ORIGINAL RESEARCH PAPER

Pattern of poisoning in au topsy cases reported to civil hospital Ahmedabad- a retrospective study

Nayak Manjit[1], Rathva Vanraj[2], Khubchandani HT[3]

ABSTRACT

*Introduction: Poisoning is prevalent in all parts of India but trend of poisoning varies from place to place. The word poison has evolved from the Latin word 'potion' which means to drink for health but by the time, the definition has been changed to its present form as any substance which when administered, inhaled or ingested is capable of acting deleteriously on human body. **Materials and methods**: The retrospective study has been carried out in the department of forensic medicine and toxicology, B. J. Medical College, Civil Hospital, Asarva, Ahemdabad during the period of 01 year from January 2017 to December 2017 to find out the distribution according to alleged history of poisoning as per inquest, condition of gastric mucosa, smell from stomach contents, viscera preservation, analytical result and distribution of cases according to cause of death. **Results:** 48.67% autopsy cases of poison are unknown as per the inquest therefore proper antidote could not have been given. More cases are having congested (51.66%) & haemorrhagic (24.50%) mucosa. Chemical analysis for viscera preservation shows in 61 cases (40.39%) compound was detected and in 54 cases (35.76%) were undetected and 9 cases (5.96%) where report is still awaited. aluminium phosphide poison is most common (30 cases, 19.87%) from chemical analysis reports, very closely followed by organophosphorus compounds poison (27 cases, 17.88%). Cardiorespiratory arrest is the most common cause of death in the present study. **Conclusion:** In maximum cases poison being unknown contributing to more fatality therefore bed side analytical test and toxicological analysis set up and strict control over poison substance sale is highly required.*

INTRODUCTION

Poison is a substance (solid, liquid & gaseous), which if introduced in the living body, or brought into contact with any part thereof, will produce ill-health or death, by its constitutional or local effects or both.[1] Anything can be poison; a medicine in a toxic dose can act as poison whereas a poison in small dose can act as medicine. Poisoning is prevalent in all parts of India but trend of poisoning varies from place to place. the word poison has been evolved from the Latin word 'potion' means to drink for health and that by the time, the definition has been changed to its present form as any substance which when administered, inhaled or ingested is capable of acting deleteriously on human body.[2]

In all unnatural deaths, cause of death being not clear, poisoning remains the probable cause in minds of investigating officers as well as in the minds of the autopsy surgeon. When death occurs by some other means, as in

Address for correspondence:
[1]Tutor
Mobile: +919998227871 (**Corresponding author**)
Email: manjit8889@gmail.com
[2]3rd year resident doctor
Mobile: +918320210848
Email: vanrajrathva000@gmail.com
[3]Associate Professor
Department of Forensic Medicine and Toxicology, B.J. Medical College, Ahmedabad.

homicidal and suicidal cases, poisoning is an important associated feature, in some cases.[3] Poisons are silent weapons, which can be easily used without arousing suspicion and often without violence in expert hands.

Since the origin of the mankind, poisoning always remains associated with it, though it was mostly accidental in nature in the earlier times.[4] People started using for homicide as well suicide. The incidence of poisoning is increasing because of its low cost, easy availability without any restrictions, comparatively small fatal dose and almost sure death. In India, there is no strict control over the sale and storage of poisons.

The present study was conducted by keeping aims as to study the manner of death of poisoning cases and to study the common prevalent poison in poisoning cases.

MATERIALS AND METHODS

This retrospective study has been carried out in the Department of Forensic Medicine and Toxicology, B. J. Medical College, Civil Hospital, Asarva, Ahemdabad during the period of January 2017 to December 2017. All the alleged human poisoning cases brought for medico legal autopsy and cases that were diagnosed as poisoning after autopsy were selected.

Detailed information of the deceased concerned to the case was collected from the relatives or attendants of the deceased, from concerned police officers and hospital case papers. Detailed and complete post mortem examination including chemical analysis of viscera was done to reach cause of death.

All cases with the alleged history of poisoning, diagnosed cases of poisoning after complete post mortem examination and Confirmation from chemical analysis reports were included for the period January 2017 to December 2017.

RESULTS

The findings of the present study were depicted as below

Table 1 Distribution of cases according to alleged history of poisoning as per inquest

Poison Group	No. of cases	Percentage
Corrosive substance	31	20.53%
Aluminium phosphide	21	13.91%
Organophosphorus	10	6.62%
Kerosene	4	2.65%
$CuSO_4$	2	1.32%
Scorpion bite	2	1.32%
Snake bite	4	2.65%
Unknown insect bite	2	1.32%
Drug overdose	2	1.32%
Sedative	1	0.66%
Alcohol	3	1.99%
Ganja	1	0.66%
Unknown	75	48.67%
Total	151	100%

Present study shows that in majority of cases (75 cases, 48.67%) exact compound consumed could not be known. In known cases, acid/corrosive were most commonly used (31 cases, 20.53%) followed by aluminium phosphide (21 cases, 13.91%) and Organophosphorus compound (10 cases, 6.62%) respectively. Corrosive substance being useful in household activities making their easy availability can be the reason for involvement in maximum cases (**Table** 1).

Table 2 Distribution of poisoning cases according to condition of gastric mucosa

Gastric mucosa	No. of cases	Percentage
Congested	78	51.66%
Congested + haemorrhagic	37	24.50%
Corrosion	22	14.57%
Healthy	11	7.28%
Gastrostomy	3	1.99%
Total	151	100%

Present study shows that in 78 cases (51.66%) the mucosa of the stomach was congested. Majority of victims were hospitalised and have received treatment which may have lead degradation of the poison. In 37 cases (24.50%) the mucosa of the stomach was congested and haemorrhagic suggesting severe mucosal damage by deadly poisons with erosive effect over mucosa. Whereas in 22 cases (14.57%) were encountered where corrosive effect were present over gastric mucosa (**Table 2**).

Table 3 Distribution of cases in reference to preservation of viscera

Chemical analysis	No. of cases	Percentage
Positive	61	40.39%
Negative	54	35.76%
Awaiting	9	5.96%
Not preserved	27	17.88%
Total	151	100%

Out of total 151 cases during study period, chemical analysis was asked for in 124 cases (82.12%). Out of which, in 61cases (40.39%) compound was detected and in 54 cases (35.76%) were undetected and 9 cases (5.96%) where report is still awaited (**Table 3**).

The reason for non-detection of poison in viscera with alleged history of poisoning can be explained as it may be neutralised during treatment or denatured and it also depend upon the time interval between preservation of viscera to arrival at forensic laboratory.

Table 4 Distribution of cases according to type of poison detected by chemical analysis

Type of poison	No. of cases	Percentage
Organophosphorous	27	17.88%
Aluminium phosphide	30	19.87%
Kerosene	1	0.66%
Organo chlorine	1	0.66%
Carbamate	1	0.66%
HCL acid	1	0.66%
Total	61	100%

Present study shows that out of positive 61 cases of chemical analysis, aluminium phosphide is most common (30 cases, 19.87%) from chemical analysis reports, very closely followed by organophosphorus compounds (27 cases 17.88%) (**Table 4**).

Table 5 Distribution of cases according to post mortem reports and cause of death

Mode	Compound/Agent	No. of cases(out of 151 cases)	Percentage
Cardio-respiratory failure	Aluminium Phosphide	30	19.87%
	OP	27	17.88%
	Corrosion	25	16.56%
	Suggestive of poisoning	23	15.23%
	Organo chlorine	1	0.66%
	Cuso4	2	1.32%
	Carbamate	1	0.66%
	HCL acid	1	0.66%
	Snake bite	2	1.32%
	Scorpion sting	1	0.66%
Shock	Stomach perforation	2	1.32%
Respiratory failure	Kerosene	1	0.66%

In present study, Aluminium phosphide is most commonly encountered poison (30 cases, 19.87%) leading to maximum fatalities, very closely followed by organophosphorus compounds (27 cases, 17.88%) and corrosive substance (25 cases, 16.56%). According to history of alleged poisoning, corrosive substance were most common but after detailed post-mortem examination and chemical analysis reports, it is concluded that majority of victims died of aluminium phosphide poisoning. 23 cases (15.23%) were encountered where death was attributed to poisoning on the basis of post-mortem findings, exclusion of other pathology and history of poisoning as per inquest and case papers though chemical analysis revealed no poison in viscera (**Table 5**).

DISCUSSION

Gupta BD et al[5] and Varma NM et al[6] preserved viscera in 87.1% and 85.3% of cases respectively. To find out the type of poison chemical analysis is the necessity, even in routine cases, chemical analysis is necessary to rule out presence of poisons because poisons are silent weapons, which can be easily used without causing violence and without arousing suspicion.Being an agricultural based country, most commonly use and easily availability without restriction of these compounds can contribute to maximum involvement in poisoning case. Gupta BD et al[5] reported insecticides (53.79%) as majority from chemical analysis reports followed by aluminium phosphide (10.60%) and only 7.57% of cases where poison could not be detected and Varma NM et al[6] in his study observed, Monochrotophos (19.68%) being most common followed by aluminium phosphide (18.86%).

Vishal Garg et al[7] has also reported aluminium phosphide poisoning (36.8%) as leading cause followed by insecticides (31.6%). Kartik Prajapati et al[8] from Ahmedabad, Tandon et al[9] from Agra and N.K Agarwal et al[10] from Delhi has reported Aluminium phoshide in 20% of cases, 33.33% of cases and 38% of cases respectively.

Whereas Gupta BD et al[5] and Zine et al[11] from Nagpur has reported organophosphorus poisoning more common in their study with 62.24% of case and 21.28% of cases respectively.

CONCLUSION

Aluminium phosphide poisoning was the leading cause of death with easy availability without restrictions, cheap minimal fatal dose, no antidote and agricultural usefulness. Organophosphorus poisoning was the second most common poisoning causing fatalities. Maximum cases were from rural areas having farming back ground with usage of insecticides. There should be restriction of poisoning compound from being easy available from market and prior approval for use should be taken from authorised centres and proper records of their sale should be maintained by the retailers. Education regarding proper storage and use of household products and medicines should be given with strict supervision at home keeping away from the reach of children and young adults. Proper psychological counselling should be carried out among the vulnerable group of people. A toxicology lab should be established at the level of community health centre and all teaching medical institute for analysing common prevailing poisons like aluminium phosphide and insecticides. The problem of poisoning has been and is going to exist with human society, so more studies are required for stoppage of this developing threat.

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