



TYPES AND FREQUENCIES OF POISONING RELATED DEATHS IN RANCHI: AN AUTOPSY BASED STUDY

Medicine

Dr. Sawan Mundri Assistant Professor, Department of FMT, RIMS, Ranchi-834099

Dr. Ajay Bhengra* Senior Resident, Department of FMT, AIIMS, Raipur (C.G.) *Corresponding Author

Dr. Jyotish Guria Senior Resident, Department of FMT, AIIMS, Raipur (C.G.)

ABSTRACT

Introduction: Poisoning is one of the most common causes of death worldwide. Agriculture shares a major economy in India. Population related to the agriculture has easy access to various insecticides and other agrochemical products.

Aims and Objectives:

- To assess types and frequency of poisoning in the region of Ranchi (Jharkhand).
- To correlate the cases of poisoning with various factors in the society.
- To provide a data to authorities to reduce poisoning related mortality and morbidity.

Materials and Methods: The study was carried in the Department of Forensic Medicine and Toxicology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand. All the alleged cases of poisoning were studied for a period of one year (July 2008 to June 2009).

Conclusion: out of 141 cases, 97 were males and 42.7% were from 20-29 years of age. The study shows that majority of the cases (53.2%) were unmarried and 39% were from rural areas. 46.8% of cases were from average socio-economic class. Majority of cases survived less than 24 hours and maximum of them were of organophosphorous poisoning.

KEYWORDS

poisoning, insecticides, organophosphorous

INTRODUCTION

Deaths by poisoning are a matter of concern throughout the world as it is one of the leading causes amongst humans. The father of toxicology, Paracelsus, once wrote, "All things are poison and nothing is without poison. It is the dose only that makes a thing not a poison"¹. The word poison is evolved from the Latin word "potion" that is to drink². In medical context, "poison is a substance (solid, liquid or 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"³.

In advanced countries, it has been observed that poisoning deaths are mainly due to medicinal drug abuse (analgesics, tranquilizers, antidepressants etc.), cleaning agents, detergents and cosmetics products^{4,5}. In India, as agriculture is the main occupation, insecticides and other agrochemical fertilizers are used to a greater extent and the poisoning with such products are common⁶. Poisoning accounted for 7.5% of all causes of unnatural deaths in the year 2007, as per data obtained from National Crime Bureau of India⁷.

Studies of this nature will be useful in planning for providing healthcare facilities to reduce the poisoning associated mortality and morbidity. The study was designed to assess the pattern of poisoning in various aspects of the society in this particular region assisting the healthcare professional and policymakers.

MATERIALS AND METHODS:

The present study was conducted in the Department of Forensic Medicine and Toxicology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand. In the present study, all the cases having alleged history of death due to any kind of poisoning brought for postmortem examination in the mortuary during the period of July 2008 to June 2009 were studied. During this period 141 cases were that of poisoning.

All the data was collected in detail, statistically and critically analyzed, tabulated and compared with other various studies. Trends in distribution of poisoning case were observed in relation to age, gender, type of poison, survival period and seasonal distribution along with the marital and social status.

OBSERVATION:

Table 1. Distribution of the study population according to sex

Sex	Cases	Percentage
Male	97	68.8
Female	44	31.2
Total	141	100

Out of the total 141 cases, 97 cases were of males (68.8%) while

44(31.2%) that of females.

Table 2. Distribution of study population according to age

Age	Cases	Percentage
0-10	03	2.1
11-20	31	22
21-30	56	39.8
31-40	24	17
41-50	11	7.8
51-60	09	6.4
61-70	05	3.5
>70	02	1.4
Total	141	100

According to age-wise distribution, 56 cases (39.8%) belong to 21-30 age group, followed by 31 cases (22%) belongs to 11-20 age groups

Table 3. Distribution of the study population according to the marital status.

Marital status	Cases	Percentage
Married	56	39.8
Unmarried	75	53.2
Unknown	10	07
Total	141	100

75 cases (53.2%) were unmarried while only 56 cases (39.8%) were married.

Table 4. Distribution of the study material according to the locality

Locality	Cases	Percentage
Rural	55	39
Urban	40	28.4
Semi-urban	39	27.6
Unknown	07	05
Total	141	100

Cases referring to the rural area formed majority of the study i.e. 55 cases (39%). It is followed by 40 cases (28.4%) of urban area and 39 cases (27.6%) of semi-urban area.

Table 5. Distribution of the study material according to the social status

Social status	Cases	Percentage
Low	61	43.3
Average	66	46.8
Good	03	2.1
Unknown	11	7.8
Total	141	100

According to the social status, 66 cases (46.8%) were of average social-economic status while 61 cases (43.3%) belonged to low socio-economic status.

Table 6. Distribution of the study material according to the month

Month	Cases	Percentage
January	21	14.9
February	10	07
March	12	8.5
April	15	10.7
May	11	7.8
June	08	5.7
July	15	10.7
August	11	7.8
September	07	05
October	10	07
November	09	6.4
December	12	8.5
Total	141	100

Maximum cases reported were in the month of January with 21 cases (14.9%) followed by the month of April and July with 15 cases in each month.

Table 7. Distribution of the study material according to survival period

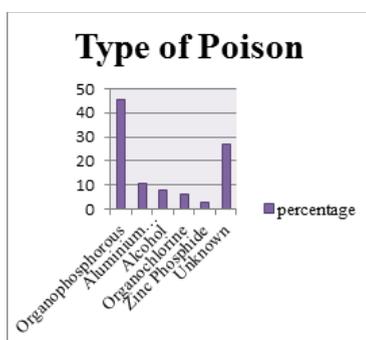
Period of survival	Cases	Percentage
<24 hrs	67	47.5
1-2 days	15	10.7
2-3 days	07	05
Unknown	52	36.8
Total	141	100

Only 67 cases (47.5%) survived less than 24 hours while only 15 cases (10.7%) survived for 1-2 days.

Table 8. Distribution of the study material according to alleged history of poison consumed

Type of poison	Cases	Percentage
Organophosphorus(OP)	64	45.3
Aluminium Phosphide(AIP)	15	10.7
Alcohol	11	7.8
Organochlorine(OCI)	09	6.4
Zinc Phosphide(ZnP)	04	2.8
Unknown	38	27
Total	141	100

Graph 1



Majority of the cases (64 cases) were of the Organophosphorous followed by Aluminium Phosphide (15 cases)

DISCUSSION:

In the present study, the males: females ratio was 2.20:1^(table1). Male dominance of poisoning in this study is similar to the other studies. Gupta, et al reported that 71.8% cases were males⁸. Shoaib, et al found a male preponderance with 59.6% cases⁹. This finding in our study is not consistent with the findings of Pokhrel, et al¹⁰, Marahatta, et al¹¹ and Banerjee, et al¹², who have reported that females outnumbered males in the incidence of poisoning. The increased incidence of poisoning in males may be attributed to more exposure to stress, strain and occupational hazards in general as compared to females.

Our study correlates with that of the Gupta, et al who concluded that

maximum cases (42.7%) were from 20-29 years age group^(table2). Pokhrel, et al¹⁰ and Ramesha, et al¹³ also reported that majority of the cases belong to this age group. It may be due to the fact that this is the most active phase of life and people are involved physically, mentally, and socially more with each other. Insecurity issues with respect to career and income, failure in love or marriage and inability to bear the life stresses can lead to irrational act resulting in fatal outcome.

In our study 53.2% of the cases were unmarried while only 39.8% were married^(table3). This finding is contrary to the other conventional studies¹⁴⁻¹⁸. Marriage and its related issues play a lesser role in poisoning incidents in this region. Career issues, failure in love and even minor quarrel with parents play the major role for such incidents.

The present study showed that maximum cases were from the rural areas (39%)^(table4). This may be due to illiteracy and their dependency on the fate of their crops.

The majority of the cases in the study belong to the average socio-economic class (46.8%)^(table5). The majority of the population of the region belongs to this group.

The findings of the study have no major seasonal variation^(table6). The incidents were reported throughout the year.

The majority of the cases (47.5%) in the study survived less than 24 hours^(table7). This finding is similar to Jain, et al¹⁹. This may be due to majority of incidents occurring in the rural areas and inability to reach the hospital on time. There is also role of poor health care facilities in the peripheral regions.

The organophosphorous compounds were used in 45.3% of the cases^(table8, graph1). Along with it other insecticides and rodenticides were also utilized for the purpose. Since agriculture is the main occupation in this region, people have easy accessible to these chemicals.

CONCLUSIONS:

The study highlighted various factors related to the poisoning cases. Males are more involved than the females. People of young age are major share of the study and that too from the rural areas. People from average social status were more involved. The study showed that there was no major seasonal variation. Around half of the cases survived less than 24 hours and most of the person used organophosphorous compounds.

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