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Maternal Mortality At Tertiary Care Hospital In Rajasthan: A 10 - Year Review

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Abstract
Background: *Maternal mortality in India continues to be unacceptably high. This study was done to evaluate the maternal mortality ratio (MMR) in our hospital, to assess the epidemiological aspects and causes of maternal mortality, and to suggest recommendations for improvement.*
Methods: *This study was a 10 year retrospective study from year 2007 to 2016. Data was collected from the hospital record register, epidemiological factors and causes of maternal mortality were assessed. MMR was calculated.*
Results: *Total 348 maternal deaths occurred in 10 years. The mean maternal mortality ratio in the study period was 253.13/100,000 live births. Most maternal deaths occurred in the age group of 21–25 years (47.4%), multiparous women (60.9%), women from rural areas (74.1%), unbooked patients (88.79%), and patients of low socioeconomic status (78.7%). Direct causes accounted for 66.95% of maternal deaths where as 33.045% of maternal deaths were due to indirect causes.*
Conclusion: *Most of the causes of maternal deaths are preventable. Improvement in primary health care in rural areas, proper implementation of NRHM programs and up gradation of hospitals can bring down the number of maternal deaths.*
Keywords: *Maternal mortality ratio, maternal death, prevention, directs obstetric death, indirect obstetric death.*

I. Introduction

According to the World Health Organization (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". Maternal Mortality ratio is the number of maternal deaths during given time period per 100,000 live births during same time period. Maternal Mortality Ratio (MMR) is a very sensitive index that reflects the quality of reproductive care provided to the pregnant women. The current maternal mortality ratio (MMR) in India is 167/100,000 live births [1], whereas MMR of developed countries is 9/100,000 live births.

Direct maternal death is the result of a complication of pregnancy, delivery or management of the pregnancy and delivery. Indirect maternal death is a pregnancy related death in a patient with a pre-existing or newly developed health problem unrelated to pregnancy or non-obstetrical deaths. The causes of maternal mortality vary according to regions. In the developed countries, the main causes are hypertensive disorders, haemorrhage and embolism, whereas, in the developing countries, they are haemorrhage, hypertensive disorders and sepsis. Socio-economic factors like poverty, literacy, child marriage and cast system also play important in maternal mortality. Poor quality of care, unavailability of care, inadequate access to health facilities and delay in seeking healthcare are the main draw backs of our health care system.

This study was conducted to evaluate the maternal mortality ratio in the tertiary health care centre, to evaluate the effect of socio-demographic factors on maternal death, and to know the causes of maternal death so that preventive step can taken to reach goal of Millennium Development Goal (MGD).

Aims And Objectives

1. To calculate the MMR in our hospital.
2. To assess the epidemiological aspects of maternal mortality.
3. To analyze the causes of maternal mortality.

4. To suggest ways to reduce the MMR.

II. Methods

Data were collected for this retrospective study from the hospital records after obtaining permission from the Medical Superintendent of the hospital. The details of maternal deaths that occurred over a period of 10 years from 2007 to 2016 in department of Obstetrics and Gynaecology, at Mahila Chikitsalaya, SMS Medical College, Jaipur were collected.

The collected details of maternal deaths from January 2007 to December 2016 were analyzed with respect to following epidemiological parameters.

- Locality wise distribution of maternal deaths.
- Gravidity wise distribution of maternal deaths.
- Maternal deaths according to receipt of antenatal care.
- Distribution of maternal deaths according to socioeconomic status.
- Causes of maternal deaths.

Descriptive data was tabulated as absolute figures and percentages. The details of number of live births from January 2007 to December 2016 were collected. Maternal mortality ratio for the study period was calculated .Mean maternal mortality ratio for the study period was calculated by calculating the mean of yearly MMR of the entire study period.

III. Results

During the study period, January 2007 to December 2016, total live births were 139,335 and total maternal deaths were 348. The mean maternal mortality ratio in the study period was 253.13/100,000 live births. (Table no.1) Majority of maternal deaths (47.4%) were reported in the age group of 21 to 25 years, came from rural area (74.1%) and were from lower socioeconomic status (78.7%). More deaths were reported in multiparous women (60.9%) as compared to primiparas. Maximum maternal deaths were reported in unbooked patients (88.79%) as compared to booked patients. (Table no.2) In the study period, 66.95% of maternal deaths were due to direct causes. The hemorrhage (33.89%), eclampsia (22.4%), and sepsis (8%) were the major direct causes of maternal deaths. Other causes accounted for 4.59%. (Table no.3) In the study period, 33.045% of maternal deaths were due to indirect causes. Anemia, jaundice and heart disease accounted for 17.52%, 6%, and 2.58% of maternal deaths respectively and other cause accounted for 6.89% of maternal death (Table 4).

IV. Discussion

Maternal mortality is an important indicator of reproductive health of the society. High incidence of maternal deaths reflects poor quality of maternal services, late referral and low socioeconomic status of the community. The mean maternal mortality ratio in the study period was 253.13/100,000 live births. The current maternal mortality ratio (MMR) in India is 167/100,000 live births [1]. According to the Bhaskar K Murthy et al mean MMR was 302.23/100000 births [2]. Vidyadhar B. Bangal et al reported 12,544 deliveries, giving a MMR of 302.9/100,000 live births [3]. Saini V. and Gupta M [4] reported maternal mortality ratio (MMR) was 225.57 in 2012. According to Anjanadevi Santpure et al, [5] MMR in Govt. Medical College Aurangabad was 194.77 per 100,000 live birth from 2007-2009. This study has comparatively high MMR. This is because our hospital is a tertiary care hospital and receives a lot of complicated referrals both from rural and urban health care centers .The cases are usually referred at very late stage.

In our study, 68.9% of maternal deaths were in the age group of 21 to 30 years, as highest numbers of births are reported in this age group. 60.9% of maternal deaths were reported in multiparous patients. More maternal deaths were reported in women from rural areas (74.1%), unbooked patients (88.79%), and women belonging to low socioeconomic status (78.7%). All our findings were similar to studies by Bhaskar K Murthy et al [2], Jain M and Maharahaje S [6], Jadhav AJ and Rote PG [7], Pal A et al [8], Onakewho JU and Gharoro EP [9], Reeta Bhuyan and Gitanjali Deka [10] and Anjanadevi Santpure et al [5].

In our study, 66.95% of maternal deaths were due to direct causes. Hemorrhage (33.89%), eclampsia (22.4%), and sepsis (8%) were the major direct causes of maternal deaths. Our findings were consistent with studies by Bhaskar K Murthy et al [2], Jain M and Maharahaje S [6], Jadhav AJ and Rote PG [7], Pa A et al [8], Onakewho JU and Gharoro [9], Shah RJ et al [11] and Anjanadevi Santpure et al [5].

All these are preventable causes of maternal mortality. Unfortunately, in many cases, patients were referred very late and in critical condition. Most of these deaths were preventable if patients were given appropriate treatment at periphery and timely referred to higher centers.

Indirect causes of maternal deaths accounted for 33.045% in our study. Anemia, jaundice and heart disease were responsible for 17.52%, 6%, and 2.58% of maternal deaths, respectively. These findings were consistent with studies by Bhaskar K Murthy et al [2], Jain M and Maharahaje S [6], Jadhav AJ and Rote PG [7], Pal A. et al [8], Onakewho JU Gharoro [9] and Anjanadevi Santpure et al [5].

Vidyadhar B. Bangal et al [3] reported that both direct and indirect causes contributed to (50.00%) 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.

V. Conclusion

In this study most maternal deaths were seen in multiparous patients from rural areas, unbooked, and patients from low socioeconomic status. Most of the causes of maternal deaths are preventable. Improvement in primary health care in rural areas and proper implementation of National Rural Health Mission (NRHM) programs and up gradation of hospitals can bring down the number of maternal deaths. NRHM can play a major role in reducing maternal mortality by advocating institutional deliveries and timely referral of high risk cases

References

[1]. Special Bulletin on Maternal Mortality in India 2010-2012: Sample registration system, Office of Registrar General, India; Dec 2013.
[2]. Bhaskar K Murthy, Mangala B Murthy1, Priya M Prabhu2, Maternal Mortality in a Tertiary Care Hospital: A 10-year Review: International Journal of Preventive Medicine, Vol 4, No 1, January, 2013.105-109
[3]. Vidyadhar B. Bangal, Purushottam A. Giri , Ruchika Garg Maternal Mortality at a Tertiary Care Teaching Hospital of Rural India: A Retrospective Study: Int J Biol Med Res. 2011; 2(4): 1043 – 1046.
[4]. Saini V. and Gupta M. Review of Maternal Mortality in an Urban Tertiary Care Hospital of North India: International Journal of Basic and Applied Medical Sciences ISSN: 2277-2103 (Online) 2014 Vol. 4 (1) January-April, pp. 59-64
[5]. Anjanadevi Santpure, Kanan Yelikar, Sonali Deshpande MedPulse – International Medical Journal October 2015; 2(10):672-674
[6]. Jain M, Maharahaje S. Maternal mortality: A retrospective analysis of ten years in a tertiary hospital. Indian J Prev Soc Med 2003;34:103‑11.
[7]. Jadhav AJ, Rote PG. Maternal mortality–changing trends.JObstetGynaecol India 2007;57:398-400.
[8]. Pal A, Ray P, Hazra S, Mondal TK. Review of changing trends in maternal mortality in a rural medical college in west Bengal. J Obstet Gynecol India 2005;55:521‑4.
[9]. Onakewhor JU, Gharoro EP. Changing trends in maternal mortality in a developing country Niger J Clin Pract 2008;11:111‑20.
[10]. Reeta Bhuyan, Gitanjali Deka, Maternal deaths in a tertiary health care centre of Assam – a one year report The New Indian Journal of OBGYN. 2016; 2(2): 110-4
[11]. Shah RJ, Ali I, Banday A, Fazili A, Khan I. Analysis of maternal mortality in a small teaching hospital attached to tertiary care hospital. Indian J Community Med 2008;33:260-2.

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Dr.Urmila mahala: Collection, compilation, analysis, and interpretation of data.
Dr Om Prakash: Design of study and revision of manuscript
Dr Seema Mehta and Dr Manju Sharma: Conception of idea
Conflict Of Interest: - The authors have no conflicts of interest.

Tables:

Table no. 1 Distribution of maternal deaths according to socio-demographic parameters

Socio-demographic parameters		**Number = (348)**	**Percentage (%)**
Age	<20 yr	23	6.6%
	21-25yr	165	47.4%
	26-30yr	75	21.5%
	31-35yr	55	15.8%
	>35yr	30	8.6%
Residence	Rural	258	74.1%
	Urban	90	25.86%
Socioeconomic status	Lower	274	78.7%
	Middle	62	17.8%
	High	12	3.45%
Parity	Prime gravida	136	39.08%
	Multi gravida	211	60.9%
Antenatal booking	Booked	39	11.2%
	Unbooked	309	88.79%

Table no. 2 Year wise distribution of live births, maternal deaths and MMR

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Live berths	31	31	25	35	34	33	42	41	46	30
Maternal deaths	10706	10873	11544	12064	12235	14476	16353	16753	17192	17139
MMR	289.55	285.10	216.56	290.11	277.89	227.96	256.83	244.7	267.56	175

Table no. 3 Year wise distribution of direct causes of maternal deaths (N = Number, % = Percentage)

Year	**Hemorrhage**		**Sepsis**		**Eclampsia**		**Others**		**Total**	
	N	%	N	%	N	%	N	%	N	%
2007	10	32.258%	2	6.45%	7	22.58%	1	3.22%	20	64.516%
2008	9	29.03%	3	9.67%	6	19.35%	1	3.22%	19	61.29%
2009	10	40%	5	20%	5	20%	0	0%	20	80%
2010	9	25.7%	2	5.71%	9	25.71%	2	5.71%	22	62.8%
2011	15	44.1%	2	5.88%	6	17.65%	1	2.94%	24	70.6%
2012	7	21.21%	2	6.06%	9	27.27%	1	3.03%	19	57.58%
2013	14	33.33%	4	9.52%	8	19.04%	4	9.52%	30	71.43%
2014	11	26.83%	4	9.756%	9	21.95%	3	7.3%	27	65.85%
2015	13	28.26%	2	4.48%	14	30.4%	0	0%	29	63.04%
2016	13	43.33%	2	6.66%	5	16.67%	3	10%	23	76.67%
Total	**111**	**33.89%**	**28**	**8%**	**78**	**22.89%**	**16**	**4.59%**	**233**	**66.95%**

Table no. 4 Year wise list of indirect causes of maternal deaths (N = Number, % = Percentage)

Year	**Anemia**		**Jaundice**		**Heart disease**		**Others**		**Total**	
	N	%	N	%	N	%	N	%	N	%
2007	6	19.35%	2	6.45%	0	0%	3	9.677%	11	35.48%
2008	7	22.58%	2	6.45%	0	0%	3	9.677%	12	38.7%
2009	2	8%	1	4%	0	0%	2	8%	5	20%
2010	5	14.28%	2	5.71%	2	5.71%	4	11.428%	13	37.14%
2011	4	11.76%	2	5.88%	2	5.88%	2	5.88%	10	29.4%
2012	7	21.21%	3	9.09%	2	6.06%	2	6.06%	14	42.42%
2013	6	14.28%	3	7.14%	2	4.76%	1	2.38%	12	28.57%
2014	8	19.51%	3	7.31%	1	2.44%	2	4.88%	14	34.15%
2015	12	28.08%	3	6.52%	0	0%	2	4.347%	17	36.95%
2016	4	13.3%	0	0%	0	0%	3	10%	7	23.34%
Total	61	17.52%	21	6%	9	2.58%	24	6.89%	115	33.045%