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Profile of Maternal Deaths: A Three Year Autopsy Based Retrospective Study in Western Maharashtra Region

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Abstract

Aims: This retrospective study was carried out to know the different epidemiological aspects of maternal deaths. *Material and Method:* This three year retrospective study was carried out in department of Forensic Medicine & Toxicology, Dr Vaishampayan Memoral Government Medical College Solapur, Maharashtra from January 2014 to December 2016. This study is based on the medico-legal autopsy record of Maternal deaths. *Results:* Overall MMR of the Institution was 369 and the incidence of maternal deaths due to obstetric causes as compared to overall medico-legal autopsies was 1.70 for the study period respectively. Most of the deaths occurred in the age group 21 to 25 i.e. 42.71%. Urban deaths were more 57.28% as compared to rural population. Hindu population deaths were 66.99% as compared to Muslims and other religious groups. 48.31% of deaths took place at tertiary care unit. In 38.83% of cases the tertiary care unit was within reach that is less than 10 km from the place of residence. 33% of deaths have taken place in between 12 pm to 6 pm. *Conclusion:* Maternal death is social injustice and to be dealt with sensibly.

Keywords: MMR; Maternal Mortality; Autopsy.

Introduction

A maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes [1]. Pregnancy-related death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death [1].

Maternal mortality ratio is defined as the number of maternal deaths per 100,000 *live births,* a measure of the risk of death once a woman has become pregnant [2].

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Maternal mortality rate (MMR) is dependent upon the general socioeconomic status, nutrition level and the level of maternal healthcare in the community and it is recognized as a social indicator [3]. The MMR of year 2015 [1] of developing nations like India (174), Pakistan (140), Bangladesh (176) showed that it is much higher than developed nations like United Kingdom (08), USA (28) and Russian Federation (24). The condition of underdeveloped Nations of Central African Republic is worst than the Asian zone with MMR 882.

In most of the developing countries, maternal deaths are the tip of iceberg, which signal everyday tragedies of women's lives and reflect how world's poverty has been feminized [4].

Hence this study is designed to study the profile of maternal deaths to know the various epidemiological factors including incidence, distribution and possible control of factors relating to maternal deaths.

Material and Method

This 3 year retrospective study was carried out in the Department of Forensic Medicine and Toxicology,

Dr Vaishampayan Memoral Government Medical College Solapur, a Western Maharashtra region from January 2014 to December 2016.

This study is based on the record of maternal deaths that had been brought for medico-legal autopsy in the department. The detailed pertaining to age, area of residence, marital status, religion, place of delivery, distance of tertiary care from the place of residence or place of referral, time of death have been taken from post mortem memorandum and investigating agencies documents submitted for requesting autopsy such as panchanama and treatment record. The data was entered on predesigned data sheet to maintained uniformity, tabulated and then statistically analyzed.

Inclusion Criterion

All the maternal deaths brought to the department during the study period either directly or indirectly related to the complications of pregnancy.

Exclusion Criterion

All the un-natural maternal deaths.

Ethical Committee Clearance

As the data was retrospectively collected and as no revelations of identity ethical committee clearance not required.

Conflict of Interest and Sources of Funding: None

Results

A total 6057 medico-legal autopsies have been done during the three year of study period out of which a total 103 autopsies have been contributed to Maternal deaths hence on an average the percentage was 1,70% (Table 1). A total 27852 females have been admitted in the Institution for delivery hence the Maternal Mortality Ratio was to be 369 (Table 1).

In our study no case has been reported as below the age of 18 years. Maximum 44 (42.75%) deaths were observed in the age group 21 to 25 years. A total 65 (63.10%) cases were in the age range below 25 years of age (Table 2).

Urban deaths were more i.e. a total 59 cases (57.28%) as compared to rural locality 44 cases (42.71%) (Table 3).

As regard to religion maximum cases have been observed in Hindu religion 69 cases (66.99%) followed by other religious groups predominantly Buddhist and Lingayat sect. 25 cases (24.27%) as compared to Muslims 9 cases (8.73%) (Table 4).

Maximum patients 43 (48.31%) have been delivered at our Institute working as a Government Medical College and Tertiary care unit of State in the studied region. A total 17 cases (19.10%) have been treated at Rural Governmental health facilities including Primary Health Center and Rural Hospital/General Hospital. Hence a total 60 (67.41%) cases have been availed the government health facilities. 21 cases (23.59%) have been treated in private hospitals. And only 8 cases (8,98%) have been delivered out of the ambit of health facilities hence devoid of skilled technical staff during the delivery. 14 cases have died before hospitalization (Table 5).

For 40 cases (38.83%) the Government run Multispecialty Institute in the form of Medical College as a tertiary care unit was within the reach i.e. less than 10 k.m. from the place of their residence. A total 42 cases (40.77%) were residing in the range of 11 to 50 k.m. But for 21 cases (20.83%) the government run tertiary care unit was more than 50 k.m. (Table 6).

Table 1: Showing Maternal Deaths and MMR

Year	Total medico-legal autopsies	Maternal deaths	Percentage	Total females admitted for delivery	MMR
2014	2014	25	1.24	8429	296
2015	2048	42	2.05	9217	455
2016	1995	36	1.80	10206	352
Total	6057	103	1.70	27852	369

Table 2: Age wise distribution of cases

Age Group	Number of Cases	Percentage
15 to 20	21	20.38
21 to 25	44	42.71
26 to 30	25	24.27
31 to 35	12	11.65
36 to 40	1	0.97
Total	103	100

Table 3: Residence wise distribution

Residence	Number of Cases	Percentage
urban	59	57.28
Rural	44	42.71
Total	103	100

Table 4: Religion wise distribution

Religion	Number of Cases	Percentage
Hindu	69	66.99
Muslim	9	8.73
Other	25	24.27
Total	**103**	**100**

Table 5: Place of delivery wise distribution (N=89).

Place of Delivery	Number of Cases	Percentage
PHC	8	8.98
RH	9	10.11
GMC	43	48.31
PVT	12	13.48
Pvt multi	9	10.11
Home	7	7.86
farm	1	1.12
Total	**89**	**100**

14 cases remain undelivered with the product of conception in womb before death.

Table 6: Distance of state government tertiary health facility from residence at the time of delivery

Distance	Number of Cases	Percentage
Within 10 km	40	38.83
11 to 20	5	4.85
21 to 30	8	7.76
31 to 40	15	14.56
41 to 50	14	13.59
Above 50	21	20.38
Total	**103**	**100**

Table 7: Time of death wise distribution

Time in AM/PM	Number of Cases	Percentage
12 am to 6 am	21	20.38
6 am to 12 pm	22	21.35
12 pm to 6 pm	34	33.00
6 pm to 12 am	26	25.24
Total	**103**	**100**

Most of the deaths occurred between 12 pm to 6 pm during the day time 34 cases (33.00%) but there was no significant difference between the maternal death and time quarter and the deaths have been uniformly occurred in all time slots (Table 7).

Discussion

Maternal Mortality Ratio

In the present study a total 27852 females have been admitted in the Institution for delivery hence the Maternal Mortality Ratio was to be 369.

In India, the Maternal Mortality Ratio was 174 in the year 2015 [1] and the Maternal Mortality Ratio of Maharashtra was 68 [5].

Hence the MMR in present study was considerably higher than the National as well as the ratio of the State. This may be explained based on the fact that this Institution is a tertiary care unit and complicated cases from peripheral areas are referred to this hospital

Ann L Montgomerry et al [6] reported MMR of Urban India as 245 and that of rural parts to be 397, Jadhav et al [7] (Solapur, Maharashtra) MMR to be 395, Madhuri Badrinath et al [8] (North Karnataka) MMR as 277.19, Hence our findings are consistent

with these studies But Panchabhai et al [3] reported MMR to be 827 form Mumbai, Maharashtra, Pal Amitava et al [9] (West Bengal) as 623, Ratan Das et al [10] (West Bengal) as 518.48, Chakraborti S et al [11] (Kolkata) to be 494.33. Our findings are thus in consistent with studies from tertiary care institution reported MMR ranged between 213 to 879 per 1,00,000 live births.

Age

In our study no case has been reported as below the age of 18 years. Maximum 44 (42.75%) deaths were observed in the age group 21 to 25 years and 24.27% in the age group 26-30 years. A total 65 (63.10%) cases were in the age range below 25 years of age.

Ann L Montgomerry et al [6] al study from India reported 30.5% cases in age range 20-24 years and 20.1% in age range 25-29 years Jadhav et al [7] reported 42.40% in age range of 20-24 years from the study at Solapur, R V Bardale et al [12] (Nagpur, Maharashtra) recorded 52.38% in a age group ranging 21-25 years and 38.09% in the age group of 26-30 years, Madhuri Badrinath et al [8] (North Karnataka) reported 46.66% and 31.11% in the age range 21-25 and 26-30 years respectively, Shobha Mukkherjee et al [13] (U.P) 33% (21-25 years) and 35% (26-30 years) Sibram Chatopadhyaya et al [14] (West Bengal) 20- 30 years age group 41%, Vidyadhar Bangal et al [15] (Loni, Maharashtra) 55.27% in the age range 19-24 years, Ratan Das et al [16] 67.17% below 25 years of age. Clara Menedez et al [16] (Mozambique) reported 48.9% in age range 21-30 years, Hence our study was in consistent with other studies as regard to age and maternal deaths.

P.N Makinga et al [17] (South Africa) 18 % in 20-24 years and 29.5% and 23% in age range 25-29 and 30-34 years age group respectively. Hence we slightly differ with study at South Africa and late age of marriage as compared to India might be the reason for this.

Locality

In our study Urban deaths were more i.e. a total 59 cases (57.28%) as compared to rural locality 44 cases (42.71%).

Ann L Montgomerry et al [6] al study from India reported locality wise distribution as Rural 86.3% and Urban to be 13.7%, Jadhav et al [7] (Solapur) reported the distribution as Urban 64.55% and Rural to be 35.44%, Pal Amitava et al [9](West Bengal) noticed urban distribution to be 38.34% and rural to be 61.66%, Ratan Das et al [10] (West Bengal) and Vidyadhar Bangal et al [15] (Loni, Maharashtra) in their study have none of the population from urban area.

Hence our study does not coincide with the studies of Ann L Montgomerry carried out considering the entire Nation showing more rural deaths as compared to urban. Also it sharply contradict with the studies of Ratan das et al and Vidyadhar Bangal et al where none of the case from urban area as their study was in rural area only.

Religion

In this study, as regard to religion maximum cases have been observed in Hindu religion 69 cases (66.99%) followed by other religious groups (predominantly Buddhist and Lingayat) 25 cases (24.27%) as compared to Muslims 9 cases (8.73%)

Ann L Montgomerry et al [6] reported 79.3% Hindu, 16.9% to be Muslim and others comprises of 3.8% from the data across India. The study region predominantly comprises of Hindu population and majority of other religious groups were from Buddhist and Lingayat community.

Place of Delivery

In this study place of delivery was PHC in 7.76%, RH in 8.73%, GMC in 47.57%, Private Maternity homes in 16.50%, Private Multispecialty hospitals in 11.65%, Home deliveries followed by referral to Government Medical College in 6.79% and 0.97% in farm at open place. Ann L Montgomerry et al6 from the data from India reported 49.7% home deliveries, 13.8% deliveries in transit and 36.5% deliveries at health facilities. Vidyadhar Bangal et al [15] (Loni, Maharashtra) reported home deliveries in 9.67%, Private hospitals in 22% and tertiary care unit in 64.51% of cases and PHC/RH in 3.22%. R V Bardale et al [12] (Nagpur Maharashtra) reported hospital deliveries in 77.77% and at home in 22.22%. P.N Makinga et al [17] (South Africa) reported the availing of health facilities in 75% and home deliveries in 25.5% of cases. Hence in our study only 7.76% deliveries have taken place out of the ambit of health facilities and was in consistent with Vidyadar Bangal et al the study belonging to nearby region and was in contrast with all other studies in this respect. This was explained by the fact that the Government Medical College was within the range of 50 k.m. in 79.59% of cases and for 38.83% it was within the reach of 10 k.m.(Table 6).

Time of Death

Most of the deaths occurred between 12 pm to 6 pm during the day time 34 cases (33.00%) but there was no significant difference between the maternal death and time quarter and the deaths have been uniformly occurred in all time slots.But the observed values were in contrast to this hypothesis. No such study in this arena was found in the literature.

Conclusions

Primary Health Care Centers, Rural and General Hospitals will be equipped with more skilled personals and advanced equipments to treat the mothers in morbid state so as to ensure rapid diagnosis and treatment in high risk cases. The death of pregnant women is a social injustice and human rights violation and preserving mother life should be dealt with war footings.

References

1. WHO, Maternal mortality ratio: www.who.int, Health data and statistics.
2. Definitions of Maternal Mortality, Produced by the Population Research Institute www.pop.org/ definitions-of-maternal-mortality.
3. Panchabhai TS, Patil PD, Shah DR, Joshi AS "An autopsy study of maternal mortality: A tertiary healthcare perspective" J Postgrad Med 2009;55: 8-11.
4. Park K. Textbook of Preventive and Social Medicine: 21 SL edition 2011; Banhasidas Bhannol Publishers 515:16-2.
5. Censusindia.gov.in/.../Sample_Registration_ System.html: Sample registration system -2011 Census of India; Maternal Mortality Ratio Bulletin 2011-13.
6. Ann L. Montgomery, Usha Ram, Rajesh Kumar, Prabhat Jha. Maternal Mortality in India: Causes and Healthcare Service Use Based on a Nationally Representative Survey Published online 2014 Jan 15. doi:10.1371/journal.pone.0083331;PMCID: PMC3893075.
7. Jadhav CA, Gavandi Prabhakar, Shinde MA , Tirankar VR. Maternal Mortality: Five Year Experience in Tertiary Care Centre"Indian Journal of Basic & Applied Medical Research; 2013 June;7(2):702-709.
8. Dr. Madhuri Badrinath1, Dr. Saraswathi A Karekal. "Maternal Mortality: A Retrospective Study" Journal of Nursing and Health Science (IOSR-JNHS) e-ISSN: 2320–1959.p- ISSN: 2320–1940. 2015 March-April;4(2):10-13.
9. Pal Amitava, Ray Prasanta, Hazra Samir, Mondal TK. Review of changing trends in maternal mortality in a rural medical college in West Bengal" J Obstet Gynecol India 2005 Nov-Dec;55(6):521-524.
10. Ratan Das, Soumya Biswas and Amitava Mukherjee. "Maternal Mortality at a Teaching Hospital of Rural India: A Retrospective Study" International Journal of Biomedical And Advance Research (IJBAR) 2014; 05(02):105-117.
11. Chakraborty S, Sebanti G. "Maternal Mortality Rate and its causes– Changing trends in Kolkata, India" IJRRMS, 2012 Jan-Mar;2(1):16-18.
12. R. V. Bardale, P. G. Dixit. "Pregnancy-related deaths: A Three-year retrospective study" J Indian Acad Forensic Med, 32(1):15-18.
13. Shobha Mukherjee1, Sujoy Mukherjee, Reena R Sarkar" A six year retrospective study of maternal mortality at a tertiary teaching institute in Utter Pradesh" "International Journal of Medical Science and Public Health, 2014;3(11):1407-1409.
14. Dr. Shibram Chattopadhyay, Dr. Dilip Biswas, Dr. Narayan Jana, Dr. Apurba Mondal, Dr. Debobroto Roy, Dr. Shritanu Bhattacharyya, "Changing trends of maternal death –A five years study in a rural medical college in India" IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 2014 Sep;13(9):32-35.
15. Vidyadhar B. Bangal, Purushottam A. Giri b, 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.
16. Mene´ndez C, Romagosa C, Ismail MR, Carrilho C, Saute F, et al. (2008) An autopsy study of maternal mortality in Mozambique: The contribution of infectious diseases. PLoS Med 5(2): e44. doi:10.1371/ journal.pmed.0050044.
17. PN Makinga , J Moodley & MJ Titus.The profile of maternal deaths in a district hospital: a five-year review of maternal deaths from 2006–2010, South African Family Practice, 2012;54(6):518-524.