

Retrospective autopsy analysis on pattern of fatal cases of poisoning

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Abstract

Background: Poisoning being invariably medico legal in nature among fatal cases, post mortem examination is done to establish the exact cause and manner of death. **Aim:** To analyze the autopsy findings of fatal cases of poisoning retrospectively. **Material and Methods:** A total of 433 poisoning victims whose autopsy was done and various internal and external findings observed during the procedure noted and necessary specimen were sent for chemical analysis. **Results:** The external findings such as stains (0.46%), vomitus (3.70%), smell (3.23%) were observed on the bodies of some of the victims. Internal findings revealed that the content of stomach (28.64%) was the most common internal finding. **Conclusion:** Chemical analysis may fail to detect certain poison in the viscera preserved for chemical analysis. Therefore, evidences of the symptom, post mortem examination is important.

Key Word: Poisoning, suicide, autopsy findings, chemical analysis

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done to establish the exact cause and manner of death. Manner of death in these cases is predominately suicidal because of the general belief that it terminates life in minimal sufferings or accidental but however homicidal cases are also reported. the incidence of poisoning is increasing day by day because of its low cost, easy availability without any check on their sales and irregularity in distribution. The present study was conducted to analyze the autopsy findings of fatal cases of poisoning retrospectively.

MATERIAL AND METHODS

This retrospective study was conducted for a period of one year. The subjects of the study were 433 poisoning victims whose autopsy was done and various internal and external findings observed during the procedure noted and necessary specimen were sent for chemical analysis. The detailed history regarding the poisonous cases that were brought dead was obtained from the inquest from the relevant investigating officer, relative of the deceased and hospital records. the observations were analysed and subjected to comparison with studies along the same line.

INTRODUCTION

Poisoning is a major epidemic of noncommunicable disease in the present century. Among the unnatural deaths, deaths due to poisoning come next only to road traffic accident deaths. In earlier times, the poisoning deaths from pesticides were mainly accidental but easy availability, low cost and unrestricted sale have led to an increase in suicidal and homicidal cases as well.¹ The World Health Organization (WHO) estimated 3 million cases of poisoning every year worldwide, of which 99% of fatal poisoning cases occur in developing nations annually.² Poisoning being invariably medico legal in nature among fatal cases, post mortem examination is

Inclusion criteria

- Victims of poisoning whose body was autopsied in the mortuary of our Government teaching hospital.

Exclusion criteria

bodies pertaining to homicidal, unknown and decomposed bodies Materials used were inquest report and other relevant police documents, optic lens for magnification, metric tape for measurement, equipment for photography, a workstation for autopsy, autopsy certificate, records of hospitalization and treatments, if any and report of the chemical analysis from regional forensic science laboratory.

Autopsy technique: The bodies of the deceased were examined post mortem using ottosaphir technique of autopsy.

RESULTS

The age of the victims spanned age groups such as 0 -10 to >70. Majority of the people who died of poisoning belonged to the age group 21 to 40(27.48%) and the least number of victims were found to belong the age group >70 yrs (1.15%). The second most number was observed in the age group 31-40. Children from the age 0-10 accounted for 1.85% of the population while 11-20 years were 10.62%. This trend was noted to decline as the age increased 41-50 were 16.40% and 51-60 was 11.3% and

61-70 were 6% of the total subjects studied. When classified according to sex, the population was found to consists mostly of males (66.74%). The females made up remaining 33.26% of study population. Physical illness (41.11%) was the commonest reason for suicidal poisoning followed by marital dispute (20.32%) and economic crisis (13.16%). Other reasons for poisoning were accidental (5.54%), conflict with parents (3.46%), family dispute (3.46%), mental illness (3.00%), academic failure (2.77%) and others (0.69%). The time upto which the individuals who ingested poison was alive was gauged. It was seen that more than half the population did not survive more than away(54.73%). Some cases survived for a full week(11.55%) was the least among all. A comparison between type of poison ingested by various individuals revealed that organo phosphorous(64.43%) compounds were the most common consumed, while the least chosen one were organo chlorine compounds(0.69%). Other poisons seen were plant poisons (3.46%), carbonates (4.62%), corrosive acids(5.08%),aluminium phosphide(5.77%),zinc phosphide(5.77%). An 8.08% of individuals consumed other poisons also. When the manner of death of the individuals were assessed, it was noted that most of the cases were suicidal (94.46%). A minor 5.56% of the deaths were due to accidental poisoning.

Table 1: Autopsy findings

Autopsy findings	No. of cases	Percentage
External findings		
Stains	02	0.46%
Vomit	16	3.70%
Smell	14	3.23%
Nil	401	92.61%
Internal findings		
Oral cavity corrosion	08	1.85%
Oral cavity perforation	12	2.77%
Stomach content	124	28.64%
Stomach smell	118	27.25%
Stomach perforation	13	3%
Small intestine content	119	27.48%
Small intestine smell	117	27.02%
Small intestine perforation	11	2.54%

The external findings such as stains(0.46%), vomitus(3.70%),smell(3.23%) were observed on the bodies of some of the victims. Internal findings revealed that the content of stomach(28.64%) was the most common internal finding. Others were smell in the stomach, contents of small intestine and smell of the same, corrosion and perforation of oral cavity, perforation of stomach and small intestine. This study revealed that most of the cases were negative (50.35%) and remaining 49.65% were of positive results in chemical analysis.

DISCUSSION

Of the total 3275 cases of post mortem, poisoning constituted 433 cases amounting to 13.22% during the study period. The period of survival was calculated and found that least incidence was more than 1 week 11.55% and most incidence was <1 day in 54.73% cases. The reason for maximum deaths in 24 hours is due to delay in detection, toxic nature of poison, individuals body response, any preexisting illness. In a study by Gopal *et al* period of survival beyond 24 hours were noted in

40.48% of total number of cases. This shows the better accessibility and apt management of medical aid.³ Physical illness (41.11%) was the commonest reason for suicidal poisoning followed by marital dispute (20.32%) and economic crisis (13.16%). The reason for physical illness to be doubted as main reason is because of their unfounded fear of police enquiry or tainting of family honor. Marital dispute, economic dispute is a rampant reason for suicides. The rising prices of the basic amenities and inability to meet them financially could be the reason for cynicism in life and also due to inability to afford the standard of treatment after exposure. Organophosphorus(64.43%) compounds were the most common consumed, while the least chosen one were organochlorine compounds(0.69%).The reason for this is due to its easy availability and accessibility owing to the extensive agricultural use. Gopal *et al* study also noted Organophosphorus compounds (57.44%) as commonest agent of poisoning.³ Similar findings were observed in the studies conducted by Murari Atul,⁴ Reddy NKS.⁵ In present study, accidental poisoning was least finding in 5.56% cases whereas in 94.46% cases it was suicidal poisoning. A death from poisoning has been ruled suicidal due to history, suicidal notes and other such circumstantial evidences. Similar findings were observed by Gopal *et al* with 95.91% deaths due to suicidal poisoning.³In a study by Awasthi *et al* 90.8% cases of poisoning were suicidal.⁶Kumar SV *et al* study also noted that self-poisoning (suicidal 52%) is the most common manner of acute poisoning.⁷ Our study revealed that the external findings such as stains(0.46%), vomitus(3.70%), smell(3.23%) were observed on the bodies of some of the victims. Internal findings revealed that the content of stomach(28.64%) was the most common internal finding. In study by Awasthi *et al*, on external examination of the deceased characteristic odor was present in 175 cases frothing at mouth and nose was present in 162 cases and cyanosis of extremities was present in 145 cases on internal autopsy examination congestion of GIT with sub mucous petechial hemorrhage and generalized visceral congestion was present in all cases.⁶ Most incidence of detection positive 49.65%, most incidence negative 50.35%. A near balanced margin of chemical analysis is usually due to the awareness for the need of emetics even among illiterates. A quick stomach wash or even administration of activated charcoal. Modi saw cases in which there were definite signs of death from poisoning,

although the chemical examiner failed to detect the poison in the viscera preserved for chemical analysis. It has, therefore been widely held by that in case where a poison has not been detected on chemical analysis, the judge, is deciding a charge of poisoning, should weigh in evidence the symptom, post mortem appearances and the moral evidence.⁸ Certain plant poisons may not be detected in the viscera, and they do not have any reliable tests, while organic poisons, especially the alkaloids and glycosides, may, by oxidation during life or purifications after death, and split up into other substances, which have no characteristic reactions sufficient for their identification.

CONCLUSION

Suicidal poisoning is the most common manner of death. Individuals in rural India resort to this desperate measure when unable to cope with financial and personal crisis. Chemical analysis may fail to detect certain poison in the viscera preserved for chemical analysis. Therefore, in such cases the judge, is deciding a charge of poisoning, should weigh in evidence the symptom, post mortem appearances and the moral evidence.

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