National Journal of Physiology, Pharmacy and Pharmacology

RESEARCH ARTICLE

Incidence and pattern of poisoning cases admitted in a tertiary care center

Geetha Rani A[1], Bhuvaneshwaran B[2], Inba Idhaya[3]

[1]Department of Pharmacology, Tirunelveli Medical College, Tirunelveli, Tamil Nadu, India, [2]Department of Psychiatry, Tirunelveli Medical College, Tirunelveli, Tamil Nadu, India, [3]MBBS Student, Thoothukudi Medical College, Thoothukudi, Tamil Nadu, India

Correspondence to: Bhuvaneshwaran B, E-mail: bhuvantvmc@gmail.com

Received: February 01, 2020; **Accepted:** February 18, 2020

ABSTRACT

Background: Poisoning, either accidental or intentional, is a major consideration in relation to health-care systems. It is one of the important causes of mortality and morbidity. It is important to know the nature, pattern, and severity of poisoning occurring in concerned areas so as to reduce the mortality due to that. **Aims and Objectives:** The objectives of this study were as follows: (1) To estimate the incidence and pattern of poisoning in Government Thoothukudi Medical College Hospital and (2) to estimate the survival outcomes and mortality due to poisoning. **Materials and Methods:** This study was a retrospective observational study that was done by collecting the data from the Medical record department (MRD) regarding the patients diagnosed and admitted with poisoning in Government Thoothukudi Medical College Hospital during June 2018. The data were analyzed to estimate the incidence and outcomes of these poisoning cases. **Results:** Among 103 cases admitted with poisoning, 61.17% were male and 38.33% were female. About 75% had a suicidal mode of poisoning and the remaining 25% were accidental. Hair dye (22%) was the most common type of poisoning observed, followed by organophosphorus poisoning (13%) and snakebite (13%). The mortality rate was around 3.9% and majority were due to organophosphorus poisoning. **Conclusion:** Hair dye was the most common poisoning occurring in this area though no deaths were reported due to it in this study. However, mortality was observed more with organophosphorus poisoning in the present study.

KEY WORDS: Poisoning; Hair Dye; Suicide

INTRODUCTION

Poison is a substance capable of producing damage or dysfunction in the body by its chemical activity. Poisoning may be acute, that is, following single ingestion or more chronic following repeated exposure such as occurring in an industrial setting. Poisoning occurs when any substance interferes with normal bodily functions after it is swallowed, inhaled, injected, or absorbed.

Access this article online	
Website: www.njppp.com	Quick Response code
DOI: 10.5455/njppp.2020.10.02033202018022020	

Poison information services often categorize poisons based on their source as pharmaceutical, household product, pesticide, chemical, cosmetic, snake, or other bites. Pesticides, especially organophosphorus compounds, are the common agents which contribute to majority of the cases.[1,2] Every year >3 million cases of poisoning due to organophosphorus compounds have been reported according to the World Health Organization, of which >250,000 deaths were due to intentional self-poisoning.[3,4] Snakebite is another medical emergency faced by the rural population.[5]

The mode of poisoning can be suicidal, accidental, or homicidal. Throughout the world, there is a 60% increase in the rates of suicide in the past 40 years.[6] Self-poisoning was the most common suicide method used by the young population. Worldwide intentional poisoning is one of the important causes of mortality and morbidity, though the

nature and pattern of poisoning differ between regions. Factors contributing to mortality and morbidity include the toxic potential of the poison, the speed with which the person seeks clinical attention after exposure to the poison, and the availability of effective medical treatment.[7]

It is important to understand the nature, pattern, incidence, and survival outcomes of poisoning in a particular area so that it will be useful for properly utilizing health-care resources for the prevention and management of poisoning. Hence, this study was planned to estimate the incidence, pattern, and survival outcomes of poisoning cases admitted in Government Thoothukudi Medical College Hospital.

Aims and Objectives

The objectives of this study were as follows:

- To estimate the incidence and pattern of poisoning in Government Thoothukudi Medical College Hospital.
- To estimate the survival outcomes and mortality due to poisoning.

MATERIALS AND METHODS

Study Design

This was a retrospective observational study.

Study Procedure

The study commenced after getting approval from the Institutional Ethical Committee. Data of patients who were admitted with the diagnosis of poisoning during June 2018 in the intensive medical care unit in Government Thoothukudi Medical College Hospital were collected from MRD.

A detailed report regarding the demographic details, type of poison, mode of poison, duration of stay in the hospital, and survival outcomes was collected from the case sheets in the medical record department and transferred to data entry format. The collected data were analyzed for their appropriateness, and based on that data interpretation was made. The results were statistically analyzed.

RESULTS

The data from the medical record room revealed about 103 cases were admitted with the diagnosis of poisoning during that period.

The incidence of poisoning was more among males (61.17%) as compared to female, and it was high between the age group of 21 and 30 years (34.95%) and least in the older age group between 61 and 70 years [Table 1].

The mode of poison was suicidal (75%) in the majority of cases in this study [Figure 1]. Hair dye (22%) was the most common type of poison used by patients, followed by organophosphorus (13%) and snakebite (13%) [Figure 2]. The majority of deaths were reported due to organophosphorus poisoning.

A comparison of mean age between hair dye poisoning and other poison cases was done by an independent sample test, and gender comparison between hair dye poisoning and other poison cases was done by the Chi-square test [Table 2].

A comparison of survival outcomes between organophosphorus and other poisons was done using Fisher's exact test [Figure 3].

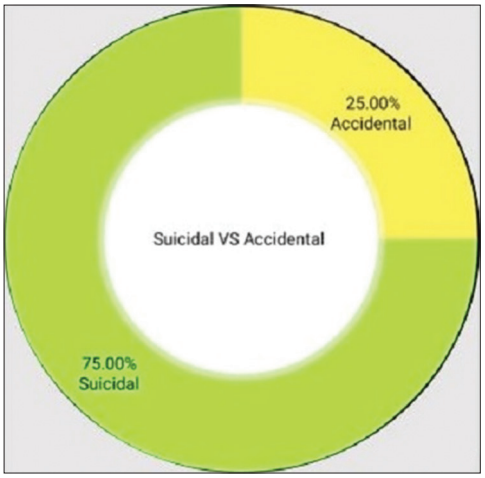

Figure 1: Mode of poisoning

Table 1: Demographic profile of patients

Demographic profile	Percentage
Age (in years)	
11–20	20.39
21–30	34.95
31–40	16.50
41–50	12.62
51–60	9.70
61–70	5.82
Sex	
Male	61.17
Female	38.83

Table 2: Hair dye versus other poisons demographic comparisons

Criteria	Hair dye (%)	Others (%)	*P*-value
Female	10 (25)	30 (75)	0.634
Male	13 (20.6)	50 (79.4)	
Mean age (no)	29.74	38.84	0.179

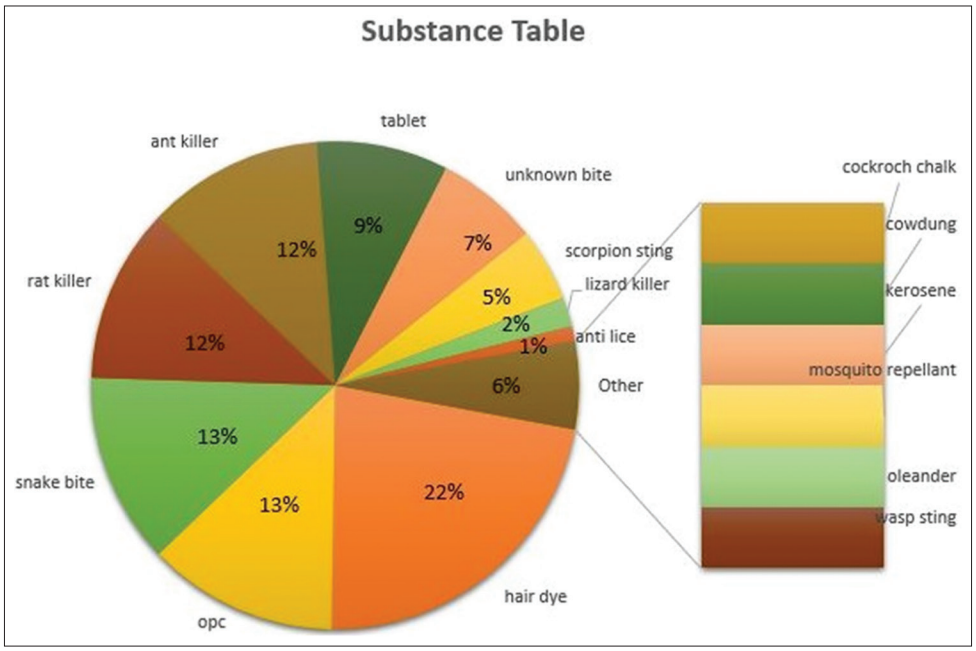

Figure 2: Type of poison

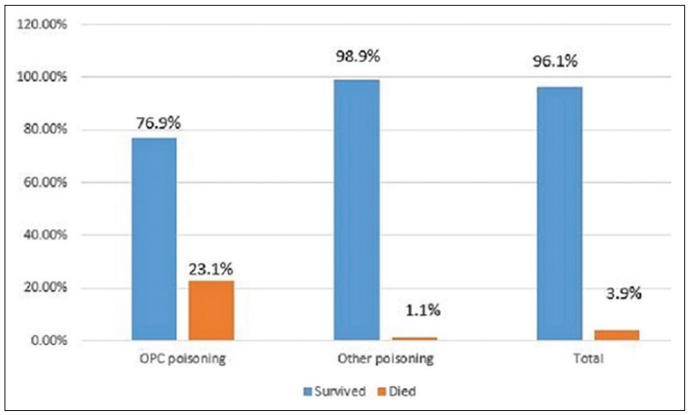

Figure 3: Survival outcomes: Organophosphorus poisoning versus other poisoning

DISCUSSION

This study, which had been approved by the Institutional Ethical Committee, was carried out as a retrospective observational study in a tertiary care center of South Tamil Nadu. Details of all the poisoning cases admitted during June 2018 were obtained from MRD. The study evaluated the incidence and pattern of poisoning cases during that specified period.

The present study included all poisoning cases such as chemical poisons, snakebite, scorpion sting, wasp sting, unknown bite, and tablet poisoning. Around 15 substances were found responsible for the poisoning in this study. The results of our study revealed that about 103 cases were admitted due to acute poisoning during June 2018. Of these, the mortality rate was 3.9%.

Demographic data showed a preponderance of male among 103 patients admitted with poisoning. Furthermore, the incidence of poisoning was more common (34.95%) in the age group between 21 and 30 years followed in sequence by 11–20 years age group persons (20.39%). The mode of poisoning was suicidal (75%) in the majority of the cases. The most common type of poisoning reported in the present study was hair dye usage (22%). Organophosphorus poisoning and snakebite were responsible for 13% of cases each whereas rat killer and ant killer poisoning contributed to around 12% of the cases each. With respect to mortality, 2.8% of deaths were due to organophosphorus poisoning.

There was a higher incidence of poisoning in males,[8] as seen with the study conducted by Sharma *et al*. (2002). About 34.95% of patients were in the age group between 21 and 30 years. The incidences were more in the age group between 21 and 30 years,[9,10] which are in accordance with the studies done by Kumar *et al*. (2010) and Khosya and Meena (2015).

Suicidal[11] intention played a major role in the present study. Suicidal attempts among adult males have been increasing recently due to unemployment, frustrations, inefficiency to cope with stress, and impulsive behavior. This is comparable to the study done by Rangu *et al*. (2017).

Among the various substances, hair dye (Super Vasmol) was the most common substance used by patients in the present study. It contains paraphenylenediamine (4%), resorcinol, propylene glycol, ethylenediaminetetraacetic acid, sodium, liquid paraffin, cetostearyl alcohol, sodium lauryl sulfate, herbal extracts, preservatives, and perfumes. Among these ingredients, some of them are prone to cause damage to multiple organs. Hair dye poisoning was a common substance used by the patients in the present study due to easy availability and affordability, as seen with the study by Nohynek *et al*. and Sampathkumar and Yesudas.[12,13]

Furthermore, the next common reasons for poisoning in the present study were organophosphorus pesticide and snakebite. The mortality rate was more with organophosphorus poisoning when compared to others, which was in accordance with the study by Kumar *et al*., 2010.[9]

Strength of the Study

The data of all the patients during the study were analyzed and comparison of various parameters between hair dye poisoning and other poisons was made. Furthermore, a comparison of survival outcome between organophosphorus and other poisons was made.

Limitations

We included the data of patients admitted only for 1 month. We did not evaluate their duration of stay in the hospital. We also did not analyze the duration between the time of exposure to the poison and their admission in the hospital which contributes, mainly to survival outcomes.

CONCLUSION

Finally, our results showed that hair dye was the most common poisoning occurring in this area, but no deaths were reported due to it. Since specific antidote for hair dye poisoning is not available, proper supportive measures and early intervention can reduce the manifestations due to it. Mortality was more in organophosphorus poisoning. The majority of poisoning victims were young adults from a rural area. Counseling and proper health education measures are needed to reduce the incidence of poisoning.

REFERENCES

1. Eddleston M, Phillips MR. Self poisoning with pesticides. BMJ 2004;328:42-4.
2. Kanchan T, Menezes RG. Suicidal poisoning in Southern India: Gender differences. J Forensic Leg Med 2008;15:7-14.
3. Carey JL, Dunn C, Gaspari RJ. Central respiratory failure during acute organophosphate poisoning. Respir Physiol Neurobiol 2013;189:403-10.
4. Iyer R, Iken B, Leon A. Developments in alternative treatments for organophosphate poisoning. Toxicol Lett 2015;233:200-6.
5. Banejee RN. Poisonous snakes and their venoms, symptomatology and treatment. In: Ahuja MM, editors. Progress in Clinical Medicine. India: Heinemann; 2003. p. 136-79.
6. Kordrostami R, Akhgari M, Ameri M, Ghadipasha M, Aghakhani K. Forensic toxicology analysis of self-poisoning suicidal deaths in Tehran, Iran; trends between 2011-2015. Daru 2017;25:15.
7. Eddleston M. Patterns and problems of deliberate self-poisoning in the developing world. QJM 2000;93:715-31.
8. Sharma BR, Harish D, Sharma V, Vij K. Poisoning in northern India: Changing trends, causes and prevention thereof. Med Sci Law 2002;42:251-7.
9. Kumar SV, Venkateswarlu B, Sasikala M, Kumar GV. A study on poisoning cases in a tertiary care hospital. J Nat Sci Biol Med 2010;1:35-9.
10. Khosya S, Meena SR. Current trends of poisoning: An experience at a tertiary care hospital Hadoti region, Rajasthan, India. J Clin Toxicol 2015;6:298.
11. Rangu S, Sundaragiri S, Mittal C, Parakkattil J. Study of poisoning trends in South India: A perspective in relation to Indian statistics. J Indian Soc Toxicol 2017;13:21-6.
12. Nohynek GJ, Fautz R, Benech-Kieffer F, Toutain H. Toxicity and human health risk of hair dyes. Food Chem Toxicol 2004;42:517-43.
13. Sampathkumar K, Yesudas S. Hair dye poisoning and the developing world. J Emerg Trauma Shock 2009;2:129-31.

How to cite this article: Rani AG, Bhuvaneshwaran B, Idhaya I. Incidence and pattern of poisoning cases admitted in a tertiary care center. Natl J Physiol Pharm Pharmacol 2020;10(04):309-312.

Source of Support: Nil, **Conflicts of Interest:** None declared.