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RESEARCH ARTICLE

EPIDEMIOLOGY OF AUTOPSY AND THEIR MANNER AMONG REPRODUCTIVE AGED FEMALES IN VARANASI AREA (INDIA)

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ABSTRACT

Introduction: In our presenting study we consider reproductive age of women 15 to 45 year. Prevalence of unnatural death among reproductive aged females significantly affects community. Study data included in our study are not sufficient and like tip of iceberg because only unnatural death and recorded victims are included.

Aim of the study: by presenting study to aware about status of prevalence of unnatural death in reproductive aged group of women to upgrade autopsy center, improve education in rural area, health delivery system.

Material and Method: The present retrospective study has been conducted for the period of 5 consecutive years i.e. 2009 to 2013 based on autopsy record of the unnatural death cases resulting from electrocution deaths. During study period total no. of unnatural Death cases were 10195 and deaths among reproductive age were 2268. These cases were brought to the Department of Forensic Medicine, IMS, BHU, Varanasi and have been analyzed retrospectively.

Result: The year-wise distribution of deaths in women of reproductive age shows an increasing trend from 2009 to 2012 i.e. 19.23%, 21.90%, 23.04%, 24.17% respectively and in 2013 little decreases to 22.73%. Most common cause is burn (58 %). Marital statuses show that 79.6% are married, 15.4% are unmarried. Most of the death victims are in 15 to 25 year age group. Predominant method of accidental death were caused by road traffic accident (67%). rural habitat are most common locality 2039 (89%) followed by urban locality 140 (6.2%) and unknown habitat cover 89 (3.9%).

Discussion: Death among women of reproductive age has a marked effect on resources and management outcomes in the family and community. An epidemiological assessment of causes of death among women of reproductive age is needed for increased awareness of health problems in this population group, allocating public-health resources and appropriately developing strategies for prevention.

Conclusion: Analysis of data for retrospective study suggests that age, sex, habitat, marital status, religion and manner of death significantly affect community.

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INTRODUCTION

A woman's reproductive period is roughly from 15 to 45 years. A woman's married at 15 and living till 45 with her husband is exposed to the risk of pregnancy for 30 years, and give birth to 15 children's, but this maximum is rarely achieved. In India, women of the child bearing age contribute 22.2%. Global observation show that in developed regions maternal mortality ratio averages at 13 per lack live birth, in developing regions

the figure is 440 for the same number of live birth. Study of these factors is an important aspect of social obstetrics, while accepting the influence of environmental and social factors on human reproduction; social obstetrics has yet another dimension that is the influence of these factors on the organization, delivery and utilization of obstetric services by the community (Parks 2009). The study of biologic difference between sex has emerged as a distinct scientific discipline. The integration of woman's health into internal medicines and other specialties has been accompanied by novel approaches to health care delivery, including greater attention to patient education and involvement in disease prevention and medical

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decision making (Harrison's 2008). Women in the reproductive age group (range 12–49 years) comprise a vulnerable section of our society as they are confronted with menstrual and pregnancy-related stress factors in addition to the stressors prevalent in the general population. Moreover, unnatural deaths in women of reproductive age indirectly have a serious psychological and social impact on the family and community (Jagadish Rao Padubidri *et al.*, 2013). WHO: Demographic definitions of infertility - an inability of those of reproductive age (15–49 years) to become or remain pregnant within five years of exposure to pregnancy (www.googletagmanager.com). Over 600000 maternal deaths occur each year worldwide. In India, many women die due to pregnancy-related complications and those who survive suffer from severe maternal morbidity. Maternal death rate in India was 1000 per 100000 live births in 1959 and it decreased to 301 per 100000 live births in 2003. Albeit, the risk of death from complications of pregnancy has decreased during past few decades, it continues to haunt Obstetricians. Maternal death has been used traditionally as a measure of quality of health care in a community. It is hard to find precise reporting of maternal death because this requires information about deaths among women of reproductive age, pregnancy status at or near the time of death and the medical cause of death. All three components can be difficult to measure accurately, especially in settings where deaths are not comprehensively reported. Review of autopsy reports can prove to be one of the useful sources to identify pregnancy-related deaths and elucidating the emerging trends (Bardale and Dixit 2010).

Pregnancy and childbirth-related complications are the leading cause of disability and death among women of reproductive age in developing countries. The death of a woman in childbirth can threaten the survival of her entire family. The development of the newborn baby, who may have survived, as well as that of other young children in the family, is endangered by the death of the mother. Women who die due to pregnancy-related causes are in the prime of their lives and are responsible for the health and well-being of their families. Many women shoulder a double burden of helping to support the family by working outside the home and taking full responsibility for household duties and child care. Yet, despite this vital role played by women in society, the high level of maternal mortality in many poor countries is strong evidence of the neglect of the health needs of women. The number of women who die each year as a result of being pregnant is not precisely known. Underreporting and misclassification of maternal deaths are universal. A large proportion of those who die are poor and live in remote, rural areas and, thus, their deaths go unreported. In regions of the world with the highest rates of maternal mortality, deaths and their causes are rarely recorded. Although hospital data indicate high rates of mortality, most of the available information is incomplete and unreliable. Moreover, relying solely on hospital or other health care facility data omits deaths that occur at home or during transport. To decide whether the death of a woman is a maternal death, the timing of the death in relation to the woman's pregnancy status, along with the cause of death, must be known. Often, this information is not readily available. Misclassification of maternal deaths happens when the cause of death on the death certificate does not reflect the true

relationship between a woman's pregnancy and her death. The combination of these factors leads to reported rates of maternal mortality that are unreliable and tend to underestimate the true magnitude of this major public health issue, making international comparisons using these data less meaningful. Reported rates of maternal mortality underestimate the true magnitude of the problem by as much as 70%. Even in countries where most deaths are medically certified, maternal mortality can still be significantly underestimated. For example, a study conducted in the United States by the Centers for Disease Control and Prevention (CDC) estimated that the number of deaths attributed to pregnancy and its complications from 1982 to 1996 is actually 1.3 to 3 times the rate based solely on vital statistics data. Special efforts have to be made to obtain reliable data on maternal mortality.

In the past, demographic studies focused generally on the socioeconomic determinants of maternal health, and epidemiologic surveys tended to concentrate on the biological processes of mortality and morbidity. More recently, both scientific disciplines are becoming increasingly aware of the need to integrate their work; together they may provide improved health information needed to describe the magnitude and identify the determinants of maternal mortality and morbidity, and to evaluate the impact of health interventions in a population. To date, data on maternal mortality and morbidity have been routinely collected following a consistent methodology of collection in only certain places in the world. To make improvements in morbidity and mortality trends, baseline data need to be collected so that the impact of interventions can be more accurately assessed. These assessments help to focus the attention and resources of policymakers and decision makers by bringing to light the magnitude of women's deaths related to pregnancy. This module introduces

- 1) The magnitude and causes of maternal mortality and morbidity;
- 2) Definitions of the measures of maternal mortality and morbidity;
- 3) Methods for measuring maternal mortality;
- 4) Epidemiologic studies to address maternal mortality and morbidity;
- 5) Implications of research and collected data on maternal mortality and morbidity. By studying maternal deaths, we can begin to understand what actions need to be taken at the community level, within the formal health care system, and in other social sectors to improve prevention strategies for reducing maternal morbidity and mortality. Measures of maternal health should not focus solely on mortality. Because the factors that cause maternal deaths clearly overlap with those that cause maternal morbidity, interventions aimed at reducing maternal mortality will, in the process, reduce maternal morbidity as well (Divya 2003).

MATERIALS AND METHODS

Present study is carried out at forensic medicine department, Institute Of Medical Sciences, Banaras Hindu University, Varanasi. Relevant information and subjective data like age, sex, habitat, marital status and manner of death among reproductive age group of victims have been collected from

medico legal autopsy register. Data are analyzed retrospective for periods of five consecutive years. Cases were included in death among reproductive age group on the basis of confirmation by investigating officer and corroborative finding at medico legal examination.

RESULTS

Figure 1: Show that prevalence unnatural deaths among reproductive age group at 15 to 45 year were 2268 cases and are 22.25% of total autopsy conducted in 5 consecutive years from 2009 to 2013. The year-wise distribution of deaths in women of reproductive age shows a progressive increasing trend from 2009 to 2012 i.e. 19.23%, 21.90%, 23.04%, 24.17% respectively and in 2013 little decreases to 22.73%.

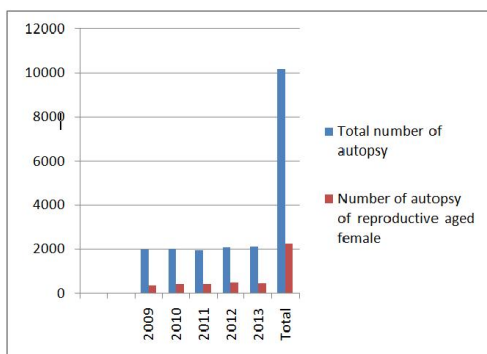


Figure 1. Prevalence of deaths among reproductive age group of women

Table 1. Reproductive age group of women by marital status

Age group in year	Marital status										Total	%
	MR	%	%T	UM	%	%T	UN	%	%T			
15-25	792	44	68.22	337	96	29.03	32	29	2.76	1161	51	
26-35	723	40	93.65	9	3	1.17	40	36	5.18	772	34	
36-45	292	16	87.16	4	1	1.19	39	35	11.64	335	15	
Total	1807	79.6		350	15.4		111	4.8		2268	100	

Note: MR-Married, UM-Unmarried, UN-Unknown. $X^2=367.42$, $df=4$, $p < 0.001$

Table 2. Distribution of sociodemographic variable and manner of death among reproductive age group of women

Age group	A	%	S	%	H	%	N	%	UN	%	T	%
15-25	151	40.48	114	61.29	18	40.91	29	34.12	849	53.73	1161	51.19
26-35	106	28.42	55	29.57	14	31.82	28	32.94	569	36.01	772	34.04
36-45	116	31.10	17	9.14	12	27.27	28	32.94	162	10.25	335	14.77
$X^2 = 143.01$, $df = 8$, $p < 0.001$ Marital status												
MR	262	70.24	139	74.73	33	75.00	51	60.00	1322	83.67	1807	79.67
UM	79	21.18	42	22.58	7	15.91	7	8.24	215	13.61	350	15.43
UN	32	8.58	5	2.69	4	9.09	27	31.76	43	2.72	111	4.89
$X^2 = 186.98$, $df = 8$, $p < 0.001$ Habitat												
R	329	88.20	156	83.87	38	86.36	55	64.71	1461	92.47	2039	89.90
UR	11	2.95	26	13.98	2	4.55	4	4.71	97	6.14	140	6.17
UN	33	8.85	4	2.15	4	9.09	26	30.59	22	1.39	89	3.92
$X^2 = 24.55$, $df = 8$, $p < 0.001$ Religions												
HD	329	88.20	179	96.24	37	84.09	56	65.88	1521	96.27	2122	93.56
ML	11	2.95	3	1.61	3	6.82	2	2.35	39	2.47	58	2.56
UN	33	8.85	4	2.15	4	9.09	26	30.59	19	1.20	86	3.79
CH	0	0.00	0	0.00	0	0.00	1	1.18	1	0.06	2	0.09
T	373	16.45	186	8.20	44	1.94	85	3.75	1580	69.66	2268	100

$X^2 = 20.55$ $df = 8$, $p < 0.001$

Note: (A- Accidentals; S – Suicidal; H-Homicidal; N-Natural; U-Unknown, T-Total, R-Rural, UR- Urban, HD-Hindu, ML-M-Muslim, CH-Christian.)

Table 1: The distribution of unnatural death among reproductive age of women by marital status show that 79.6% was find married, 15.4% was unmarried and 4.8 % was unknown cases for which marital status not known. Most death is among 15 to25 year married age group are 44% followed by progressive decrease with increasing age. 15 to 25 year age group also common among unmarried group followed by cases are progressively decreased with age.

Table 2: Distribution of sociodemographic variable and manner of death among reproductive age group of women showed that among 17% accidental victims 40% were in the 15- 25 year age group and rest are in 26 to 45 year age group. 8% suicidal victims 61% were in the 15 to 25 year and remaining suicidal victims are in 26 to 45 year. Victims are homicidal 2%. Death in 85(3.7%) cases was natural mannered with a disease being the cause of death. Unknown cases are 70% in which manner of death cannot be ascertained but most of the death victim are in 15 to 25 year age group. Manner of death distribution by marital status showed that 139(75%) of suicidal victims were married, 42(23%) of the suicidal victims were unmarried and 5(3%) of the suicidal victims were unknown marital status. The distribution of habitat, rural habitat are most common locality 2039 (89%) followed by urban locality 140 (6.2%) and unknown habitat cover 89 (3.9%). Distribution of death among reproductive age group of women in 5 years with religions in which Hindu victims are 2122 (93.6%), Muslim victims are 58 (2.6%), Christians are 2 (0.1%) and 86(3.8%) victims in which religion not differentiated.

Table 3. Distribution of autopsy occurred in the reproductive aged females as per various cause of death and manner of death during 2009 to 20013

S.N.	Cause	A	%	H	%	N	%	S	%	U	%	T	%
1.	Burn	8	2	0	0	0	0	0	0	1308	83	1316	58.03
2.	Road Traffic Accident	252	67	27	63	0	0	0	0	9	1	288	12.70
3.	Poisoning	1	0	0	0	0	0	2	1	213	13	216	9.52
4.	Hanging	1	0	0	0	0	0	177	95	0	0	178	7.85
5.	Natural	0	0	0	0	83	98	0	0	0	0	83	3.66
6.	Railways	71	19	0	0	0	0	7	4	0	0	78	3.44
7.	Drowning	2	1	0	0	0	0	0	0	36	2	38	1.68
8.	Traumatic Asphyxia	11	3	0	0	0	0	0	0	0	0	11	0.48
9.	Electrocution	11	3	0	0	0	0	0	0	0	0	11	0.48
10.	Fall From Height	9	2	0	0	0	0	0	0	0	0	9	0.40
11.	Neck Injury	0	0	6	14	0	0	0	0	1	0	7	0.31
12.	Strangulation	1	0	5	12	0	0	0	0	0	0	6	0.26
13.	Firearm Injury	0	0	5	12	0	0	0	0	0	0	5	0.22
14.	Medical Negligence	2	1	0	0	2	2	0	0	0	0	4	0.18
15.	Other	5	1	0	0	0	0	0	0	1	0	6	0.26
16.	Unknown	0	0	0	0	0	0	0	0	12	1	12	0.53
Total		373	10	44	10	85	10	186	100	1580	100	2268	100

Table 3: Show that different cause of death and manner of death among reproductive age group in decreasing order, the most common cause is burn (58 %), 2nd most common is road traffic accident (13 %) and rare causes of deaths are i.e. bomb blast injury, hypothermia, infected wound, lightning, surgical alleged medical negligence, snake bite of each one case and cover total 6 case. The predominant method of accidental death were caused by road traffic accident (67%) followed by railways accident (19%).The preponderant method of suicide was by hanging 177 cases (95%) followed by railway track 7 cases (4%). Unknown manner of death mostly comprises burn victim 1308 (83%) followed by poisoning 213 (13%) in which manner of death can't be differentiated.

DISCUSSION

Prevalence of deaths

Prevalence of deaths among reproductive age groups of women in 5 year our presenting study were 22.25% but other study (Jagadish Rao Padubidri *et al.*, 2013; Anitha and Harish 2010-2013) show that it is comparatively low 14.8%.The year-wise distribution of deaths in women of reproductive age shows an increasing trend from 2009 through 2012 and in 2013 little decreases.

Reproductive age and marital status

The distribution of reproductive age group of women by marital status shows that married women are much more than unmarried women, in all age group early marriage and lesser decision-making capacity in marriage matter, early motherhood, repeated pregnancies, and lack of accessibility to family planning services, affect a woman's health and even life expectancy. The finding suggests that there is highly significant association between age group and marital status of the females ($P < 0.001$).

Manner of death

The most common manner of death in our study is unknown in which manner of death cannot be ascertained followed by

accident, suicide, natural and homicides was relatively less common. Other study contrast in this regard that most common manner is suicide³.This finding implicates that the potential strategies for improving the use of advanced autopsy technique, trained in forensic medicine expert and upgrading autopsy center, Safety education and prevention of accident, Health of women must focus on understanding and addressing the suicidal behavior. Other study show that the less number of transport accidents caused deaths (8.5%) among these reproductive-age women, making it the leading external cause of death⁸. The finding suggests that there is highly significant association between age group and marital status of the females ($P < 0.001$).

Habitat

The distribution of death among reproductive age group of women in 5 years inhabiting rural area are most common locality followed by urban locality and unknown habitat it is may be due to low level of education, dowry death, poor health facility. On the basis of this study, interventions such as improving education changing the health care referral structure or ensuring the presence of a trained birth attendant may have strong influences in reducing maternal mortality in this setting. The finding suggests that there is highly significant association between age group and marital status of the females ($P < 0.001$).

Religious

In our study religion basis distribution in which Hindu victims are most affected followed by Muslim victims are then Christians are 2 (0.1%) and 86(3.8%) victims in which religion not differentiated. This significant difference may be due to more population of Hindu's than of other religion in an area. Hinduism is more ambiguous regarding suicide: whilst ostensibly condemning self-harming behavior, it may be sanctioned for religious purposes (Ajit Pradhan 2013). The finding suggests that there is highly significant association between age group and marital status of the females ($P < 0.001$).

Cause of death

The leading cause of unnatural death among reproductive age group of women in 5 years study in this regions in decreasing order of frequency were burn, road traffic accident, poisoning, hanging these are the major cause of unnatural deaths and are also proved by other study (Jagadish Rao Padubidri *et al.*, 2013). Natural cause of death were uncommon forming 4% of the study and included lung infection (pulmonary tuberculosis, pneumonia), cardiac disease, septicemia.

Conclusion

- Unnatural deaths among reproductive age group at 15 to 45 year were 22.25% of total autopsy.
- Most common cause is burn (58 %), 2nd most common is road traffic accident (13 %).
- Marital status shows that 79.6% are married, 15.4% are unmarried.
- Accidental manner of death victims (40%) were most common and is in the 15- 25 year are most common age group.
- Manner of death distribution by marital status showed that 139(75%) of suicidal victims were married.
- The predominant method of accidental death were caused by road traffic accident (67%) followed by railways accident (19%).
- Rural habitat are most common locality 2039 (89%) followed by urban locality 140 (6.2%).
- Hindu victims are 2122 (93.6%), Muslim victims are 58 (2.6%).

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Conflict of interest

Nil

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Ethical clearance

The present study was approved by “Institutional Ethical Committee” of Institute of Medical Sciences, Banaras Hindu University Varanasi. All the information has been taken under consideration of medical ethical committee.

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