

# Epidemiotoxicological Profile of Fatal Poisoning Cases Autopsied at a Tertiary Care Hospital

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## Abstract

Poisoning is a major public health problem worldwide with thousands of death occurring every year and most of the cases are being reported from developing countries. The present study includes all the cases of poisoning or suspected poisoning subjected for autopsy at the Department of Forensic Medicine and Toxicology, Basaveshwara medical college and hospital, chitradurga, Karnataka during the period 1<sup>st</sup>january 2022 to june 2023 in which it was seen that poisoning accounted for 19.9% of autopsies. 24 Males (66.6%) and 12 females (12%) in the age group 21-30 years were commonly affected. Many victims were married males. Majority of cases were suicidal in manner (94.4%) and were from middle class social status (41.1%). The commonest poisoning was organophosphorus compound.

**Key words:** Poisoning, ingestion; victims

## Introduction

Toxicology is a science which deals with the toxicity of substances. The substance inflicting a toxic effect may be a drug, an insecticide, a pesticide or any chemical substance in the environment. In fact every substance is theoretically capable of producing toxicity and every drug is potentially a poison for routine purposes<sup>1</sup>. Poisoning is one of the most common cause of medical emergency visits and leading cause of disease and death in India and global public health concern. It is one of the most common method of committing suicide among both males and females in India. It is estimated that more than 50,000

people die every year from toxic exposure in India.<sup>2,3</sup>. It is one of the preventable cause of death.

## Aims and Objectives:

To know the distribution of poisoning cases among different age, sex, frequently used poisonous substance, incidence among literate and illiterate individuals, different socioeconomic status.

## Materials and Methods

It is a retrospective study of all the cases autopsy done in the department of Forensic Medicine and Toxicology, Basaveshwara medical college and

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hospital, chitradurga, Karnataka during the period 1<sup>st</sup> January 2022 to June 2023 with the history of poisoning. Also includes all fatal cases which were admitted at Basaveshwara medical college and hospital, and died later. Information was collected through hospital records, police records, chemical analysis reports, by direct interaction with victim or relatives and finding of autopsy which are presenters like age, sex, marital status, literacy status type of poison, mode of poisoning, manner of poisoning post mortem findings and chemical analysis results. In all cases where samples gave negative results categorized poison as unknown. The data of certain variables were collected and analysed in latest SPSS regarding age, sex, socioeconomic status, marital status, commonly abused poison. The statistical analysis of data from this study was carried out using relevant tables as well as descriptive statistics such as percentage.

### Observations and Results

A total of 36 cases of fatal poisoning cases were subjected to autopsy examination. The incidence of poisoning and various cases are shown in table no.1. 36 cases of recorded death were due to poisoning during the study period and following observations were made. Total male affected were 24(66.6%) and female were 12(33.3%) (Table 2). The study revealed that more number of persons affected were in the age group of 21-30 years followed by 31-40, followed by 41-50 and least affected age group was 0-20 years (table no.3).

It is evident that 22 victims (41.6%) were of medium socioeconomic status (table no.4). The study revealed that more number of victims were from rural area 66.6% (table no.5).

The study revealed that more number of victims were literate 55.6% (table no.6).

The study revealed that more number of victims were unmarried 63.6% (table no.7).

The study revealed organophosphorus compounds is the most prevalent poison involved in the study population 66.6% (table no.8).

The study revealed that most of the cases were of suicidal in nature 99.4. (table no.9).

**Table 1: Showing various types of cases**

Types of cases	N=	%
Natural	5	2.7
Hanging	22	11.9
Poisoning	36	19.5
RTA	61	33.1
Drowning	8	4.3
Snake bite	6	3.2
Electrocution	5	2.7

**Table 2: Showing sex distribution of fatal poisoning cases**

Sex	N=	%
male	24	66.6
female	12	33.3

**Table 3: Showing age distribution of fatal poisoning cases**

age	frequency	percentage
0-20	2	5.5
21-30	13	36
31-40	10	27.7
41-50	5	13.8
>50	6	16.6

**Table 4: Showing socioeconomic status of fatal poisoning cases**

status	N=	%
Low	9	36
Medium	15	41.6
high	12	33

**Table 5: Showing domicile distribution of fatal poisoning cases**

domicile	N=	%
rural	24	66.6
urban	12	33.3

**Table 6: Showing literacy status of fatal poisoning cases**

literacy	N=	%
literate	20	55.5
illiterate	16	44.4

**Table 7: Showing marital status of fatal poisoning cases**

Marital status	N=	%
married	13	36.1
urban	23	63.8

**Table 8: Showing commonly abused poison by victims**

Poison abused	N=	%
Organophosphorus	20	55.5
Carbamates	3	8.3
Pyrethroid	2	5.5
Paraquat	3	8.3
Corrosives	3	8.3
Rat poison	3	8.3
unknown	4	11.1
total	36	

**Table 9: Showing manner of poisoning cases**

manner	N=	%
Accidental	34	94.4
Suicidal	2	5.5
homicidal	0	0

## Discussion

Out of total of 184 autopsies, poisoning accounted for 19.5% of cases. Grag V and Verma S<sup>4</sup> in their study on trend of poisoning in rural area of South West Punjab found 12.15% of total admitted MLC cases were of poisoning, Findings were similar to those obtained by Naik S B Alva M, Shetty D<sup>5</sup> in Karnataka. Gupta B D et al<sup>6</sup> in their study on profile of fatal poisoning in and around Jamnagar observed incidence medico legal autopsies ion poisoning cases to be 15.98% and Gargi J, Tejpal H R et al<sup>7</sup> in their retrospective autopsy study of poisoning cases in Northern region of Punjab observed 11.60% incidence.

In the current study most of the victims were males 66.6% and females accounted for 33.3% Which is true in case of several studies also. Job C<sup>8</sup>, Mohanty A C et al<sup>9</sup>, Harish D et al<sup>10</sup>, Behra A et al<sup>11</sup>, Aggarwal N K et al<sup>12</sup> observed higher incidence of poisoning in males then females. This observation may be attributed to stress, unemployment greater number

of various responsibilities and stress due to bad health of earning member of the family and inability to cope up with them triggers suicides.

Higher incidence of poisoning was observed in age group of 21 to 30years in 36% cases followed by 31 to 40 years in 27.24% of fatal poisoning cases in the present study. Similar observations were made by shetty A K et al<sup>13</sup>, Zariwala R et al<sup>14</sup>, Behra A et al<sup>11</sup>, Job C<sup>8</sup>, Gupta B D et al<sup>6</sup>, Gargi J, Tejpa H R et al<sup>7</sup>, and Dhanya S P et al<sup>15</sup>. Kohli A & Banerjee KK<sup>16</sup>, from Delhi observed higher incidence of poisoning in the age group 13-24 years (53.50%) and 25-36 years (22.40%). Ramesh K N observed that more than 60% of victims were between the age of 12 and 20 years while 20 to 29 years age group accounted for 30.2% of incidence of poisoning. Sunanda N et al<sup>5</sup> found that highest incidence of poisoning 58% was seen in the age group 12 to 25 years followed by in 26 to 45 years age group that is 28%. Higher incidence of poisoning cases have been observed in unmarried individuals may be because of loneliness and health issues.

Marriage of any person is a new transitory phase in any one's life which adds to responsibilities and psychological pressure on any person. Stressful situations like disharmony existing between family members, dowry, financial problems, depression, and ongoing physical and psychological changes, responsibility of running the family etc these factors trigger suicidal attempt.

Petrovic B et al<sup>17</sup>, in their study on the influence of marital status on epidemiological characteristics suicides in the South East party of Serbia found married women committing more suicides by poisoning than those who are unmarried. Sunanda N et al<sup>5</sup> found that highest incidence of poisoning that is 66% was seen in unmarried females followed by married males. In the present study it was observed that as per police Report suicidal poisoning was reported in 94.4% fatal poisoning cases followed by accidental in 5.5% cases .Similar observation were made by Zariwala R et al<sup>14</sup>observed major chunk were of suicidal cases 62% cases. Gupta B D et al<sup>6</sup>, Kohli A &Banerjee K K 16, Murty O P et al<sup>18</sup>, Shetty A K et al<sup>13</sup>, Harish D et al<sup>10</sup> and Haparin J H et al<sup>19</sup>observedthat suicide make a major part of the study

that suicidal cases varies from 40% to 70% followed by accidental and homicidal cases. Accidental exposure can result from improper use of chemicals at work or play, product mislabeling, label misreading, mistaken identification of unlabeled chemicals, uniformed self medication and dosing error by nurses, parents, pharmacists, physicians and elderly.

### Conclusion

Following are the most conclusion from the study

Most of the victims were males which is 24 number (66.6%) and most of the persons affected were in the age group of 21-30 years It is evident that most of the victims (41.6%) were of medium socioeconomic status. The study revealed that more number of victims were from rural area. The study revealed that more number of victims were literate 55.6%. The study revealed that more number of victims were unmarried 63.6%. The study revealed organophosphorus compounds is the most prevalent poison involved in the study population 66.6%. The study revealed that most of the cases were of suicidal in nature (99.4%).

As organophosphorus compounds are easily available to public these should be curtailed by stringent implantation of laws for sellers and buyers. Public awareness regarding the different poisons which are likely cause of accidental poisoning is necessary. There must be availability of poison information centers.

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