time of death. The ethical committee of the institute had approved the study. Results were analyzed by using percentage and proportion.

Results

It is observed from (Table - 1), that out of total 38 deaths, 21 (55.27%) were in the age group of 19-24 years followed by 6 (15.79%) deaths in <19 years and over the age of 30 years. According to B.G. Prasad's Classification[5], majority of maternal deaths (78.95%) belonged to lower class, followed by

(21.05%) from the upper class. By occupation, (47.36%) maternal deaths were seen in landless labourers followed by (36.84%) in household workers. Majority (57.90%) were illiterate and only (21.05%) had studied upto primary and secondary level. Among the total 38 deaths, 1 (2.63%) women died within 1 hour of admission; 6 (15.79%) between 2-12 hours of admission; and 8 (21.05%) between 13-24 hours of admission and 9 (25.06%) after 7 days of admission. Maximum deaths (64.51%) have occurred who delivered at tertiary care centre. Majority (39.47%) deaths occurred in the 3rd trimester; followed by (31.57%) in the post-partum period and (23.68%) in the 2nd trimester. As of the 38 deaths, 11 (28.94%) had booked status and 27 (71.06%) had unbooked status. By parity, 16 (42.10%) were primigravidas and 22 (57.89%) were multigravidas. (Table – 2). As evident from (Table – 3), both direct and indirect causes contributed to (50%) of maternal deaths. Amongst the direct causes, 8 (21.05%) were due to hemorrhage. Eclampsia and embolism were responsible for 4 (10.52%) deaths. Septicemia accounted for 7.89% of the deaths. Amongst the indirect causes, hepatitis accounted for 8 (21.05%) deaths; heart disease for 5 (13.15%) deaths; cerebral malaria for 3 (7.89%) deaths, viral encephalitis for 2 (5.26%) deaths and anemia for 1 (2.63%) death.

Table 1. Distribution of Maternal Deaths According to Socio Demographic Characteristics (n=38)

Socio-demographic characteristics	No. of maternal deaths	Percentage
Age		
<19yrs	06	15.79
19-24 yrs	21	55.27
25-29yrs	05	13.15
30-34yrs	02	5.27
>34yrs	04	10.52
Area of residence		
Urban	00	00.00
Rural	38	100.00
Socio-economic status		
Upper (I)	00	00.00
Upper middle (II)	00	00.00
Lower middle (III)	00	00.00
Upper lower (IV)	08	21.05
Lower(V)	30	78.95
Occupation		
Landless labourers	18	47.36
Cultivators	04	10.52
House hold work	14	36.84
Service	02	5.26
Education		
Illiterate	22	57.9
Primary education	08	21.05
Secondary education	08	21.05
Higher secondary education	00	00.00

Table 2. Distribution of Material Deaths by Delivery Related Characteristics

Variables	No.of maternal deaths	Percentage
Time interval from admission to death	(n=38)	
0-1hrs	01	2.63
2-12hrs	06	15.79
13-24hrs	08	21.05
25-165hrs	14	34.21
7days and above	09	23.68
Place of delivery	(n=31)	
Tertiary care centre	20	64.51
Private nursing home	07	22.50
Home	03	9.67
PHC/RHC	01	3.22
Govt. Hospital	00	00.00
Delivery status	(n=38)	
Delivered	31	81.57
Un-delivered	06	15.78
Abortion	01	2.63
Stage of pregnancy at the time of death	(n=38)	
1 st trimester	02	5.26
2 nd trimester	09	23.68
3 rd trimester	15	39.47
Post-partum	12	31.57
Parity	(n=38)	
Primigravidas	16	42.10
Multigravidas (2-4)	21	55.26
Grand multis (>5)	01	2.63
Antenatal registration	(n=38)	
Registered (booked)	11	28.94
Un-registered (un- booked)	27	71.06

Table 3. Causes of Material Deaths (n= 38)

Causes of deaths	No.of maternal deaths	Percentage
Direct cause	(n=19)	50.00
1. Hemorrhage	08	21.05
2. Eclampsia	04	10.52
3. Embolism	04	10.52
4. Sepsis	03	7.89
Indirect causes	(n=19)	50.00
1. Hepatitis	08	21.05
2. Heart disease	05	13.15
3. Cerebral malaria	03	7.89
4. Viral encephalitis	02	5.26
5. Anemia	01	2.63

Discussion

Death of mother is a tragic event. In practical life, it has a severe impact on the family, community and eventually, the nation. The young surviving children left motherless are unable to cope with daily living and are at an increased risk of death. Reduction of maternal mortality is the objective of MDGs, especially in low income countries, where one in 16 women die of pregnancy related complications⁶. In the present study, there were 38 maternal deaths amongst 12,544 deliveries, giving a MMR of 302.9 per 1,00,000 live births, which is higher than the national averages. Mamata general Hospital, khammam, being a teaching institution and a tertiary care centre, get complicated cases from rural areas. Admissions of moribund cases referred from periphery have inflated this mortality ratio, like any other teaching institutions of India. Other similar studies from tertiary care institution reported MMR ranged between 213 to 879 per 1,00,000 live births [7,8,9,10,11,12,13,14]. With the prevailing custom of early marriage in rural area, majority women present with their pregnancy in the age group of 19-24 years. In the present study, Maximum deaths (55.27%) were in the age group of 19-24 years, followed by (15.79%) deaths in <19 years & over the age of 30 years, similar to that reported by the other studies, Kaur et al¹⁵ revealed that 51.8% of deaths in 20-30 years, 19.6% in teenage pregnancies and 23.3% in >30 years; Taneja P¹⁶ showed that 78% of deaths in 20-30 years; Sengupta et al, observed that 61% of deaths in 20-29 years, 28.62% of deaths in >30 years and only 9.94% deaths in <19 years; Agarwal et al¹⁷ noticed that 50% deaths in 20-25 years, 27% in 26-30 years, 12% in <19 years; Sikdar et al¹⁸ reported that 23.5% deaths in <20 years; 54.5% in 21-30 years, 18.5% in >30 years, Dogra et al¹⁹ revealed that 48% deaths in 20-25 years while 10.3% in >30 years. The reduction in the number of deaths in women <19 years of age is partly due to liberalization of abortion. Due to law (MTP Act), many young women seek help from specialist doctors for legal abortions, thus reducing the number of criminal abortions and subsequently the deaths associated with its complications. In the present study, out of the 38 deaths, 16 (42.10%) deaths were among primigravidas and 22 (57.89%) among

multigravidas, similar to that reported by the other studies, Agarwal et al, reported that high deaths among multiparas (43%) than the primiparas (25%); Sikdar et al revealed that (25.5%) deaths in primigravidas and (74.5%) in multigravidas; Thomas et al²⁰ showed that primigravida contributing to 29.2% and multigravida 50.8% of deaths. Purandare et al²¹ observed that out of the 30 deaths, 21 were multigravida and 9 were primigravidas. Too many and too close pregnancies together adversely affect the mother's health. In the present study, one women died within one hour of admission; 6 (15.79%) between 2-12 hours of admission; and 8 (21.05%) between 13-24 hours of admission and 9 (25.06%) after 7 days of admission. Similar to that reported by the other studies, Sikdar et al reported that 48 (19.7%) died within first 12 hours of admission and another 30 (12.5%) died within next 12 hours; 78 (32.2%) died within 1 day, 58 (23.8%) died within 1-3 days, 39 (16%) died in between 4 to 7 days. Agarwal et al revealed that 44% died within 24 hours of admission and 22% within 12 hours of hospital stay; Purandare et al showed that among the 30 deaths, 3 died within 30 minutes of admission, 14 died between 30 minutes and 6 hours, 7 died between 6 and 24 hours and remaining 6 died after 24 hours of admissions. In the present study, maximum (39.47%) deaths occurred in the 3rd trimester; followed by (31.57%) in the post-partum period and (23.68%) in the 2nd trimester. Similar results have been reported by other studies, Purandare et al showed that (73.33%) in the post-partum period followed by (26.66%) during the ante-partum and (3.3%) during intra-partum period. Thomas et al showed that who presented in the 1st, 2nd and 3rd trimester and post natal/ post-abortal were 3.5%, 9.7%, 31.9% and 54.9% respectively. Dongra et al revealed that maximum deaths 86.20% occurred in the 3rd trimester of pregnancy. In the present study, both direct and indirect causes contributed to (50.%) of maternal death. Common direct causes were hemorrhage (21.05%) (post-partum, ante-partum and abortion related hemorrhage), eclampsia and pulmonary embolism (10.52%) and sepsis (7.89%) (Puerperal, ante-partum and intra-partum sepsis) and indirect causes were hepatitis (21.05%), heart disease (13.15%), cerebral malaria (7.89%), and

anaemia (2.63%). Similar to that reported by the other studies, Trivedi et al reported that among indirect leading causes, hepatitis accounting for 29.43% of deaths. Bera et al [22] revealed that among the direct causes, hemorrhage contributed in 23.8% and sepsis for 16.4% deaths and among the indirect causes, jaundice resulted (19.9%), followed by anaemia and heart disease, with 5.9% and 3.4% deaths respectively. Sengupta et al noticed that among the direct causes, haemorrhage (12.40%) and sepsis (17.82%) and among the indirect causes, hepatitis (29.93%) followed by anaemia (17.82%). Purandare et al observed that among the direct causes, hemorrhage in 70.83% of deaths; followed by septicemia (3.3%) and among the indirect causes, anemia in 55.3%; hepatic disorders in 3.3% and pulmonary embolism accounting for 6.67%. Thomas et al noticed that among the direct causes, hemorrhage in 20.15% and sepsis in 17.4% and among the indirect causes, hepatitis in 11.9% followed by (7.6%) pulmonary embolism.

Conclusion

The MMR in our study is higher than the national averages. Most of the deaths could have been avoided with the help of early referral, quick, efficient and well equipped transport facilities, availability of adequate blood and blood components, and by promoting overall safe motherhood. Analysis of every maternal death through maternal death audit, either at community level (verbal autopsy) or at the institutional level should be carried out. It will help in identifying the reasons and deficiencies in health care delivery system that might contribute in causing pregnancy related deaths.

References

1. Park K. Preventive medicine in obstetric, Paediatrics and geriatrics: Park's Text Book of Preventive and Social Medicine. 20th edition. Jabalpur: M/S Banarasi Das Bhanot; 2009. p. 479-483.
2. Govt. of India (1962) Report of the Health survey and Planning Committee, Vol 1. Govt. of India, Ministry of health and Family Welfare (1984)

Annual report 1983-84.

3. Pal Amitava, Prasanta Rai, Hazara Samir, Mondal T K. Review of changing trends in Maternal

Mortality in rural medical College in West Bengal. J. Obstetric Gynaecol India. 2005; 55: 521-

525

4. Berg C. Strategies to prevent pregnancy related deaths: from identification and review to

actions, centre of disease control and prevention, 2001 (<http://www.cdc.govt/reproduction>

health/02_pub_elect.htm).

5. Rao TB. Sociology in Medicine. 1st ed. Guntur: Sree Graphics; 2002. P.76.

6. Gurina NA, Vangen S, Forsen L, Sundby J. Maternal mortality in St. Petersburg, Russian

Federation. Bull World Health Organization. 2006; 84: 283-9.

7. Bedi N, Kambo 1, Ihilion BS et al. Maternal deaths in India: Preventable tragedies (An ICMR

Task free study). J Obst Gynaecol Ind. 2001; 51: 86-92.

8. Purandare N, Singh A, Upadhya S, et al. Maternal mortality at a referral centre: a five year

study. J obstetric Gynaecology India. 2007; 57(3):248-50

9. Kulkarni SR, Huligol A. Maternal Mortality -10 year study. J Obstetric Gynaecol India. 2001;

51(2):73-76.

10. Verma A, Minhas S, Sood A. A study of Maternal Mortality. J. Obstetric

Gynaecol India. 2008; 58: 226-229.

11. Jadhav A, Rote P. Maternal Mortality- changing trends. J. Obstetric Gynaecol

India. 2007; 57: 398-400.

12. Trivedi SS., Goyal U, Gupta U, A study of Maternal Mortality due to viral hepatitis. J. Obstetric Gynaecol India. 2003; 53: 551-553.

13. Sengupta A and Gode AG. The study of maternal mortality and morbidity in a North Indian Hospital, A 9 years Review. J. Obstetric Gynaecol India. 1986;394-400.
14. Bhargava H. Maternal Mortality - A survey of 7 years 1970 to 1976. J. Obstetric Gynaecol India. 1978;28:48-51.
15. Kaur D, Kaur A. A retrospective study of maternal mortality in government medical college. Journal of Obstetrics, Gynaecology and family Welfare. 1999; 5: 18-22.
16. Taneja PV. Maternal Mortality in Madhya Pradesh. J. Obstetric Gynaecol India 2000; 50: 59-61.
17. Aggrawal V. Study of Maternal. Mortality. J. Obstetric Gynaecol India. 1982; 32: 686- 690.
18. Sikdar Kamala and Konar M. Maternal mortality, A 3 year survey in Eden Hospital. J. Obstetric Gynaecol India. 1979; 29: 76-80
19. Dogra Poojan, Gupta K B. A study of maternal mortality at a tertiary institute, Obs. and Gynae. Today. 2009; 115: 58-60.
20. Thomas B., Mhaskar A., Review of maternal mortality at tertiary care hospital of India over ten years, International Journal of Gynecology and Obstetrics India. 2006;9,5:19-21.
21. Purandare NI, Singh A, Upadhyae S, Saraogi R M. Maternal Mortality at a referral centre: a five year study. J. Obstetric Gynaecol India. 2007; 57: 248-250.
22. Bera SK, Sengupta A. Evaluation of etiological factors of maternal deaths in Eden Hospital (Twelve years study)

Source of Support : **Nil**
Conflict of Interest : **None Declared**