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EPIDEMIOLOGY OF UNNATURAL DEATH DUE TO SUSPECTED POISONING IN WOMEN IN VARANASI, INDIA

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ABSTRACT

Introduction: Unnatural deaths due to suspected poisoning in women have a serious psychological and social impact on the family and community. Sections 284, 299, 300, 304A, 324,326 and 328 of IPC deal with offences relating to the handling and administration of Poisonous substances.
Aims and Objective: To find out how death due to suspected poisoning affects incidence, age, sex, habitat, marital status, religion, manner of death, medico legal consequence and preventive measures.
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 records of the unnatural death cases resulting from suspected poisoning. During the study period, total numbers of unnatural death cases were 10195 and death due to suspected poisoning in female were 255. These cases were brought to the Department of Forensic Medicine, IMS, BHU Varanasi and have been analyzed retrospectively.
Result: The suspected poisoning in women constituted 2.50% of total autopsied cases. Male victims (71.54%) outnumbered females (28.46%) and maximum number of cases were in the age group of 21-30 years (45.10%). Among the cases whose marital status was known (194) i.e.21.65%, 0% cases were male and 100% were female. More cases (women) were from rural habitat (25.67%) than urban (1.67%). Hindus outnumbered 250 (27.90%) the Muslim. Manner of death 250 (27.90%) cases due to poisoning were suicidal.
Toxicology: science dealing with properties, actions, toxicity, fatal dose, detection, estimation, treatment and autopsy finding (in case of death) in relation the poisonous substances. Poison: It is a substance which if in introduced in the living body or brought into contact with any part thereof produce ill health or death by its constitutional or local effect or both[1]. Poisoning has be
Conclusion: Analysis of data for retrospective study suggests that age, sex, habitat, marital status, religion and manner of death significantly affect community.

INTRODUCTION

Poison used by man for murder and suicide as long as recorded history. The poisoner is a murderer who has gone through a long and deliberate of cold premeditation. The word toxicology is derived from the Greek word "TOXICONE" which was used as a poisonous substance to arrow head (Gautam Biswas, 2013). Common household poisons in India are insecticides and pesticides such as organ phosphorus, aluminum phosphide other poisons are corrosive, kerosene, cleaning agents. According to WHO 3 million acute poisoning case with 2,20,000 deaths occur annually, of these 90 % of poisoning occur in developing countries (Narayan Reddy, 2012). The toxic may manifest itself immediately (acute toxicity) or after a prolonged period (chronic toxicity). Both suicidal and homicidal case of poisoning are more common in India than in the western countries, owing to the facility with which poisons can be obtained from any bazaar (in spite of certain restrictions that have been brought about for sale). Accidental poisoning is now on an increasing (Mathiharan d*et al*., 2005). In suspected case of poisoning vomitus, clothing soaked with vomitus, remaining food and drinks their containers should be submitted for analysis (Murty *et al*.,

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2013). The autopsy in a suspected case of poisoning can be among the most difficult of problems faced by a forensic pathologist not in technical procedure of the examination but in the final evaluation of all the available information. Considerable proportion of those die from suspected poisoning will have died in hospital and it is of prime importance that the medical records be obtained and studied before the autopsy begins (Pekka Saukko and Bernard knight, 2004). Medico legal aspects of Poison sections 284, 299, 300, 304A, 324,326 and 328 of IPC deal with offences relating to handling and administration of Poisonous substances. As per Indian law, administration of any substance with the intention of causing hurt or death is punishable (indianarmy.nic.in/writereaddata/ documents/medico_legal.pd). Suicide conceptually can be defined as "an act with a fatal outcome that is deliberately initiated and performed by the deceased person itself, in the knowledge or expectation of its fatal outcome, the outcome being considered by the actor as instrumental in bringing about desired changes in consciousness and/or social (Rezaeian, 2012) Death due to suspected poisoning mean during autopsy, inquest history and grass autopsy finding suggestive but there is no confirmative test. Rapid development in science and technology and rapid growth in agriculture and industrial sector has led to increase in the incidence of poisoning, taking away a lot of precious human life.

Aims and Objectives

The present study was conducted to find out:

1. The aim of this study is to find out how, deaths due to suspected poisoning affect incidence, age, sex, habitat, marital status, religion, manner of death and its medico legal consequence in the district of Varanasi ,Uttar Pradesh
2. To provide further data for the characterization of fatal poisonings, because there is a scarcity of such information from Varanasi, India

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 of various causes of death victims have been collected from medico legal autopsy register. Data are analyzed retrospective for periods of five years. Cases were included in group of various cause of death on the basis of confirmation by investigating officer and corroborative finding at medico legal examination.

RESULTS

Table 1: Regarding prevalence of unnatural death due to suspected poisoning from January 2009 through December 2013 a total of 10195 autopsies were done of which 255 involved suspected poisoning in women, constituting 2.50% of total autopsy cases, in these 5 consecutive years prevalence more or less static and average 20%.

Table 2: Regarding age ranged from 0 to 80 years. Fatal poisonings were seen most commonly in the 21-30 years (45.10%) followed by 11-20 year (22.35%), and 31-40 year (18.43%) age groups, while rarely observed in the oldest and youngest age groups. Of the cases, 641 (71.54%) were males and 255 (28.46) were females. The male-female ratio is 2.51:1 in our study.

Table 1. Prevalence of unnatural death due to suspected poisoning in women's

Total no. of autopsy conducted in 5 year 2009 to 2013	Total number of autopsy	%	Number of autopsy due to suspected poisoning in women's	% of autopsy due to suspected poisoning
2009	1986	19.48	36	14.12
2010	2025	19.86	59	23.14
2011	1974	19.36	64	25.10
2012	2081	20.41	55	21.57
2013	2129	20.88	41	16.08
Total	10195	100.00	255	2.50

Table 2. Age and sex wise distribution of unnatural death due to suspected poisoning

Age (in year)	Male cases		Female cases		Total cases	
	NO.	%	NO.	%	NO.	%
0-10	10	1.56	3	1.18	13	1.45
11-20	89	13.88	57	22.35	146	16.29
21-30	232	36.19	115	45.10	347	38.73
31-40	144	22.46	47	18.43	191	21.32
41-50	86	13.42	11	4.31	97	10.83
51-60	49	7.64	13	5.10	62	6.92
61-70	25	3.90	7	2.75	32	3.57
>71	6	0.94	2	99.22	8	0.89
Total	641	71.54	255	28.45	896	100.00

Table 3: Regarding marital status most of the victims were unknown marital status were 641(71.54%) male, and 17(1.90%) are female. But among known marital status were married, 194 (21.65%) cases, of which 0% cases are male and 21.65% are female.

Table 3. Distribution of unnatural death due to suspected poisoning in relation to marital status in women

Marital Status	Male		Female		Total	
	NO.	%	NO.	%	NO.	%
Married	0	0.00	194	21.65	194	21.65
Unmarried	29	3089.66	44	4.91	73	8.15
Unknown	612	68.30	17	1.90	629	70.20
Total	641	71.54	255	28.46	896	100

Table 4: Regarding habitat most of the rural habitats were found in 783(87.39%) cases, among these male cases 553(61.72%) and female cases are 230(25.67%).Urban habitats were found only cases 55(6.14%),among these male case are 40(4.46%) and female cases are 15(1.67%).And rest are unknown habitats 58(6.47%).

Table 4. Incidence of unnatural death due to suspected poisoning in with habitat in women's

Habitat	Male cases	% of cases	Female cases	% of cases	Total cases	% of total cases
Rural	553	61.72	230	25.67	783	87.39
Urban	40	4.46	15	1.67	55	6.14
Unknown	48	5.36	10	1.12	58	6.47
Total	641	71.54	255	28.46	896	100

Table 5: Regarding religions in our study Hindus outnumbered 250(27.90%) than Muslim, among these male cases 577(64.40%) more common than female 250(27.90%).

Muslim cover with 18(2.01%) among these male 13(1.45%) and female 3(0.33%) cases.

Table 5. Distribution of unnatural death due to suspected poisoning with religion in womens

Sr. No.	Religion	Male cases	% of cases	Femal e cases	% of cases	Total cases	% of cases
1.	Hindu	577	64.40	250	27.90	817	91.18
2.	Muslim	13	1.45	3	0.33	18	2.01
3.	Christian	4	0.45	2	0.22	5	0.56
4.	Unknown	47	5.25	0	0.00	56	6.25
	Total	641	71.54	255	28.46	896	100.00

Table 6: Regarding manner of death 861(96.09%) cases of death due to poisoning were suicidal in nature among these male case are 611(68.19%) and female cases are 250(27.90%). Accidental in nature cases are 33(3.68%) among these male case are 30(3.35%) and female case are 3(0.33%). Homicidal case are only 2(0.22%) and in all are female.

Table 6. Distribution of manner of death in women

Manner of death	Male cases		Female cases		Total cases	
	NO.	% of cases	NO. of cases	% of cases	NO. of cases	% of cases
Suicidal	611	68.19	250	27.90	861	96.09
Accidental	30	3.35	3	0.33	33	3.68
Homicide	0	0.00	2	0.22	2	0.22
Total	641	71.54	255	28.46	896	100.00

Table 7: Most of the fatal poisoning were maximum during summer season 113(44.31%) cases followed by rainy with 73(28.68%), and with winter 69 (27.06%) cases.

Table 7. Distribution of seasonal variation in women

Season	No. of cases	% of cases	Male cases	% of cases	Female of cases	% of cases
Summer (March-JUNE)	368	41.07	255	39.78	113	44.31
Rainy (July-October)	279	31.14	206	32.14	73	28.63
Winter (Nov.-December)	249	27.79	180	28.08	69	27.06
Total	896	100.00	641	71.54	255	28.46

DISCUSSION

Prevalence

In our study prevalence of death due to suspected cases of poisoning in women constituting 2.50% of total autopsy cases which is significantly more than (1.39%) result of the other study (Mrinal Haloi *et al*., 2013) and in few studies (Recep Fedakar *et al*., 2008) the prevalence was little less than (6.16%). This difference in the incidence may be due to geographical variation in the population.

Age and Gender

In our study death due to suspected case of poisoning is common in 21 to 30 years age group (38.73%), followed by the age group 11 to 20 years is (22.35%), which goes in more than (33.33%) of another study (Mrinal Haloi *et al*., 2013), where most common age group is 20 to 29 years, other study (Michael G. Landen *et al*., 2014) show 35-44 year. Due to the fact that at this period they are by nature more stress towards job, emotional, aggressive, intolerant and irrational. The male-female ratio is 2.51:1 in our study, other similar study (Rezaeian, 2012) is 2.5:1, and another study (Mrinal Haloi *et al*., 2013) this ratio is less (1.66:1).

Marital status

Married outnumbered single similar to other study (Mrinal Haloi *et al*., 2013), because after marriage economic problem and behavior of family members results in frequent quarrels and familial disharmony leading to increased stress.

Habitat

Present study show that most women victims 230(25.67%) are from rural habitat, similar to other study[7] rural outnumbered 28(29.16%) due to bulk of population live in rural areas and agricultural activities are more prevalent. Most of the incidents took place in the residence, because agricultural insecticides used for suicidal act were available at their household.

Religions

In our study most of the women victims were Hindu 250 (27.90%) is similar to other study (Mrinal Haloi *et al*., 2013) 26(27.08%) because population of Hindu community is more in this study region.

Manner

Presenting study show that female victims suicidal manner more common 250 (27.90%) similar to other study (Mrinal Haloi *et al*., 2013) 33(34.37%) may be due to, family quarrel and unhappiness were the most common motive for suicide, as in nuclear families in which husband and wife is dependent on each other to a greater extent in all family matters are more prone to commit suicide. Male victims are more prone to Suicide manner (68.19%) than female, similar to other study (Lou M Gallagher *et al*., 2012) male: female's ratio 3:1 in all suicides. To approach manner of death role of the investigator (Barry K Logan, 2011) to secure the scene, document the scene, examine the scene including wastebasket, drawers, under furniture, storage.

Season variation

Seasonal study show that in women highest cases 113(44.31%) took place in summer, it prove other study (Mrinal Haloi *et al*., 2013) as this is the period of active agricultural activities when pesticide and insecticide are extensively used and also may be due to in this season more chance of dehydration result mood irritability result attempt suicide.

Conclusion

- Analysis of data for retrospective study suggests that age, sex, habitat, marital status, religion and manner of death significantly affect community.
- Although it seems that suspected poisoning occurs in low frequency in Varanasi, the possibility of under-enumeration and under-reporting of it must also be taken into account.

- Furthermore, a comprehensive prevention plan should be designed and implemented in order to tackle the root causes of suicide i.e. family disputes, unemployment plus addiction.
- The total suspected poisoning cases constituting 8.79% of total autopsy.
- Fatal poisonings were seen most commonly in the 21-30 year 45.10%.
- The female male ratio is 1:2.51 in our study.
- Most of the rural habitats were found in 230(25.67%) cases
- Hindus outnumbered 250 (27.90%) than Muslim.
- Most of the fatal poisoning were maximum during summer season 113(44.31%).

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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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