Original Article

Social correlates and causes of maternal mortality in tertiary care hospital Latur, Maharashtra

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Abstract

Background: Maternal death is a tragic situation as these deaths are not caused by disease but occurred during or after natural process. It one of the leading cause of death of women of reproductive age in many parts of world. Most maternal deaths and pregnancy complications can be prevented if women have access to good quality health care. **Objectives:** To study social correlates, outcome of pregnancy, causes and risk factors associated with maternal mortality. **Method:** Retrospective analysis of maternal deaths case sheets of 2011 and 2012 in Government Medical College and Hospital Latur were retrieved and variables such as age place of residency, occupation, parity, booking status, pregnancy outcome were studied. Chi-square test was applied. **Results:** (58.9%) maternal deaths were in 19-24 yrs age group and rural area (82.36%). (47.17%) of each were from landless labourers and household workers, (52.94%) were illiterates, (20.58%) were unbooked. (67.7%) were primigravida,(67.64%) were in postpartum,(44.11%) of each were live births and intrauterine deaths, (88.4%) were due to direct obstetric, (11.6%) due to indirect causes .Antepartum and postpartum haemorrhage was leading cause of death (38.2%). **Conclusion:** Timely recognition of the problem, early referral and skilled care at medical facility will help to decrease high maternal mortality ratio.
Keywords: Maternal mortality, Septicaemia, Pregnancy outcome, live birth, Post partum haemorrhage, Home delivery.

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INTRODUCTION

In the absence of an adequate registration system and complete medical certification of causes of deaths little information can be gathered about the causes of death. Major source of this information is hospital statistics. Government of India launched "National Rural Health Mission" on 5th April 2005 for period of 7 years (2005-2012). The mission seeks to improve rural health care delivery system. one of the goal to be achieved by NRHM is to reduce maternal mortality ratio to 100/100000 live births by providing accessible, affordable, accountable, effective and reliable primary health care and by reducing the gap in rural health care through creation of cadre of of Accredited Social Health Activist (ASHA) who will create awareness on health and will mobilised pregnant women for early registration of pregnancy, to attend antenatal care adequality and will motivate women for institutional delivery. NRHM also emphasises strengthening of infrastructure. "Risk approach and primary health care are steps in the right direction to reduce maternal mortality and morbidity. Despite of best antenatal care some women may develop complications without warning signs and require emergency care. E.O.C. and adequately staffed first referral units for emergency care is, therefore, a high priority. Equally important is an attack on social and cultural factors such as ignorance, illiteracy, poverty and prejudices inherent in sociocultural milieu pregnancy inherent in sociocultural. Hospital data have some limitations as it doesn't have a catchment area so it provides only numerator. Despite of limitation it is basic and primary source of information about diseases prevalent in the community. A study on

hospital data defiantly provides information on distribution of diagnosis, association between different diseases. So the present study was done to find out Social correlates and causes of maternal mortality in tertiary care hospital Latur Maharashtra, with maternal death case sheets. Pattern of causes of maternal mortality are similar in most of the counties but distribution of causes differ somewhat from region to region.

MATERIALS AND METHODS

Retrospective analysis of maternal deaths case sheets of two year i.e. 2011 and 2012 in Medical record department of Government Medical College and Hospital Latur were retrieved and variables such as age place of residency, occupation, parity, booking status, pregnancy outcome, time interval between admission and death, causes of death and risk factors associated with death were studied. Chi-square test was applied to determine to level of significance.

RESULTS

In present study maximum maternal deaths (58.9%) were in 19-24 yrs age group followed by 29.4 % in 25 -29 yrs age thus 88.3 were in 19-29 yrs of age group. Majority of deaths were from rural area (82.36%). 47.17 % of each deaths were from landless labourers and household work and only 5.8% were in service group. More than ½ (52.94%)were illiterates ,23.52% of each were educated up to primary and secondary level education. 20.58% pregnancies were unbooked. Majority of women (67.7%)were primigravida and 2.9% were grand multigravida . 3% of deaths took place within 1hr of admission and maximum deaths (38.3%)took place within 12hrs of admission followed by 29.4% during 25 to 165 hrs of admission . 84.4% of deliveries took place in hospital and 8.8% were home deliveries and 5.8% in PHC and sub centre. Most of deaths (67.64%) were in postpartum period and 20.58% were during pregnancy and 11.76% were during labour. Maximum (44.1%) deaths were in ICU followed by 35.3% in postnatal and in 5.9% antenatal ward. 2.9% were brought in hospital on point of death as they took place in casualty. Out of 34 perinatal outcomes, 44.11% of each was live births and intrauterine deaths, 8.9% were stillbirths and 2.9% were deaths due to abortions. Out of 34 maternal deaths ,30 deaths (88.4%) were due to direct obstetric causes and 4 (11.6%) were due to indirect causes .Ante partum and post partum haemorrhage was leading cause of death (38.2%) followed by Hypertensive disorders of pregnancy (26.5%) and sepsis was responsible for 23.52%. indirect obstetric causes were responsible for 11.6%.

Table 1: Distribution of women according to socio demographic characteristics

Characteristics	No. of maternal deaths (n)	Percentage (%)	Chi Square
Age		(n= 34)	
<19 yrs	0	0	
19 - 24 yrs	20	58.82	
25 - 29 yrs	10	29.41	
30 – 34 yrs	3	8.8	26.00
35 yrs & above	1	2.9	
Area of residence		(n=34)	
Urban	6	17.64	14.235
Rural	28	82.36	
Occupation		(n=34)	
Landless labourers	14	41.17	
Cultivators	4	11.76	
Household work	14	41.17	36.941
Service	2	5.8	
Education		(n=34)	
Illiterate			
Primary education	18	52.94	
Secondary education	8	23.52	
Higher secondary education	8	23.52	19.176
	0	0	

1.1Chi Square = 26.00 df 3 Highly Significant
1,2 Chi Square = 14.235 df 1 Significant
1.3 Chi Square = 36.941 df 3 Highly Significant
1.4 Chi Square = 19.176 df 3 Significant

Table 2: Distribution of maternal deaths by delivery related Characteristics

Characteristics	No. of maternal deaths (n)	Percentage (%)	Chi Square
Antenatal registration		(n=34)	
Registered (booked)	27	79.41	11.765
Un-registered (unbooked)	7	20.58	
Gravida		(n=34)	
Primi	23	67.64	
Gravida 2	6	17.64	34.471
Gravida 3	4	11.76	
Gravida 4	1	2.9	
Time interval from admission to death			(n=34)
0 – 1 hrs	1	2.9	
2 – 12 hrs	12	35.29	
13 – 24 hrs	6	17.64	11.00
25 – 165 hrs	10	29.41	
7 days and above	5	14.7	
Place of delivery		(n=34)	
Hospital	28	82.35	39.455
Home	3	8.82	

PHC	1	2.9	
Subcentre	1	2.9	
Stage of pregnancy at the time of death			(n=34)
Ante partum	7	20.58	
Intra partum	4	11.76	18.412
Post-partum	23	67.64	
Place of Death		(n=34)	
ANC Ward	2	5.88	
Casualty	1	2.9	
ICU	15	44.11	23.353
Labour Room	4	11.76	
PNC Ward	12	35.29	
Perinatal Outcome		(n=34)	
IUD	15	44.11	
Live birth	15	44.11	49.273
Still born	3	8.82	
Abortion/Miscarriage	1	2.9	

2.1 Chi Square = 11.765 df 1 Significant, 2.2 Chi Square = 34.471 df 3 Highly Significant, 2.3 Chi Square = 11.00 df 4 Not Significant, 2.4 Chi Square = 39.455 df 2 Highly Significant, 2.5 Chi Square = 18.412 df 2 Significant, 2.6 Chi Square = 23.353 df 4 Highly Significant, 2.7 Chi Square = 49.273 df 3 Significant

Table 3: Causes of maternal deaths (n=34)

Cause of Death	No. of maternal deaths (n)	Percentage (%)
Direct cause		(n=30)
Ante partum Haemorrhage	2	5.88
Post Partum Haemorrhage	11	32.35
Hypertensive Disorder of Pregnancy	9	26.47
Sepsis	8	23.52
Indirect cause		(n=4)
Hepatitis	1	2.9
Heart disease	1	2.9
Cerebral malaria	1	2.9
Viral encephalitis	0	0
5. Anaemia	1	2.9

DISCUSSION

The level of maternal mortality is a sensitive index of the prevailing health conditions and general socioeconomic development of a community. According to the international classification of Diseases, maternal death is "The death of women while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes (WHO1977)." In most developing countries, women of reproductive age (15 to 49 yrs) constitute a little more than one fifth of the total population. These women are exposed repeatedly to the risk of pregnancy and child bearing and under existing socioeconomic conditions and the inadequacy of medical and health facilities are at great risk of morbidity and mortality from causes related to pregnancy. The death of the women who, in most developing countries, plays the principle role in the rearing of children and the management of family affairs is a significant social and personal tragedy [2]. With prevailing custom of early marriage in rural area ,majority women present with their pregnancy in the age group of 19-24 yrs and contribution of maternal deaths to the total female mortality in reproductive age group is very high (36.4%)[3]. Maximum deaths(55.27%) reported by Vidyadhar B. Bangal et al[3] in the age group of 19-24 yrs were nearly similar to present study (58.9%) but (15.79 %) deaths below 19 yrs and over 30 yrs in his study was different finding than present study as no deaths below 19 yrs of age and less percentage (11.7%) over the 30 yrs of age was finding of present study. Maximum (88.3%) deaths in present study were in 19 to 29 yrs age group, similar was finding of Biswajit Paul (72.1%)[4], Puri etal (71.53%)[5] in 21-30 yrs and (11.54%) in above 30 yrs age but different finding was below 20 yrs of age group (16.92%). Rashmi Singh et al[6] also reported maximum deaths (56.54%) in 21 to 30 yrs age group but (22.49%) in 31 to 40 yrs were more than present study (11.6%). Nusrat Nisar, Nisar Ahmed[7] (61.1%) and Anisa Fawad et al[8] (73.07%) found maximum deaths in advanced age i.e. above 29 yrs of age. (40%) of deaths in the 19 -24 yrs and (30%) in 24-29 yrs found by Tayade et al[9] was similar but (30 %) in the 30-34 age group was more than the present study. The Indian traditions of early marriage and early pregnancy may be responsible for this distribution. In present study maximum maternal death (82.36%) were from rural area Bhatia Jagdish[2] also found (80.8%) in rural area while Vidyadhar B. Bangal et al[3] and Tayade et al[9] had (100%) death from rural area but Rashmi Singh et al[6] found lower percentage (67.17%) from rural area. In present study maximum (41.7%) deceased women were housewives and landless labourers (41.7%), cultivators and service women were (11.8%) and (5.8%) respectively. Vidyadhar B. Bangal et al[3] reported landless labourers (47.36%), household work (36.84%), cultivators (10.52%) and service women (5.26%). Majority of women (52.94%) were illiterate and (23.52%) each were educated up to primary and secondary education, similar finding was reported by Vidyadhar B. Bangal et al[3] where he found (57.9%) illiterate (21.05%) each with primary and secondary education. Biswajit Paul et al[4] found nearly half women (46.5%) were illiterate and (27.9%) had education secondary level. Rashmi Singh et al[6] and Anisa Fawad et al[8] and Tayade et al[9] also found more maternal deaths among illiterate (57.75%), (74.34%) and (80%)

respectively. Kullima AA, et al[11] stated illiteracy as significant indicator of maternal death. Pregnancy, child birth is generally regarded as entirely as women's entity. Older women especially, in rural families take decisions regarding utilisation of antenatal services and place of delivery and their words are hardly challenged. It is well known fact that antenatal clinic is the best mean to recognise risk factors of dangerous direct causes of maternal deaths[7]. In present study (79.42%) were booked pregnancies , Vidyadhar B. Bangal et al[3] and Nusrat Nisar, Nisar Ahmed[7] found similar percentages of booked pregnancies in their studies (71.06%) and (73.9%) respectively. Biswajit Paul[4] reported only (58.1%) book pregnancies, Puri et al[5] reported very less (1.54%) booked pregnancies. Rashmi Singh et al[6] (85%), Tayade et al[9] (70%) found high percentage of unbooked pregnancies. Lack of seeking antenatal care was significant determinant of maternal mortality[11]. In present study maximum (67.64%) maternal deaths were found in Post partum period of pregnancy, (17.6%) in third trimester of pregnancy, (11.7%) in second trimester of pregnancy and (2.9%) were in first trimester of pregnancy, Vidyadhar B. Bangal etal [3]found maximum (39.47%) deaths in third trimester, (31.57%) in post partum period,(23.68%) in second trimester and(5.26%) in first trimester which were different from present study. Most of the authors found maximum deaths in multigravida[3,5,6,9], but Nusrat Nisar, Nisar Ahmed[7] reported most of the deaths (62.5%) in grand multipara. Grand multiparity accounted for significant numbers of maternal deaths by Kullima AA, et al[11]. Anisa Fawad et al[8] reported (37.17%) in primipara, (28.2%) in multipara and (34.6 %) in grand multipara. The health care facility under study is tertiary care referral centre of District level teaching hospital and pregnant women with sever morbidity and pre-existing complications that too in critical and moribund conditions are referred for management. High risk women delivered at home, subcentre, PHC ,private hospital and sub district level hospital are referred to hospital for delivery or after delivery for management of complications ,creating a "Hawthron bias" Tayade et al[9] so the incidence and proportion of complication seen is probably very different from what occurs in community. Tayade etal[9] reported that (20 %) died within 1 hr (higher than the present study3%), (50%) within 2-24 hrs similar to present study (52.9%) and it becomes apparent that many of deaths that occurred could have been avoided if they were transferred earlier, further highlighting the need for adequate and quick transport facilities[9]. Mamady Cham et al[10] stated that 27 women of 32 maternal death were delayed in reaching appropriate medical facility due to lack of transport , prolonged transport and seeking care at more than one facility. Vidyadhar B. Bangal et al[3] found (81.57%) deaths in delivered mothers and (15.78%) in undelivered and (2.63%) death in abortion and (31.57%) in postpartum period. While in present study (67.64%) deaths were postpartum and (20.58%) were Antepartum and (11.76%) were intrapartum deaths. Puri et al[5] found postnatal deaths (63.08%) and antenatal deaths (36.92%), Nusrat Nisar, Nisar Ahmed[7] reported (57.7%) deaths after delivery and (41.7%) were pregnant at the time of death. Tayade et al[9] in his study found (30%) postpartum deaths and (40%) Antepartum deaths. In present study (44.1%) of were live births, (44.1%) were intrauterine deaths, (8.9%) were still births and (2.95%) deaths were due to abortion, Nusrat Nisar, Nisar Ahmed[7] reported (41.7%) were live births and (15.3%) were still births. Tayade et al[9] also found (30%) were IUDS and (26%) were live births and (10%) were still births. In present study maximum (82.4%) were hospital delivery and (8.8%) were home deliveries and in (2.9%) place of delivery was PHC and subcentre, Vidyadhar B. Bangal et al[3] reported that maximum deaths (64.51%) have occurred who delivered at tertiary care centre. Nusrat Nisar, Nisar Ahmed[7] reported that most of the deliveries (31.9%) took place at tertiary care while only (15.3%) deliveries were home confined and (4.21%) each at PHC and private clinic. In present study (41.11%) each was intrauterine deaths and live births (8.82%) were stillbirths and (2.9%) were abortions. Nusrat Nisar, Nisar Ahmed[7] found that (41.7%) were pregnancy at the time of death while (57.7%) died after delivery. Outcome of delivery in (41.7%) was live baby and (15.3%) resulted in IUD/Stillborn baby, Tayade et al[9] reported IUD (30%), live birth (20%) and still born (10%) and (40%) were undelivered. In present study direct causes were responsible for (88.4%) of maternal deaths and (11.6%) were due to indirect causes. Among direct causes haemorrhage was leading cause (38.3%)followed by Hypertension (26.5%) and sepsis (23.6%). Among indirect causes Hepatitis, cerebral malaria, heart diseases and Anaemia were accounted (2.9%) each. Vidyadhar B. Bangal et al[3] found (50%) each direct and indirect cause. Haemorrhage caused (21.5%) (less than the present study), Eclampsia (10.52%), embolism (10.52%) and sepsis (7.89%) and indirect causes were hepatitis (21.05%), heart disease (13.15%), cerebral malaria (7.89%), viral encephalitis (5.26%) and anaemia (2.63%). The pattern of causes in hospital based study is quite different from that seen in community. In most hospital based studies in India direct cause were responsible for (51%) to (82%) of maternal mortality[4]. The present study also reported (88.4%) deaths due to direct causes Biswajit Paul[4] reported (67.7%) of maternal deaths due to direct causes, where Hypertensive disorder of pregnancy (32.6%), Haemorrhage and sepsis (14%) each were

responsible. Malaria (9.3%), anaemia (7%) were common indirect causes, Puri et al[5] reported 55.39% due to direct and (40%) due to indirect and (4.61%) due to unrelated diseases and direct causes were sepsis (23.84%), haemorrhage (12.30%) Eclampsia and PIH (17.69%) and embolism (1.53%). Globally (25%) of all maternal deaths are due to haemorrhage, (13%) of maternal deaths due to Eclampsia and PIH and (15%) due to sepsis, hepatitis (13.84%), anaemia (13.05%), respiratory diseases (8.46%), heart diseases (1.54%), surgical cause (1.54%), CNS (0.77%) and enteric fever (0.77%). Rashmi Singh et al[6] accounted (66.56%) direct causes where toxaemia (24.01%), sepsis (17.93%) and haemorrhage (16.11%), anaemia (15.81%) were present and indirect causes were responsible for (17.85%) maternal deaths other direct causes were (8.52%). Direct causes reported by Nusrat Nisar, Nisar Ahmed[7] were haemorrhage (41.6%), Hypertensive disorder of pregnancy (27.8%), obstructed /prolonged labour (5.6%) and to be a major cause of indirect deaths is Heart diseases (4.2%), hepatitis, anaemia, unidentified (2.8%) each. Anisa Fawad et al[8] reported highest maternal mortality due to Eclampsia (28.2%), septicaemia (20.5%), haemorrhage (19.23%), pulmonary embolism (14.10%) and anaemia (5.12%) respectively. CCF, Hepatic encephalopathy, anaphylactic reaction accounted (3.84%) and ruptured uterus (1.28%). Tayade et al[9] found (30%) PIH, (30%) pulmonary embolism, one woman had septic abortion, (40%) anaemia in indirect causes. Kullima AA, et al[11] found that Antepartum haemorrhage (10%)and Eclampsia remains the leading cause accounting (46.4%) of the maternal deaths followed by sepsis and PPH contributing (17%) and (14.3%) respectively, medical disorders of pregnancy and abortion related (7.1%) and (6.2%) respectively, (4.5%) each due to ruptured uterus and obstructed labour.

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