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Study of Causes of Maternal Mortality over a Decade

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Research Article

Abstract: **Introduction:** Maternal mortality is an important indicator of the reproductive health of the society, overall effectiveness of the obstetric health care system and also of the general health care system of that country. In spite of large efforts from all the Health service levels the set Millennium development goal (MDG-5) for reduction in maternal mortality is still far away. **Objectives:** A retrospective analysis of maternal deaths over a decade from January 2000 to December 2009 at Swami Ramanand Teerth Rural Medical College and Hospital, Ambajogai was done with objectives of finding maternal mortality rate, analyzing causes of deaths direct and indirect for reducing it with best efforts. **Results:** In all 88 maternal deaths were recorded in 10 years from 2000-2009 among 52946 live births giving maternal mortality rate of 1.66/1000 live births. Of these 68 deaths were due to direct causes like ecclampsia and preeclampsia, haemorrhage and sepsis with major culprit being preeclampsia-eclampsia. 20 deaths were because of indirect cause. Major culprit being anemia, pulmonary embolism and liver diseases mainly infective hepatitis. **Conclusions:** Registration of all pregnant mothers for antenatal care, screening of high risk cases, early diagnosis and timely referral of critically ill mothers to higher centers will help in reducing the maternal mortality ratio substantially.

Key Words: Maternal mortality.

Introduction

Maternal death is the death of a woman during pregnancy or in the 42 days post partum due to causes directly or indirectly associated with pregnancy (1) Avoidance of unwanted births, proper antenatal care, institutional deliveries and delivery coupled with empowerment of women has made maternal deaths during pregnancy a rare phenomenon in the industrial world, but it is still a commonly encountered phenomenon in the developing world (2). Maternal mortality is an important indicator of the reproductive health of the society, overall effectiveness of the obstetric health care system and also of the general health care system of that country (3,4). International community committed itself to reduce maternal mortality ratio by three quarters (75%) between 1990 and 2015. This can only be achieved by expected annual decline of 5.5% in maternal mortality ratio (5,6). But the trends show that at global level maternal mortality reduced at an average of less than 1% annually between 1990 and 2005. i. e. far below which is necessary for achieving MDG-5 goal concerning with maternal mortality reduction. According to National Health Policy (2002) India set a target to reduce maternal mortality ratio to less than 100 by 2010 which is still not achieved. To achieve this goal Government is putting lot of efforts in the form of various programs like NRHM, various RCH interventions, Emoc training to medical officers, but still we are lacking in achieving the desired goal(7). Present study was carried out in the Swami Ramanand Teerth Rural Medical College and Hospital, Ambajogai which serves a large population; major section belongs to low socio- economic strata and rural area. In the catchment area of this hospital there are problems of poor resources of health facilities, lack of awareness about antenatal care and institutional delivery, under utilization of health facilities, delayed referral and poor transport facilities. Purpose of the present study was to study causes of maternal mortality in this hospital for reducing it with best efforts.

Aims and Objectives

1. To identify the maternal deaths occurred between 1 January 2000 to 31 December 2009
2. To calculate maternal mortality Ratio (MMR) for the individual year and for the total study period.
3. To analyze the causes and various epidemiological factors responsible for maternal deaths

Materials and Methods

It is a prospective analysis about all maternal deaths at Swami Ramanand Teerth Rural Medical College and Hospital, Ambajogai over a period of 10 years from 01/01/2000 to 31/12/2009. Data was obtained by reviewing the mortality register and each individual case record. Each case record was analysed in detail with emphasis on calculation of the maternal mortality ratio for each year. Causes of deaths, all direct, indirect and unrelated along with interventions done were studied.

Conclusions

1. 84.09% mothers died were unregistered. This reflects the lack of awareness towards antenatal care. All levels of health care faclilities should try their best to reach the pregnant mothers and create awareness about antenatal care among them.
2. Eclampsia, preeclampsia and anemia were the conditions maximally associated with maternal deaths. Regular antenatal visits, supplementation of iron and folic acid will reduce large number of maternal deaths.
3. Majority of mothers 92.05% (81) were critically ill on admission. Delay in referral either due to late diagnosis or time taken to travel was responsible for it.
4. Regular antenatal visits, early diagnosis of high risk cases and timely referral will reduce maternal mortality significantly.

Discussion

1. Despite various programs launched by Government of India like Janani Shishu Yojana in an attempt to reduce maternal mortality, still there is lack of awareness about ANC care and ANC registration which is the major issue to be considered (1, 8).
2. Maternal mortality ratio observed here during this decade was less than the National MMR.
3. Conditions which are easy to diagnose like preeclampsia, ecclampsia, anemia were the commonest causes of maternal mortality reflecting lack of antenatal care and timely referral These findings are consistant with the observations made by Naik S etal in 2010(8) and Jadhav et al in 2007 (9)
4. Training of all medical officers working at peripheral centers for prompt diagnosis and management of common conditions like preeclampsia, ecclampsia, anemia liver disease should be done.
5. 84.09%(74) mothers died was unregistered . Effort should be made by health care facilities at all levels for registration of all pregnant women for ANC care. Similar findings were noted by Naik S etal (8)
6. Regular death audit meetings should take place at institutional level to create awareness regarding avoidability of maternal deaths. Underreporting of maternal deaths should be checked.(10)
7. Thus registration of all pregnant women, screening of high risk cases. Early diagnosis and timely referral of critically ill mothers to higher centres will help in reducing the maternal mortality ratio substantially.

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Table 1: Year wise distribution of maternal deaths.

Year	No. Maternal deaths	No. of live birth	MMR
2000	8	4180	1.913876
2001	7	4171	1.678255
2002	11	4275	2.573099
2003	9	4662	1.930502
2004	5	5099	0.980584
2005	6	5462	1.098499
2006	13	6028	2.156603
2007	14	6128	2.284595
2008	9	6235	1.443464
2009	6	6706	0.894721
Total	88	52946	1.66

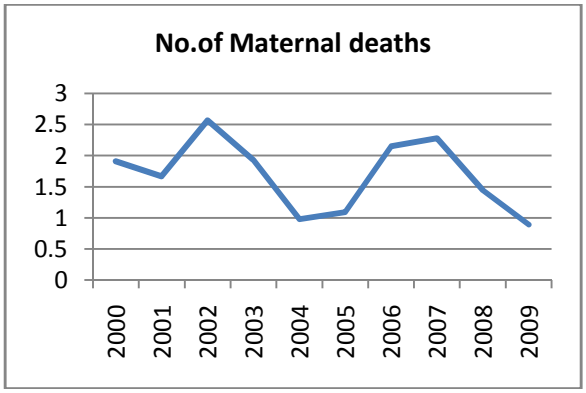

Table 1 shows the yearly distribution of maternal deaths and number of live births. The yearly maternal mortality rate is shown in graph no. 1. Average maternal mortality ratio is 1.66/1000 live births over a period of this decade. Maximum Maternal mortality was in the year 2007which is 2.28 /1000 live births. From year 2000 to 2009, over the period of 10 years there were 88 maternal deaths amongst 52948 live births so the maternal mortality rate is 1.66 /1000live births for 10 years.

Table 2: Age wise distribution

Sr no	Agewise distribution	No. of maternal deaths	Percentage
1	<20	09	10.23
2	20 – 24	34	38.63
3	25 – 29	26	29.55
4	30 – 34	12	13.63
5	35 – 39	04	4.55
6	≥ 40	03	3.41
	Total	**88**	**100**

Table no. 2 shows the age wise distribution of the number of maternal deaths. Maximum number of maternal deaths, 38.63% (34) were observed between age group 20 to 24 years. This is followed by age group 25 to 29 years with 29.55% (26) maternal deaths.

Table 3: Area of residence

Sr no	Area of residence	No. of maternal deaths	Percentage
1	Urban	21	23.86
2	Rural	67	76.16

Table no.3 shows that 76.16% mothers were form rural area while 23.86% mothers were from urban area.

Table 4: Status of referral

Sr no	Status of referral	No. of maternal deaths	Percentage
1	Referred	22	25
2	Not Referred	66	75

Table no. 4 shows that 25% (22) mothers were referred from other centers while 75% (66) admitted at first time in this institute

Table 5: Stage on admission

Sr no	stage on admission	No. of maternal deaths	Percentage
1	Critically ill	81	92.05
2	Stable	07	07.96

Table no.5 shows that 92.05% (81) patients were critically ill at the time of admission while only 7.96% (7) were stable at admission time. Importance of seeking medical help timely and timely referral to higher centre is highlighted by this finding.

Table 6: ANC registration

Sr no	ANC registration	No. of maternal deaths	Percentage
1	Registered	14	15.91
2	Not Registered	74	84.09

It was seen in this study that 84.09% (74) mothers died were unregistered for antenatal care and only 15.91 %(14) mothers were received antenatal care. This highlights the need of registration for antenatal care. It also shows the need for more strengthening of antenatal care facility at all health care levels.

Table 7: Pregnancy outcome

Sr no	Pregnancy outcome	No. of maternal deaths	Percentage
1	Live birth	40	45.45
2	Still birth	27	30.68
3	IUD	17	19.32
4	Abortion	4	04.55

Table no. 7 shows the outcome of pregnancy. 45.45% (45) mothers delivered live baby. Still births were observed in 30.68% (27) cases. Intrauterine deaths in 19.32%(17) cases while abortions were present in 4.55% (4).

Table 8: Cause of death

Sr no	Cause of death	No. of maternal deaths	Percentage
1	Direct	68	77.27
2	Indirect	20	22.73

Table 9: Cause of death

Sr. no	Cause of death	No. of maternal deaths	Percentage
1	ABRUPTIO PLACENTAE	8	9.09
2	ACUTE FULMINANT HEPATITIS	1	1.14
3	amanemia + CCF	1	1.14
4	ANASTHETIC COMPLICATION	1	1.14
5	ANTEPARTUM ECLAMSIA	16	18.18
6	ANTEPARTUM hemorrhage (Placenta previa)	3	3.42
7	CEREBRAL MALERIA	1	1.14
8	Dic	1	1.14
9	HAEMORHAGE D/T V MOLE	1	1.14
10	INTRA PARTUM ECLAMPSIA	2	2.27
11	POST ABORTAL SEPSIS UNSFE ABORT	2	2.27
12	POST PAR. DILATED.CARDIOMYOPATHY	1	1.14
13	POST PARTUM ECLAMSIA	16	18.18
14	POSTABORTAL SEPSIS	1	1.14
15	PPH	6	6.82
16	PULMONARY EMBOLISM	4	4.55
17	PUPERAL SEPSIS	6	6.82
18	RHD + MSMR+ PERICARDIAL EFFUSION	1	1.14
19	RHD + MSMR+ PH	1	1.14
20	RUPTURED UTERUS	1	1.14
21	SEVERE ANAEMIA	11	12.50
22	VIRAL HEPATITIS	3	3.41

Table no. 8 shows the direct and indirect causes of maternal mortality. Direct causes was found in 77.27% (68) mothers while indirect causes were seen in 22.73% (20) mothers. Eclampsia is the major cause of maternal mortality in this study. 38.63% (34) mothers died because of ecclampsia. It was seen that deaths due to antepartum ecclampsia and post partum ecclampsia were equal ,each contributing 18.18 % (18) maternal deaths while intrapartum ecclampsia was seen in 2.27% (2) cases. Most of these patients were received in comatose state with uncontrolled hypertension and were referred with inadequate dose of magnesium sulfate. This results indicate the need for early diagnosis of preeclampsia during antenatal care and referring patients to higher health care institutes with proper dose of MgSO4. Obstetric haemorrhage is the second most common cause of maternal mortality. In all 26.61% (19) mothers died because of obstetric haemorrhage. Abruptio placentae was cause of death in 9.09%(8) mothers, atonic PPH in 6.82% (6), placenta previa in 3.42% (3) mothers, while haemorrhage due to vesicular mole and rupture uterus was culprit in 1.42% (1) mothers each. Sepsis is the third most common cause of death. 8.95% (8) mothers died because of sepsis . Unclean delivery practices is the main factor leading to this complication. 6.68% (6) mothers died because of puerperal sepsis while post abortal sepsis was observed in 2.27% (2) mothers. Out of 88 deaths 22.73% (20) were related to indirect cause. Anemia being the major killer responsible for 13.64% (12) deaths followed by pulmonary embolism in 4.55% (4) cases. Need of iron and folic acid supplementation , dietary counseling and screening and treatment of anemia in antenatal period is seen in this study. Infections particularly viral hepatitis was observed in 3.47% (3) cases. Infection with malarial parasite was seen in 1.14% (1) case.

Combine table for table no 2 to 7

Sr no	Associated factors	Variables	No. of maternal deaths	Percentage
1.	**Agewise distribution**	<20	09	10.23
		20 – 24	34	38.63
		25 – 29	26	29.55
		30 – 34	12	13.63
		35 – 39	04	04.55
		≥ 40	03	03.41
2.	**Area of residence**	Urban	21	23.86
		Rural	67	76.16
3.	**Status of referral**	Referred	22	25.00
		Not Referred	66	75.00
4.	**stage on admission**	Critically ill	81	92.05
		Stable	07	07.96
5.	**ANC registration**	Registered	14	15.91
		Not Registered	74	84.09
6.	**Pregnancy outcome**	Live birth	40	45.45
		Still birth	27	30.68
		IUD	17	19.32
		Abortion	04	04.55