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## A Retrospective Study Profile Of Fatal Poisoning In A Tertiary Care Hospital Of Bengaluru Rural District.

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### ABSTRACT

Fatal poisoning is a significant public health issue, particularly in developing nations. Poisoning deaths are increasing daily due to accelerated industrialization and progress in agriculture sector. The purpose of this study is to determine the various parameters of fatal poisoning in the rural district of Bengaluru. This retrospective study was carried out in Department of Forensic Medicine, MVJ Medical College and Research Hospital a tertiary care hospital in Hoskote, Bangalore rural district with data obtained from fatal poisoning cases brought for post-mortem examination from January 2017 to December 2021. Identification of specific poisons were done with chemical examiner's report. Out of 280 cases, maximum number of cases were male (62.14%) in the age group of 21-30 years (35%). 78.92% belonged to Hindu religion and 74.64% were married victims. Maximum numbers of cases (56.07%) were recorded during daytime. 93.92% of cases were suicidal in nature with unknown reason being the most common motive (45%), followed by personal adjustment crisis (40%). Insecticides (53.92%) was the most common poison encountered, followed by Rodenticides (27.85%). Our study shows that health education, early referral, the establishment of toxicological units for the detection of poisons, and the provision of appropriate guidance for the management of poisoning cases at hospitals and primary health care facilities can help to reduce morbidity and mortality due to fatal poisoning.

**Keywords:** Fatal poisoning, Insecticides, Suicide, Mortality.

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## INTRODUCTION

Acute poisoning is a medical emergency and that significantly increases morbidity and mortality in India and globally. Poison is a substance which if administered by any route that causes injury to the body or death. Acute poisoning refers to exposure to the poisonous substance within a period of less than 24 hours [1]. NCRB (National crime records bureau) statistics of 2021, shows in India 41197 persons committed suicide by poisoning, of which 26674 persons committed suicide by consuming insecticides and 14523 persons consumed other poisons. Accidental poisoning contributes to 6% of deaths (23472) [2]. In India around 70% of rural households still depend primarily on agriculture for their livelihood [3]. Majority of the studies shows that insecticides and pesticides compounds are the most widely used agents for poisoning.

Statistically, acute poisoning deaths are little bit less than that of deaths due to road traffic accidents. It is astonishing that the number of deaths from road accidents is of great public concern compare to an almost equal number of deaths caused by poisoning. Because poisoning is a quiet weapon that is employed without any violence, and is a significant concern all over the world. Instead of hanging themselves or hurting themselves, a person chooses to die peacefully by ingesting poison [4].

In developing nations, accidental and suicide poisoning are greatly influenced by the cheap and easy availability of dangerous substances. The most frequent lethal poisons are organophosphates, organochlorines, aluminium phosphide, hydrochloric acid, and carbon monoxide. The majority of deaths occur due to exposure to organophosphates, and aluminium phosphide [5]. It is estimated that around 20% of global suicides are due to consumption of pesticides, most of which occur in rural agricultural areas in low- and middle-income countries [6].

So, this study has been aimed to determine the various parameters of fatal poisoning such as type of poisoning involved, the most vulnerable age group and their marital status with religion. A thorough knowledge regarding the type of poison chosen in a particular area is essential for the doctors in hospital practice and also help in imposing restrictions on the sale of those poisons and in preventing deaths.

## MATERIALS AND METHODS:

This is a retrospective study done at MVJ Medical College and Research Hospital a tertiary care hospital in Hoskote, Bangalore rural district. The study was commenced after obtaining approval from Institutional Ethics committee. Data was collected from the treatment history and medical records, inquest papers, autopsy reports and chemical examiners reports after getting approved by the institutional ethical committee. Discretion was maintained and details of fatal poisoning cases brought for post-mortem examinations from January 2017 to December 2021 has been collected.

Poisonings due to accidental, suicidal and homicidal intention was included in the study. However, cases of poisoning due to snake bite, scorpion sting, drug allergy and food poisoning were excluded from the study. Patients data such as age, gender, address, manner of death, number of agents causing poisoning, name of the causative agent, duration of stay in the hospital, previous poisoning history and cause of death are collected. The data obtained from this study was then analysed statistically using Statistical Package for the Social Sciences (SPSS 20) and the data was presented in the form of appropriate tables, computing descriptive statistics such as percentages.

## RESULTS

In the current study, a total of 280 fatal poisoning cases were retrospectively analyzed. Of these, majority of the cases were males 174 (62.14%) compare to females 106 (37.85%), and most of the fatal poisoning cases were in the age group of 21 to 30 years 98 (35%) followed by 31-40 years 69 (24.64%). It was noted that the maximum number of cases were seen among married victims 209 cases amounting to 74.64%, followed by unmarried victims 71 cases amounting to 25.35%. In this study, maximum number of cases i.e. 221 belonged to Hindu religion (78.92%), followed by Muslims 52 (18.57%) and Christians 7 (2.5%).

The present study shows that 93.92% of cases i.e. 263 were suicidal in nature. Accidental poisoning constituted 6.07% of cases i.e. 17 and none of cases were homicidal in nature. Majority (56.07%),

incidences occurred in day time (6 am to 6 pm) and almost one third (41.07%) in the night time (after 6 pm to before 6 am), in remaining (2.85%) cases, time of incidence was not known. The most common motive for death was found to be unknown reasons in 126 victims i.e. 45% of cases, followed by personal adjustment crisis in 112 victims i.e. 40% of cases. The most common poison encountered in this study was insecticide (151 cases – 53.92%), followed by Rodenticides in 78 cases – 27.85%.

## DISCUSSION

A total of 280 cases of fatal poisoning were retrospectively analysed during the studied period and identification of specific poisons were done with chemical examiner's report. In the present study, the maximum number of cases 174 were male (62.14%) and the rest 106 were female (37.85%). This is consistent with study conducted by B. Suresh Kumar Shetty et al, observed that males outnumbered females constituting 69.2% (n=90) and 30.8% (n=40) of cases respectively with a male-female ratio of 2.3:1 [7]. Similar findings were observed in the study conducted by Vidusha Vijay, Pradeep Kumar M.P<sup>8</sup>. Male preponderance could be accounted to the fact that males form the majority of population and are more often exposed to the stress of day today life, as well as to the occupational hazards than the females who are harassed by husband/in-laws commit suicide by poisoning.

In the current study, the maximum number of cases 98 were in the age group of 21-30 years (35%), followed by 69 cases in the age group of 31-40 years (24.64%). To meet academic challenges, job hunting, unachieved goals, marital conflicts, peer pressure, attraction towards opposite sex and unable to take independent life decisions can lead to commit suicide in younger age groups. Similar age group of fatal poisoning cases was reported by various studies [4, 8]. This study revealed the maximum number of fatal poisoning occurred in married persons 209 (74.64%). This finding is supported by the similar studies conducted by Dr.Kartik Prajapati et al [9], Dr.S.S.Sandhu et al [10] who reported that married persons outnumber the unmarried persons and constitute for over 62%, and 57.6% deaths respectively. Premature marriage, disloyalty, domestic violence, dowry demand and trouble with in- laws are common reasons. In this study, maximum number of cases 221 belonged to Hindu religion (78.92%), followed by Muslims (18.57%) and Christians (2.5%). This is supported by the study conducted by Gupta BD, Vaghela PC [11].

In our study, the percentage of cases on manner of death is revealed as suicidal deaths 93.92% (263 cases), accidental in 6.07% (17 cases) and none of cases were homicidal in nature. Easy availability and cost-effectiveness make the poisoning one of the commonest methods of committing suicide. B. Suresh Kumar Shetty et al<sup>7</sup> in their study revealed that intentional self-poisoning constituted 79.2% (103) of these deaths, followed by accidental consumption of poison (19.2%). No case of homicidal poisoning death was reported during the study period. It was noticed that the most common time of occurrence was daytime (157 cases), followed by night (115 cases) and in 2.85% (8 cases) of cases exact time of occurrence was not known. Considering the time of poisoning, study conducted by Shreemanta Kumar Dash et al [12] shows that the majority of cases (55.9%) were observed during the daytime, between 6 am to 6 pm.

The commonest reason for death was found to be unknown in 126 victims (45% cases), followed by personal adjustment crisis in 112 victims (40% cases). Rapid urbanisation and lifestyle changes will affect individual's personal, marital, social and financial disputes. Personal adjustment crisis include loss of dear ones, spouse rejection, adultery and quarrel with in-laws. Such findings were also observed by Anandabaskar N, Murugan R, et al [1], in their study. The most common poison encountered in this study was insecticides 151 cases, followed by rodenticides in 78 cases. Similar findings observed in the study by Shetty AK, Jirli PS, Bastia BK [13]. Agriculture is the primary occupation of many living in rural India, and insect damage to crops is a significant issue they deal with. Hence, farmers purchase and store pesticides including insecticides, rodenticides, herbicides, and fungicides in their homes. As a result, pesticides are a readily available poison for suicide in India's rural areas.

## CONCLUSION

Given that the number of poisoning cases rises every year, it is natural that younger generations have fallen victim to it. Although there are limitations on the selling of medications and a drug control system in India, insecticide sensitivity cannot be disregarded. The legislation governing the availability of drugs and poisons needs to be strengthened, but even more crucial are preventive measures like drug education programmes, raising youth awareness of the dangers of drugs, promoting poison information centres, establishing separate toxicological departments in hospitals, and modernising outlying health

facilities to handle poisoning emergencies. A sizable number of deaths can be avoided by providing neighbourhood first aid kits, improved training for doctors, quicker access to hospitals, and making sure that enough supplies of antidotes and necessary medical equipment are always on hand. Poison information centres are centralised in a special way.

**Table 1: Age distribution with sex**

AGE	MALE	FEMALE	TOTAL
11-20	18(6.42%)	12(4.28%)	30 (10.71)
21-30	67(23.92%)	31(11.07%)	98 (35%)
31-40	43(15.35%)	26(9.28%)	69 (24.64%)
41-50	26(9.28%)	21(7.5%)	47 (16.78%)
51-60	13(4.64%)	11(3.92%)	24 (8.57%)
>61	7(2.5%)	5(1.78%)	12 (4.28%)
Total	174(62.14%)	106(37.85%)	280 (100%)

**Table 2: Marital status**

MARITAL STATUS	MALE	FEMALE	TOTAL
Un married	43(15.35%)	28(10%)	71(25.35%)
Married	131(46.78%)	78(27.85%)	209(74.64%)
Total	174	106	280 (100%)

**Table 3: Religion**

RELIGION	MALE	FEMALE	TOTAL
Hindus	138(49.28%)	83(29.64%)	221(78.92%)
Christians	5(1.78%)	2(0.71%)	7(2.5%)
Muslims	31(11.07%)	21(7.5%)	52(18.57%)
Total	174	106	280(100%)

**Table 4: Manner of death**

Manner	Male	Female	Total
Suicide	162(57.85%)	101(36.07%)	263(93.92%)
Accident	12(4.28%)	5(1.78%)	17(6.07%)
Homicide	0	0	0(0%)
Total	174	106	280(100%)

**Table 5: Incidence of day and night time of poisoning**

Time	MALE	FEMALE	TOTAL
Day(6am-6pm)	97(34.64%)	60(21.42%)	157(56.07%)
Night(6pm-6am)	71(25.35%)	44(15.71%)	115(41.07%)
Not known	6(2.14%)	2(0.71%)	8(2.85%)
Total	174	106	280(100%)

**Table 6: Reasons for Suicidal poisons**

Reason	MALE	FEMALE	TOTAL
Unknown	87(31.07%)	39(13.92%)	126(45%)
Financial distress	14(5%)	8(2.85%)	22(7.85%)
Personal adjustment crisis	61(21.78%)	51(18.21%)	112(40%)
Chronic alcoholism	4(1.42%)	2(0.71%)	6(2.14%)
Psychiatric disorders	8(2.85%)	6(2.14%)	14(5%)
Total	174	106	280(100%)

**Table 7: Type of poisoning**

POISONING	MALE	FEMALE	TOTAL
Insecticides	95(33.92%)	56(20%)	151(53.92%)
Rodenticides	49(17.5%)	29(10.35%)	78(27.85%)
Herbicide	15(5.35%)	13(4.64%)	28(10%)
Household agents	11(3.92%)	6(2.14%)	17(6.07%)
Drugs	4(1.42%)	2(0.71%)	6(2.14%)
Total	174	106	280(100%)

**Ethical Clearance:** A prior approval was obtained from the Institutional Ethics Committee, MVJ medical college and Research hospital.

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