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"Half decadal trend of maternal deaths occurred in a tertiary care hospital of Rajasthan"

[1]Dr. Chandrakanta Sulaniya, [2]Dr Pawan Kumar Sulaniya, [3]Dr. Kusum Lata Gaur, [4]Dr Anju Sharma, [5]Dr. Bhanwer Singh Meena,

[1]Senior Resident, Department of Obstetrics & Gynecology, SMS Medical College, Jaipur (Raj.) India
[2]Assistant Professor, Department of Pediatrics, SMS Medical College, Jaipur (Raj) India.
[3]Professor and WHO Fellow IEC, Department of Community Medicine, SMS Medical College, Jaipur (Raj.) India
[4,5]Professor, Department of Obstetrics & Gynecology, SMS Medical College, Jaipur (Raj) India.

Abstract:
Background: *India contributes one fourth of total world maternal deaths. Millennium Development Goal set to reduce maternal mortality upto or less than 109 per lakh of total live births which is far away from present level specially in Rajasthan[2]*
Objective: *To know the trend of maternal deaths occurring in last five year (2005-2009).* ***Materials and Methods:*** *Records of verbal autopsies of maternal deaths occurred in Mahila Chikitsalya Jaipur since 1st Jan. 2005 to 31st Dec. 2009. Available data in the autopsy records of maternal deaths were collected and then these data were entered in MS Excel 2007 worksheet. These data were classified and presented in percentage and proportion. Chi-square and ANOVA test of significance were used to interpret data.*
Results: *Overall 193 maternal mortality per lakh of total live births was observed in year 2005-2009 with maximum MMR in 2008 (236/lakh TLBs) and minimum MMR in Year 2009 (133/lakh TLBs) which has significant variation. Total 133 maternal deaths occurred in study period of five years. Although maximum maternal deaths (69 i.e. 51.88%) occurred in 21 to 25 years group but age-wise variation was not found significant (p>0.05). Maternal deaths were significantly more in un-booked cases, within 24 hours of addimission and in post-partum period with rural predominance than unbooked cases, after 24 hours of addimission, in other maternal death period and urban females respectively.*
Conclusions: *Maternal deaths were found to significantly vary with time but not with season and age of mother. These deaths were also found significantly more in un-booked cases, within 24 hrs of addimission and in post-partum period with rural predominance than their counterparts*
Key words*: Maternal deaths, Trend, Verbal Autopsy, MMR, TLBs*

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" (ICD-10). Almost half a million women die every year from complications during pregnancy and childbirth. About 99% of these women are from developing world with over 90% concentrated in Africa and Asia.[1]

World Health Organization estimates that globally 358,000 women die every year due to pregnancy-related complications out of that India contributes one fourth of these maternal deaths. [2] The Millennium Development Goals of the United Nations has set the target of achieving 109 maternal deaths/1,00,000 live births by 2015.[3] Within India, there is marked variation in MMR and healthcare access between regions and in socioeconomic factors[4,5]. India contributes approximately 63,000 maternal deaths each year .National average of MMR IS 212/100000 live births.(RGI 2007-2009)[6]

MMR in India, though far from the target set by MGD, has declined from 254 in 2004 to 212 in 2007 but in some states including Rajasthan MMR is still very high. Rajasthan has 318 maternal death/1,00,000 total live births.[7]

So, this present study was conducted to know the trend of maternal deaths in last five years on with verbal autopsy of maternal deaths occurring in a tertiary level hospital of western Rajasthan.

II. Materials and Methods

A record base cross-sectional study was conducted on records of verbal autopsies of maternal deaths occurred in Mahila Chikitsalya Jaipur, which is a tertiary level hospital attached to SMS Medical College, Jaipur. Records of verbal autopsies of maternal deaths occurred in Mahila Chikitsalya Jaipur since 1st Jan. 2005 to 31st Dec. 2009.

All verbal autopsy forms recording death of women in pregnancy, or 42 day post-abortion, or 42 days post-partum or due to reason that had been assigned an ICD-10 O-code (obstetric causes) of three-digit International Classification of Diseases and Related Health Problems, 10th revision (ICD-10)[5]

Data available in these records were collected and compiled in the form of master chart in Microsoft MS excel sheet 2007. These data were classified and analyzed with the help of computer and presented in figures and percentage and proportions. Chi-square and ANOVA test of significance were used to interpret data.

III. Result

Out of total 68870 total live births, 133 maternal deaths occurred in study period of five years revealing overall Maternal Mortality Rate (MMR) 1.93 per thousand total live births (193/1,00,000 TLBs) with maximum MMR (236/1,00,000 TLBs) was observed in year 2008. In last year of survey (2009) it was observed only 133/1,00,000 TLBs and this trend of MMR was having significant variation ($p=0.346$).

Out of total 133 maternal deaths occurred in study period of five years, maximum deaths i.e. 35 (26.32%) were observed in 2008. It was observed that maternal deaths were continuously on increase from year 2005 to year 2008 after that it was decreased in year 2009. It was also observed in this study that although there was a sudden increase in number of deaths in June 2008 but variation in number of maternal deaths as per season was not found significant ($p>0.05$) in any year.

It was also depicted from this study that although maximum deaths (69 i.e. 51.88%) occurred in 21 to 25 years group followed by number of deaths in age group of 26 to 30 years but this variation was not found significant ($p>0.05$). Likewise, when mean age at death of mother was compared with the time no significant difference was observed ($p>0.05$)

It was also observed that maternal death was significantly more ($p<0.001$) in rural mothers than the urban (89 v/s 44 i.e. 66.92% v/s 33.08%).

Majority maternal deaths i.e. 120 (90.23%) were observed in unbooked pregnancies which was found significant ($p<0.001$). Likewise it was also observed that majority maternal deaths i.e. 115 (86.47%) were occurred within 24 hours of addimission which was also found significant ($p<0.001$).

In about half of maternal deaths i.e. 66 (49.62%) occur in post-partum period followed by ante-partum and intra-partum period which was also found significant ($p<0.001$). Like wise primi-gravida contributes about half of the maternal deaths (65 i.e. 48.87%) but it was not found significant ($p>0.05$).

IV. Discussion

A 5 yrs retrospective study of maternal mortality and its common complications leading to maternal death was conducted. A retrospective study of hospital records and death summaries of all maternal deaths over 5 yr periods was carried out since Jan 2005 to Dec 2009.

In the present study overall MMR was observed 193/1,00,000 TLBs majority of women (115 i.e. 86.47.%) died within 24 hrs of admission. In contrast to the findings of present study many of authors[1,8,9,10,11] reported MMR in range of 230 to 454/lakh TLBs. Murthy etall[1]. Onakewhor JU etall[8] Kumar R etall[9] Nusrat N et all[10] and Jadhav et all[11] reported 302, 454, 230, 297 and 395/lakh TLBs respectivly. This may be explained that Mahila Chikitsalay where this study was conducted is a premier tertiary care hospital of Rajasthan. This was further supported by findings of Chawala etall[12], who reported MMR only 85.42/lakh TLBs. MMR is observed much lower of Kerala Tamil Nadu and Maharashtra, 81, 97 and 104 respectively. These are the three states in India which have realized the MDG target of MMR 209.[7] At global level, WHO studies show there is much variability between countries, with MMR of 290 in developing regions as compared with14 in developed regions.[13]

In the present study significantly more maternal deaths were reported in age group of 25-30 yrs (%) with predominance of rural area women. In contrast to this Murthy etall[1] reported that out of total 120 maternal deaths most of deaths occurred in the age group of 20-24 years and likewise Jadhav et all[11] study shows maximum of maternal deaths (75.1%) were in >20 years and <30 years of age. But well supported findings were of Onakewhor JU etall[8] and Puri Alka et all[14] Onakewhor JU etall[8] reported maternal death women of 20-39 years 81.3% with 9.4% teenage deaths and Puri Alka et all[14] study showed that 71.53%of women die between the age 21 and 30years.

There were significantly more maternal deaths were observed of rural mothers than the urban in the present study (66.92% v/s 33.08%). Well comparable findings were of Murthy etall, who also reported

significantly more maternal deaths from rural areas (69.16%) as compared to women from urban areas (30.83%).

In the present study there was no significant variation was observed in gravid –wise whereas Murthy etall[1] and Onakewhor JU etall[8] reported more deaths in multiparas than nulliparas, who reported 56.66% and 62.5% deaths in multiparas respectively.

In the present study significantly more maternal deaths were observed in un-booked than booked cases (90.23% v/s 9.77%). Almost similar was observed by Puri Alka et all[14] who reported that 92.30% of women died were unbooked while 1.53% were booked cases. Murthy et.all[1] also reported significantly more maternal deaths were reported in unbooked patients (83.33%) as compared to booked patients (16.66%). Even Jadhav et all[11] also has well comparable observation to present study i.e. 78.48% deaths in booked and 21.51% deaths in unbooked cases.

In the present study although there were more deaths in multipara than nulliparas but this difference was not significant. Almost similar observations were made by Murthy etall[1] , Onakewhor JU etall[8] , Jadhav et all[11] and Puri Alka et all[14] who also reported more deaths in multiparas than nulliparas, who reported 56.66%, 62.5%, 50.64% and 51.33% maternal deaths in multiparas respectively.

There were significantly more maternal deaths were observed in post natal period and within 24 hours in the present study. Well comparable findings were of other authors like Murthy etall[1] , Onakewhor JU etall[8] , Jadhav et all[11] and Puri Alka et all[14]

V. Conclusion:

MMR is observed little higher to national average in the present study. Maternal deaths were without year-wise, season-wise, age wise and gravid -wise significant variation**.** But these maternal deaths were significantly more in un-booked cases, within 24 hours of addimission and in post-partum period with rural predominance than unbooked cases, after 24 hours of addimission, in other maternal death period and urban females respectively.

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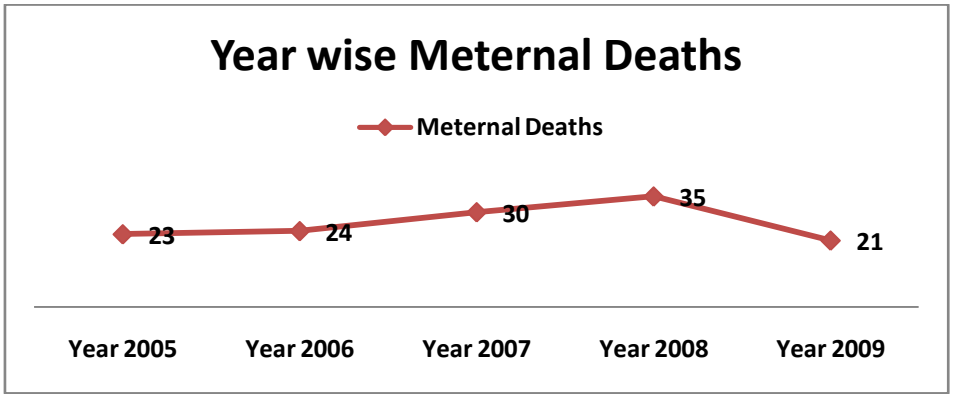
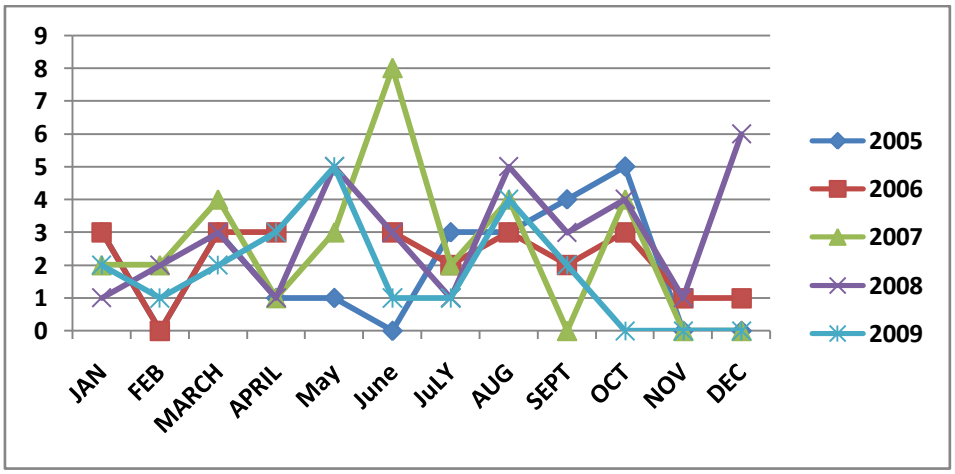
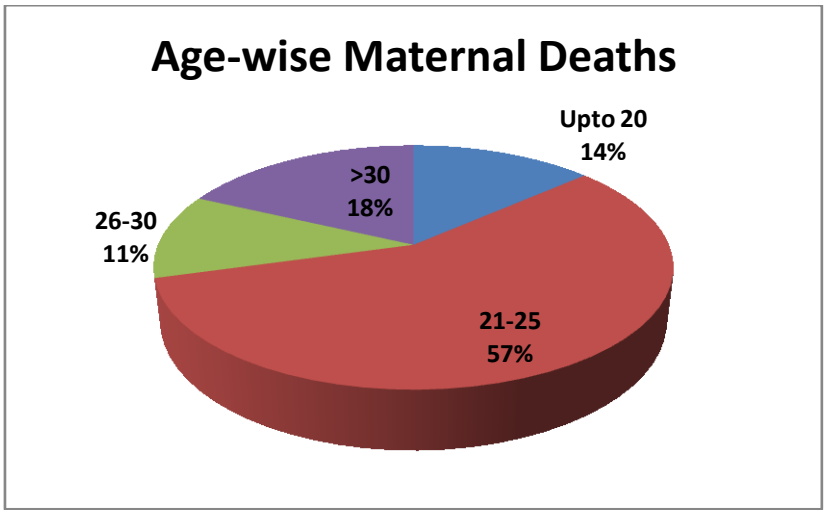
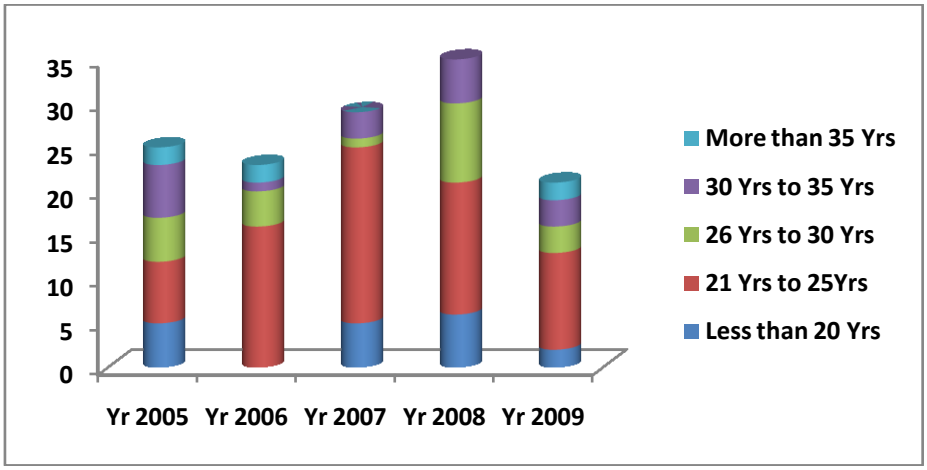




Monthly trend of Yearly Maternal Deaths

Chi-square = 56.607 at 44 DF P = 0.113 LS=NS





Age wise maternal death trend from year 2005 to 2009

Table No. 1 **Maternal Mortality Ratio (MMR) trend from year 2005 to 2009**

S. No.	Year	Total No. of Live Births	Number of Maternal Deaths	MMR Maternal Deaths /Lakh TLBs
1	Yr 2005	11123	23	207
2	Yr 2006	12433	24	193
3	Yr 2007	14677	30	204
4	Yr 2008	14823	35	236
5	Yr 2009	15814	21	133
6	Total	68870	133	193

Chi-square Test =170.675 at 4 DF P <0.001 LS=S

Table No. 2 **Age wise maternal death trend from year 2005 to 2009**

S. No.	Year	Mean Age at Death	SD of Age at Death
1	Yr 2005	27.28	6.85
2	Yr 2006	26.22	6.28
3	Yr 2007	24.38	4.25
4	Yr 2008	25.63	4.89
5	Yr 2009	27	5.81

ANOVA (F) =1.14 at 131DF P = 0.343 LS=NS

Table No. 3 **Age wise maternal death trend from year 2005 to 2009**

S. No.	Variables	Maternal Deaths (total Maternal deaths n=133)	
		Number	%
	Residence of Mother died		
1	Urban	89	66.92
2	Rural	44	33.08
	Chi-square Test =29.113 at 1 DF P < 0.001 LS=S		
	Booking Status of Mother died		
1	Booked	13	9.77
2	Unbooked	120	90.23
	Chi-square Test =168.962 at 1 DF P < 0.001 LS=S		
	Gravidity of Mother died		
1	Primigravida	65	48.87
2	Multipara	68	51.13
	Chi-square Test =0.060 at 1 DF P=0.806 LS=NS		
	Timing of Maternal Death in Female's reproductive phase		
1	Abortion	2	1.50
2	Ante-partum	47	35.34
3	Intra-partum	18	13.53
4	Post-partum	66	49.62
	Chi-square Test =99.078 at 1 DF P < 0.001 LS=S		
	Time lag in Addimission and maternal Death		
1	Within 24 Hours	115	86.47
2	After 24 Hours	18	13.53
	Chi-square Test =138.586 at 1 DF P < 0.001 LS=S		