

Fatal Poisoning Cases in a Teaching Hospital of West Bengal: a Descriptive Cross-Sectional Clinico-epidemiological Study

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Abstract

Background: Poisoning is a global health issue and one of the leading causes of morbidity and mortality in India. Pattern of poisoning depends on factors, such as availability of poisons, socioeconomic status of the population, religious and cultural influences, thus creating varied epidemiological trends across time and regions. The present study is planned to address the epidemiological profiles of fatal poisoning cases, with reference to the gastric findings during autopsy.

Methods: This is a descriptive, observational, cross-sectional study analysing 184 fatal poisoning cases, who attended to R.G. Kar Medical College Police Mortuary during the period of 2014-2015.

Conclusion : People of age group 20-29 years were mostly affected, with a male preponderance and an incidence of 8.03%. People from the rural regions constituted more than 80% of the study sample, with suicide as the commonest manner of death. Organophosphorus compounds and acids were the mainly detected, with mucosal congestion and submucosal hemorrhage of stomach as the most reported findings. The authors feel that a prospective study is an option, which could accurately identify the cases and deaths, which could formulate stringent measures so as to decrease the morbidity and mortality due to poisoning.

Keywords : Demography, Gastric findings, Intentional poisoning

Introduction

Poisoning is a global health issue and one of the leading causes of mortality and morbidity in India.¹ According to World Health Organization (WHO), approximately 0.03 million people die annually due to various types of poisoning.² In India, it has been estimated that about 5 to 6 persons per lakh of population die due to poisoning every year.³

Wide availability, easy access and extensive use in medical, industrial, household and agricultural applications increase the risk, exposure and incidence of poisoning.⁴ Pattern of poisoning in a region depends on a variety of factors, such as availability of poisons, socioeconomic status of the population, religious and cultural influences,³ thus creating varied epidemiological trends across time and regions. Similarly, the mortality and morbidity in any case of acute poisoning depends upon a number of factors, such as the nature of poison, dose consumed, availability of medical facilities, treatment by qualified persons and the time interval between intake of poison and provision of medical help.

Though literature on poisoning in India is widely available, there is a significant lack of data from the

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eastern parts of the country. Moreover, most of the studies, so conducted, aimed at the clinical presentation and management protocols of the poisoning cases, based on in-hospital records, or are retrospective studies. The present study is hence planned to address the epidemiological profiles of fatal poisoning cases in West Bengal, with reference to the gastric findings during autopsy. In due course, it may estimate the nature and severity of poisoning, with demographic profiles of the victims, thus providing the stakeholders some recommendations in order to take appropriate preventive measures.

Aims and Objectives

1. To study the prevalence of deaths due to poisoning from 2014 to 2015
2. To study the socio-demographic profiles of the victims of fatal poisoning
3. To analyse the type of poisons
4. To study the gastric findings in fatal poisoning cases

Materials and methods

- a. Place of study: R.G. Kar Medical College Police Mortuary, Kolkata, West Bengal, India.
- b. Period of study: 1st April, 2014 to 31st March, 2015
- c. Study population: All the victims of fatal poisoning, attended to R.G. Kar Medical College Police Mortuary for autopsy examination between 2014 to 2015.

Inclusion criteria: All the victims of fatal poisoning between 2014 to 2015, who attended for autopsy examination at R.G. Kar Medical College Police Mortuary.

Exclusion criteria:

- i. Victims of fatal animal, snake and insect bites
- ii. Cases with incomplete or inadequate history

iii. Grossly decomposed bodies

d. Study design: Descriptive observational cross-sectional study

e. Statistical analysis: Details regarding the cases were obtained from the inquest report, interviewing the eyewitnesses and the family members of the deceased. All the data were manually checked and edited for completeness in a pre-determined format and were then coded for computer entry. Collected data was recorded in Microsoft Excel worksheet and SPSS IBM 19.

Results

1. Prevalence of Fatal Poisoning cases

The number of victims due to poisoning was 184 (8.03%) among 2290 cases sent for autopsy.

2. Distribution according to age and gender

Majority of the victims of fatal poisoning belong to the age group of 20-29 years, with a male predominance in almost all the age groups (except victims below 10 years and between 40-49 years). [Table 1].

3. Distribution according to religion and residence

In our study, 141 out of total 184 victims (76.63%), were Hindus and the rest 43 victims (23.37%) belonged to the Muslim community. 148 of the victims (80.4%) were from the rural regions and the rest 36 of the victims (19.6%) belonged to urban areas.

4. Distribution according to the type of poison

Majority of the fatal poisoning cases were due to Organophosphorus poisoning (22.8%), followed by 21.1% victims of acid ingestion [Figure 1].

5. Distribution according to manners of poisoning (as per Police inquests)

Deaths due to suicide (91.3%) were maximum, followed by accidental (7%) and homicidal poisonings (1.7%).

6. Distribution according to smell of gastric contents

Gastric contents mostly exhibited pungent odours (47.4%), followed by 23.9% of the victims with no untoward smell [Table 2].

7. Distribution according to appearance of gastric mucosa

Congested mucosa (46.2%) was mostly found, followed by submucosal hemorrhage (30.5%) and 15.8% of victims with charred mucosa and perforation [Figure 2].

Table 1 Distribution of fatal poisoning cases according to age and gender

Age (in years)	Female		Male	
	Number	Percentage	Number	Percentage
<10	1	100	0	0
10-19	13	44.83	16	55.17
20-29	20	42.55	27	57.45
30-39	9	29.03	22	70.97
40-49	15	51.72	14	48.28
50-60	5	19.23	21	80.77
>60	9	42.86	12	57.14

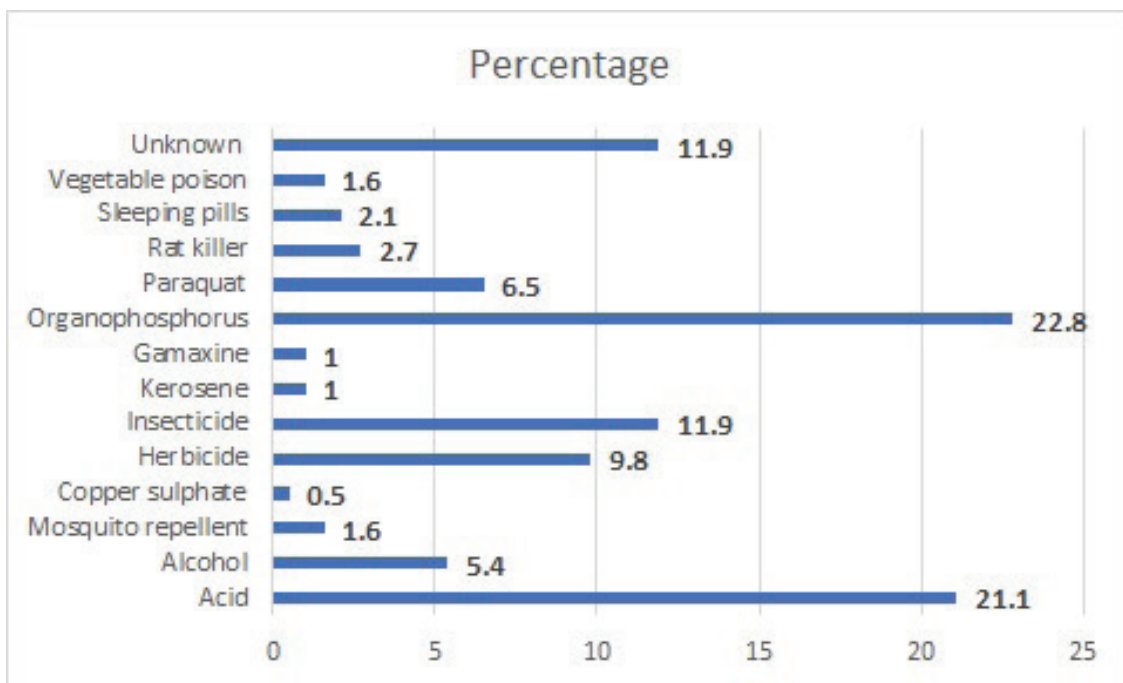
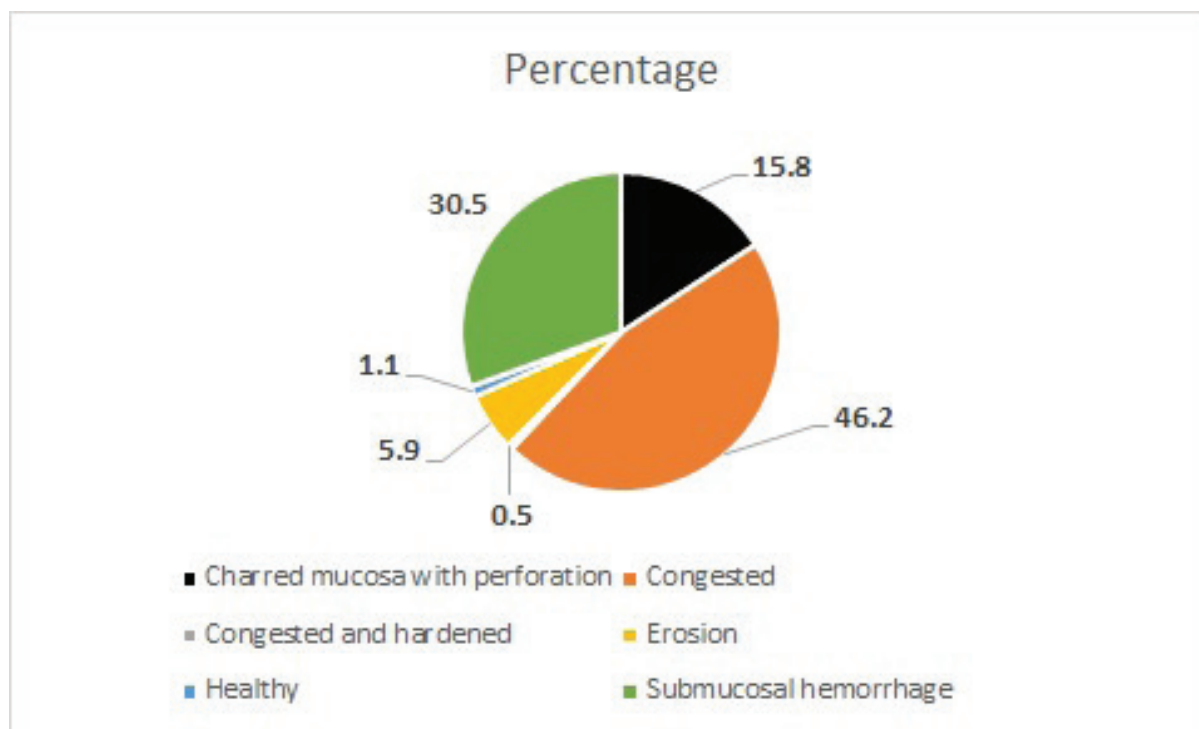


Fig 1 Distribution according to type of poison

Table 2 Distribution according to smell of Gastric contents

Smell of Gastric content	Number	Percentage
Alcoholic	6	3.2
Faint uncharacteristic odour	23	12,5
Kerosene like	21	11.4
Noodour	44	23.9
Phenyl like	3	1.6
Pungent	87	47.4

**Fig 2 Distribution according to appearance of gastric mucosa**

Discussion

The present study examines the prevalence, socio-demographic profiles and nature of fatal poisoning among cases who was brought to the Institutional Police Mortuary for autopsy examination. The higher prevalence among males by 1.5 times that of females is also noted in other parts around India.⁵ Even in a study from Karnataka, the males dominated the study with male:female ratio

of 3:1.⁶ In continuation to the data from Southern parts of the country, the majority of the fatal poisoning cases in our study belonged to the age group of 2nd to 3rd decade.^{5,6} The possible reasons for increased poisoning in this age group may be because of problems in family, studies, marriage, life settlement and employment which may themselves act as stressors to suicidal ideation and attempts.⁷ Owing to the geographical location, though religion was not considered for analysis, but the people

from the rural areas contributes to a significantly higher percentage (80.4%) of the study sample. Similarly, a study from North India shares that 60% of their victims were from rural background, with lesser resources available to them than their urban counterparts.⁸ This compounded by the usually large family size, high illiteracy, ignorance and superstitions, complete dependence on the fate of their crop- both in the field and in the market may be responsible for the trend observed in our study.

Various national and international studies have projected the rise of prevalence of suicidal poisoning cases.^{7,9} During the study period, 184 fatal poisoning cases were collected, with more than 90% of the deaths attributable to suicides. This endorses the view that the demands put forth by the materialistic modern society is the main factor for deaths due to poisoning.⁸ Studies across the country have revealed a rapidly increasing trend of Organophosphorus poisoning.^{10,11} Similarly, Organophosphorus compound was the single most culprit agent in about 23% of cases in our study, followed by acids in 21%. India is a country, where agriculture is the prime profession for majority of people in rural areas and pest control is one of the most common problems faced by the farmers in agriculture.⁷ In order to eradicate the weeds and pests, farmers procure and keep pesticides at their houses. Because of easy availability of the pesticides, people tend to use them for intentional poisoning.

Though odour of the gastric contents being a subjective data was not considered for analysis, stomach was affected in all the poisoning cases. This may be due to the fact that stomach being a reservoir, the contact period of poison with stomach is more.¹² In the present study, congestion was noted in more than 45% of cases which is in accordance to other studies, conducted elsewhere around the country. However, there are numerous factors that contribute to the stomach mucosal finding in poisoning cases. These are the dosage, biological factors, route of administration, treatment interventions and the post-mortem interval.¹³ With all these factors

affecting, it is difficult to predict the gross mucosal findings attributable to specific poisons. Generally, the findings are seen in combination, and are not consistent with a type of poison. However, if the poison suspected is mentioned in the requisition to the Forensic Science Laboratory, it shall help in early analysis and also avoids blind testing and wastage of chemicals.

Conclusion

The present study is an observational, descriptive, cross-sectional study. Other than reporting an annual prevalence of 8.03% of fatal poisoning cases, it also reflects that the individuals between 2nd to 3rd decade as the most vulnerable, with a male preponderance in almost all the age groups. People from the rural regions were mostly the victims of fatal poisoning, with suicidal poisoning being shared as the most common manner of death. Organophosphorus compounds and acids were the mainly involved in almost 50% of the cases, with mucosal congestion and submucosal hemorrhage of stomach as the most reported findings. However, the authors feel that a prospective study is the need of the hour, which could accurately identify the cases and deaths, which could formulate stringent measures so as to decrease the morbidity and mortality due to poisoning.

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Ethical Clearance: Taken

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