

Study of autopsy profile of deaths due to poisoning at a tertiary hospital

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Abstract

Background: It is important to know the nature and severity of poisoning for medicolegal purpose, in order to take appropriate preventive measures as well as in planning and management of critically ill acute poisoning cases. Present study was aimed to study autopsy profile of deaths due to poisoning at a tertiary hospital. **Material and Methods:** Present study was retrospective, case record study conducted in cases underwent medicolegal autopsy with history of poisoning. **Results:** During study period, among all cases of postmortem, poisoning cases were 315, amounting to 8.61 % of all cases. In present study, we noted that majority of case were from 21-40 years (38.73%) followed by 41-60 years (32.38%). Majority of cases were males (60.95%) as compared to females (39.05%). Majority cases survived for less than 1 day period (73.01%) and were suicidal (78.41 %). In present study, most common poison used were Organo-phosphorous compounds (60.63%), Others (Carbamate, Pyrethroid, Sulphuric acid, Paraphenylenediamine, Benzodiazepine, etc.) (9.21%), Alcohol (8.25%), Aluminum phosphide (6.67%), Carbonates (6.35%), Zinc phosphide (5.40 %) and Corrosive acid poison (3.49%). In present study, common external autopsy findings were characteristic Odour (33.33%), Frothing at mouth and nose (36.51%) and Cyanosis of Extremities (38.41%). While internal findings were Generalized visceral congestion (100.00%), Pulmonary edema (57.78%), Cerebral edema (56.51%), Necrosis of spleen (24.76%), Fatty infiltration of liver (11.11%) and Myocardial necrosis (10.79%). **Conclusion:** Common factors associated with poisoning are age-group 21-40 years, males, survived for less than 1 day period, suicidal, done with organo-phosphorous compounds associated with characteristic Odour, frothing at mouth and nose and Cyanosis of Extremities during autopsy.

Keywords: Poisoning, pesticides, suicidal, organo-phosphorous compounds.

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INTRODUCTION

Poison can be defined as a substance causing harmful effects when taken accidentally or intentionally into a living organism. Almost all substances may be harmful at some and right dose differentiates a poison from a remedy.^{1,2} Acute poisoning is a major contributing factor to mortality and morbidity worldwide, with the incidence

of mortality varying by the cultural characteristics of different societies.³ Poisoning cases can be suicidal, accidentally and rarely as homicidal purpose. Accidental poisoning occurs in manufacturers, users, children of users, packers, sprayers and due to contamination of food grains mixed with insecticides preserved for seedling purposes. Pesticide poisoning in India is highly prevalent due to the widespread use of pesticides for agricultural and household activities. Other poisoning agents include household agents, envenomation and drugs. It is observed that agricultural or household pesticides and drugs are taken intentionally, whereas intake of corrosives, kerosene and other miscellaneous agents as well as animal bites happen accidentally.^{4,5} It is important to know the nature and severity of poisoning for medicolegal purpose, in order to take appropriate preventive measures as well as in planning and management of critically ill acute poisoning cases. Present study was aimed to study autopsy profile of deaths due to poisoning at a tertiary hospital.

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MATERIAL AND METHODS

Present study was retrospective, case record study conducted in the Department of Forensic Medicine, Andhra Medical College, Vizag, India. Study approval was taken from institutional ethical committee. Strict confidentiality was kept for identity and medicolegal data of autopsy cases. Cases underwent medicolegal autopsy with history of poisoning were considered for present study. While autopsy done in certain cases of food poisoning, snake bite and any other insect bite envenomation and deaths due to idiosyncratic reaction to the drugs were not considered during study. A detailed

information regarding the age, sex, time of consumption of poison, type of poison, mode of transport to the hospital, reason for poisoning, amount of poison taken, route of entry into the body, time interval between the consumption and hospitalization, outcome and other parameters were noted in study proforma. Case related details such as history, relevant information, post mortem findings (from the autopsy reports), inquest reports and chemical analysis reports (Forensic Science Laboratory) were noted. Data was collected and compiled using Microsoft Excel, statistical analysis was done using descriptive statistics.

RESULTS

During study period, among all cases of postmortem, poisoning cases were 315, amounting to 8.61 % of all cases. In present study, we noted that majority of case were from 21-40 years (38.73%) followed by 41-60 years (32.38%). Majority of cases were males (60.95%) as compared to females (39.05%).

Table 1: General characteristics

Characteristics	No. of cases	Percentage
Age (years)		
≤ 20	39	12.38%
21 - 40	122	38.73%
41 - 60	102	32.38%
≥ 61	52	16.51%
Gender		
Male	192	60.95%
Female	123	39.05%

Majority cases survived for less than 1 day period (73.01 %) and were suicidal (78.41 %).

Table 2: Other characteristics

Characteristics	No. of cases	Percentage
Survival period		
<6 hours	62	19.68%
6-24 hours	168	53.33%
1 day to 1 week	64	20.32%
> 1 week	21	6.67%
Manner of death		
Suicidal	247	78.41%
Accidental	43	13.65%
Homicidal	2	0.63%
Don't know	23	7.30%

In present study, most common poison used were Organo-phosphorous compounds (60.63%), Others (Carbamate, Pyrethroid, Sulphuric acid, Paraphenylenediamine, Benzodiazepine, etc.) (9.21%), Alcohol (8.25%), Aluminum phosphide (6.67%), Carbonates (6.35%), Zinc phosphide (5.40%) and Corrosive acid poison (3.49%)

Table 3: Suspected poison

Suspected poison	No. of cases	Percentage
Organo-phosphorous compounds	191	60.63%
Others (Carbamate, Pyrethroid, Sulphuric acid, Paraphenylenediamine, Benzodiazepine, etc.)	29	9.21%
Alcohol	26	8.25%
Aluminum phosphide	21	6.67%
Carbonates	20	6.35%
Zinc phosphide	17	5.40%
Corrosive acid poison	11	3.49%

In present study, common external autopsy findings were characteristic Odour (33.33%), Frothing at mouth and nose (36.51%) and Cyanosis of Extremities (38.41%). While internal findings were Generalized visceral congestion (100.00%), Pulmonary edema (57.78%), Cerebral edema (56.51%), Necrosis of spleen (24.76%), Fatty infiltration of liver (11.11%) and Myocardial necrosis (10.79%).

Table 4: Autopsy findings in poisoning fatalities (n=582).

Autopsy findings	No. of cases	Percentage
External		
Characteristic Odour	105	33.33%
Frothing at mouth and nose	115	36.51%
Cyanosis of Extremities	121	38.41%
Autopsy findings internal		0.00%
Generalized visceral congestion	315	100.00%
Pulmonary edema	182	57.78%
Cerebral edema	178	56.51%
Necrosis of spleen	78	24.76%
Fatty infiltration of liver	35	11.11%
Myocardial necrosis	34	10.79%

DISCUSSION

Poisoning has been a major clinical and public health problem in LMIC, including India, for decades although the burden has often been ignored.⁶ Despite the underreporting of poisoning deaths in India due to weaknesses in death certification, stigma associated with suicide, and lack of clinical and laboratory services to aid diagnosis, we found an alarming number of deaths in the Indian literature.⁷ Amita S *et al.*,⁸ studied 2719 cases, highest incidence was in the range of 14-40 years, with males (57%) outnumbering females (43%). The most common mode of poisoning was suicidal (53%), followed by accidental (47%). The route of exposure was mainly oral (88%). Dermal (5%), inhalation and ocular exposure contributed 7% to the total. The highest incidence of poisoning was due to household agents (44.1%) followed by drugs (18.8%), agricultural pesticides (12.8%), industrial chemicals (8.9%), animals bites and stings (4.7%), plants (1.7%), unknown (2.9%) and miscellaneous groups (5.6%). Gupta BD⁹ studied 132 cases of poisoning, majority of victims were married, Hindu, males from rural area and low socio economic group. Majority of victims died within 1-6 hours of consumption of poison. Suicidal cases were for more commoner than accidental one. No case of homicidal poisoning was detected. On chemical analysis, insecticide was the commonest poison (72.44%) followed by aluminum phosphide (14.28%) and acid (0.63%). Rajani VB *et al.*,¹⁰ studied 165 cases of poisoning, majority victims were male from rural area. Peak incidence was observed in the age group of 21-30 years. Majority of deaths were suicidal, followed by accidental however no homicidal poisoning were detected. Organ phosphorus insecticide was the prime culprit among all poisons. In study by Gupta P *et al.*,¹¹ among 243 poisoning cases were observed in the age group between

21-30 years (39.09%). The populations with possibility of exposure to poisoning in their occupations were farmers (41.5%), housewives (31.2%) and students (18.8%). The maximum numbers of poisoning cases reported were due to organophosphorus (57.1%). The number of intentional poisoning cases (91.9%) were more when compared to accidental poisoning cases (5.2%).

Nigam *et al.*,¹² reported that maximum incidence of OP Poisoning is seen in persons engaged with agricultural fields (39.60 %) followed by house wives (20 %) and students (16.85 %). Garg *et al.*,¹³ reported that aluminum phosphide is leading cause of poisoning (36.8%) followed by insecticides (31.6%) in South-West Punjab. B. Maharani noted that, among 150 cases, 148 cases were of intentional poisoning and two cases were of accidental poisoning. In all the cases the route of exposure was oral. Males (92 cases) outnumbered females (58 cases) and 101 cases were married. Peak occurrence was in the age group of 21-30 years (47 cases). Occupation wise poisoning was commonly found among male laborers (18.66%) and farmers (13.33%) followed by house wives (28%) and students (16.66%). 147 cases (98%) were Hindus. More cases were reported during summer season (36%) and day time (80%). Organophosphorus was the commonest agent (58.66%). A death from poisoning has been ruled Suicidal due to the history, suicide note and other such circumstantial evidences. Adults have been found to be the greatest number of cases in suicidal poisoning and children have been found mostly to be the victims of accidental poisoning. The accidental poisoning is mainly due to the ignorance of the parents keeping the poison within the reach of children, misinterpretation of the chemical by children and sometimes even by adults under intoxication.^{15,16} It is customary to emphasize the role of psychiatric consultant in most of the background situations

most important to death from poisoning, Strict legal enforcement in selling and handling of agrochemicals is the need of the hour, and establishment of poison detection centers and early management of poisoning cases at all hospitals, primary health care centers could considerably minimize the morbidity and mortality due to poisoning

CONCLUSION

Poisoning in India is a socioeconomic problem and reason behind the rise in a number of cases is due to the agriculture-based economy, poverty, unsafe practices, illiteracy, ignorance and easy availability of pesticides. Common factors associated are age-group 21-40 years, males, survived for less than 1 day period, suicidal, done with organo-phosphorous compounds associated with characteristic Odour, frothing at mouth and nose and Cyanosis of Extremities during autopsy.

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