



Original Research Article

Pattern of Deaths Attributable to Poisoning in North Karnataka

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ABSTRACT

Background: Poisoning deaths are a significant part of the cases where post-mortem is performed and unraveling the various characteristics of the circumstance of poisoning is important to identify and ameliorate the causes.

Material and Methods: This was an observational, retrospective, descriptive study that included all cases of deaths due to poisoning during the period of January 2008 to December 2009, for which a postmortem was performed in the mortuary premises of the department.

Results: There were 138 cases of deaths due to poisoning during the relevant period, with male predominance. Organophosphorus compounds formed the major cause of death in cases of poisoning. Most cases of poisoning were suicidal in nature and the major age group affected was 21-40 years.

Conclusion: The pattern revealed from this study showed a male predominance. Organophosphorus compounds were the major culprit in many cases and in most cases the poisoning was intentional. Poisoning was more prevalent in the 21-40 years age group.

Keywords: Poisoning; Post-mortem; Suicide; Homicide; Accidental.

INTRODUCTION

The definition of poisoning can be difficult and it cannot be defined simply as an unwanted effect of ingestion of a chemical, because death under many circumstances barring the accidental ones is often the desired effect of ingesting the chemical in question. ^[1] Poisoning death is a broad category encompassing deaths caused by many different substances. There are

several practical approaches to surveillance of poisoning deaths, including the use of medical examiner data, vital statistics underlying-cause data, and vital statistics multiple-cause data. ^[2]

It is agreed generally that in areas where adequate toxicological facilities are provided, approximately ten per cent of all deaths investigated by medical examiners or

coroners are likely to be the result of poisoning. [3]

The circumstances of human poisoning may be suicidal, homicidal, stupefying or accidental in nature. The common suicidal poisons are potassium cyanide, opium, barbiturates, organophosphorus compounds, oleander, etc. The poisons preferred for homicidal purposes are arsenic, antimony, aconite, thallium, strychnine etc. Accidental poisoning may occur due to carelessness in storage of poisonous chemicals, greater usage of certain chemicals for industrial and household purposes, etc. [4]

The national statistics for suicidal poisoning (as a percentage of total suicides) as given by the National Crime Records Bureau (NCRB) was about 32%, 29.1% and 27.9% for the years 2011, 2012 and 2013 respectively. That from the state of Karnataka (as a percentage of national share) was about 28.7%. As far as sex and age distribution is concerned, the number of suicides by poisoning are, in the age group < 14 years (M - 210, F- 286), 15 – 29 years (M - 7032, F- 5458), 30 – 44 years (M - 8793, F- 3940), 45 – 59 years (M - 6428, F- 1941) and > 60 years (M - 2596, F- 941). [5] The terminally ill, mentally incapacitated, drug addicts, the elderly and the very young are at the highest risk for poisoning. [6]

Knowing the common poisons that are consumed helps in cutting down the number of tests that needs to be done to identify the culprit poison, thereby allowing the attention to be concentrated on certain groups of poison. [3] Hence this study was envisioned to observe the patterns of poisoning deaths (i.e. whether suicidal, homicidal or accidental), the common types of poisons used and the various attendant circumstances pertaining to the poisoning.

MATERIALS AND METHODS

This is an observational, retrospective, descriptive study that included all cases attributable to poisoning during the period of January 2008 to December 2009, for which a post-mortem was performed in the mortuary premises of the department of Forensic Medicine, Karnataka institute of medical sciences, Hubballi, Karnataka.

The post-mortem records available with the department were scrutinised for selection of cases for this study. All cases of death deemed to be due to poisoning were included in the study. For cases so identified, the hospital records, full post-mortem reports, and other relevant ancillary material like toxicology reports were analysed. History regarding the cases was obtained from the police records as well the treating doctor in cases where the patient was admitted before death ensued.

RESULTS

During the relevant study period there were a total of 138 deaths due to poisoning, of which there were 99 male cases (constituting 71.4 % of total cases), while the number of poisoning deaths in females was 39 cases (28.26 %). (Table 1).

	Number of cases	Percentage (%)
Males	99	71.4%
Females	39	28.26%
Total	138	100%

Duration of stay	Number of cases	Percentage (%)
Brought dead	17	12.31%
< 24 hours	82	59.41%
2 days	14	10.14%
3 days	11	7.97%
4 days	9	6.52%
> 4 days	5	3.62%
Total	138	100%

The duration of hospital stay preceding the death in poisoning cases were lesser than 24 hours in 82 cases (59.41 %),

while 17 cases (12.31 %) were brought dead. (Table 2)

Regarding the type of poison consumed or used, overall a large number of cases were due to organophosphorus compounds i.e. 90 cases (65.21%). In males as well as females a large percentage of cases were due to organophosphorus

compound consumption 65 cases (65.65%) and 25 cases (64.1%) respectively. The next most common type of poison used in males is alcohol i.e. 9 cases (9.09%) and in females it was organochlorine and carbamates i.e. 4 cases (10.25%) each. (Table 3)

Type of poison	Males		Females		Total	
	Cases	%	Cases	%	Cases	%
Organophosphorous compounds	65	65.65%	25	64.1%	90	65.21%
Alcohol	9	9.09%	1	2.56%	10	7.25%
Organochlorine compounds	5	5.05%	4	10.25%	9	6.52%
Carbamate	3	3.03%	4	10.25%	7	5.07%
Organophosphorous + Alcohol	5	5.05%	0	0	5	3.62%
Sedatives	1	1.01%	1	2.56%	2	1.45%
Phosphides	1	1.01%	1	2.56%	2	1.45%
Phosphides + Alcohol	1	1.01%	0	0	1	0.72%
Phenol	0	0	1	2.56%	1	0.72%
Negative	9	9.09%	2	5.13%	11	7.97%
Total	99	100%	39	100%	138	100%

Age group	Males		Females		Total	
	Cases	%	Cases	%	Cases	%
< 10 yes	1	1.01%	0	0	1	0.72%
11 – 20 years	11	11.11%	15	38.46%	26	18.84%
21 – 30 years	31	31.31%	12	30.77%	43	31.16%
31 – 40 years	29	29.29%	6	15.38%	35	25.36%
41 – 50 years	17	17.17%	4	10.25%	21	15.22%
51 – 60 years	6	6.06%	0	0	6	4.35%
> 60 years	4	4.04%	2	5.13%	6	4.35%
Total	99	100%	39	100%	138	100%

	Males		Females		Total	
	Cases	%	Cases	%	Cases	%
Accidental	7	7.07%	1	2.56%	8	5.79%
Suicidal	92	92.92%	38	97.43%	130	94.19%
Homicidal	0	0	0	0	0	0
Total	99	100%	39	100%	138	100%

Overall the majority of poisoning deaths were in the age group of 21-40 years. In males a similar picture is presented, but in females the major age group affected was 11-30 years. (Table 4)

As regards to the nature of poisoning, an overwhelming number of cases were suicidal in nature. In males a small percentage of cases were accidental in

nature, which was negligible in females. (Table 5)

DISCUSSION

Out of the total 138 deaths due to poisoning, 99 cases were male (71.4 %), while the number of poisoning deaths in females was 39 cases (28.26 %), with a male to female ratio of 2.5:1. This scenario is similar to the study done by Ramesha KN et

al in a tertiary care centre in Karnataka, wherein they observed that the incidence of poisoning was more common among males (75.4%) compared to females (24.3) with a ratio of 3:1. [7] The male to female ratio of poisoning cases was lesser in another study done by Abubakar S et al, where there were 59.4% males and 40.6% females and the male female ratio was 1.46:1. [8] Whereas a much higher M:F ratio of 6.1: 1. has been reported in a study by Guntheti BK and Singh UP. [9] A study by Anthony L and Kulkarni C also found that the numbers of male patients with poisoning were significantly greater than the number of women with poisoning. [10]

In the present study the type of poison consumed or used, in a large number of cases were due to organophosphorus compounds i.e. 90 cases (65.21%). This overall picture is also representative of both males and females. This is the overall scenario observed in all poisoning cases pertaining to the Indian subcontinent. [7-10]

Alcohol consumption was the second most common causative factor for death due to poisoning in males in the present study. Death from alcohol poisoning is not uncommon and can occur at blood levels in excess of about 300mg/100ml. [11] The most life threatening effects of severe ethanol intoxication are respiratory and cardiovascular. Respiratory depression may lead to pulmonary failure in severe intoxication and asphyxiation from aspiration of vomitus can also occur. Acute overdose may result in life threatening cardiovascular effects like atrial fibrillation and atrioventricular block. [12] In a few cases alcohol was consumed along with other poisons like organophosphorus and phosphides, the purpose for such behaviour may be to mask the smell/taste of these poisons or they were suffering from chronic alcoholism. In 11 cases (7.97%) the toxicology reports turned out to be negative,

but type of poisoning in these cases were based on the case histories obtained from treating doctors. In a majority of these cases the subject was admitted for some period in the hospital before death ensued.

Overall the majority of poisoning deaths in this study were in the age group of 21-40 years. In males a similar picture is presented, but in females the major age group affected was 11-30 years. There is increased incidence in this age group, as this age represents a tumultuous phase both physically as well as mentally and hence more prone to stress during life. [8]

As regards to the nature of poisoning, an overwhelming number of cases were suicidal in nature. In males a small percentage of cases were accidental in nature, which was negligible in females. This pattern is mimicked in the reportage of several such studies. [7-9] A higher level of accidental poisoning can be expected if the percentage of paediatric age subjects is present, which was not the case in the present study.

CONCLUSION

The pattern revealed from this study showed a male predominance. Organophosphorus compounds were the major culprit in many cases and in most cases the poisoning was intentional. Poisoning was more prevalent in the 21-40 years age group.

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