

Study of Temporary Trends in The Pattern of Poisonings in a Tertiary Care Hospital

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Abstract

Introduction: Acute Poisoning forms one of the commonest causes of emergency hospital admissions. Poisoning both accidental and intentional are a significant contributor to mortality and morbidity throughout the world. A complete review of the risk factors decreases incidence and significant morbidity and mortality rates. The present study aims to characterize contemporary trends in the pattern of poisonings in a tertiary care hospital in Chennai, Tamil Nadu.

Materials and Method: The study was conducted in tertiary care hospital [Saveetha Medical College and Hospital] for a period of one year [from January 2018 to December 2018]. The data was obtained retrospectively from medical case sheets and various parameters such as sex ratio, occupation, poison type, etc., were analyzed and compared with other studies.

Results: The study population consists of 294 cases, among which 232 were suicidal and 62 were accidental. Female predominancy was reported in the present study, with the prevalence of poisonings more common among the age group 21-30y years. Household poisons like insecticides and rodenticides were the most commonly administered. Most of the patients admitted were skilled workers and homemakers.

Conclusion: Poisoning was more common in young adults, particularly females. Insecticides and rodenticides were major causes of poisoning, with the higher incidence among skilled workers. Highly equipped treatment facilities and establishment of poisoning centers have become the need of the hour.

Keywords: *Insecticides, poisoning, household poisons, poison information center.*

Introduction

Poison is a substance (solid, liquid or gas), which if introduced in a living body or brought into contact with any part thereof would produce disease or even death by its constitutional or local effects or both ⁽¹⁾. Death due to poisoning has been known since time immemorial ⁽²⁾. In the present world, there has been reports of increased morbidity and mortality due to

poisoning. It has posed a major health distress to all parts of the world in various degrees. Toxicology is the science dealing with properties, actions, toxicity, fatal dose, deduction and estimation of, interpretation of the results of toxicological analysis and treatment of poisons ⁽¹⁾. Among the unnatural deaths, death due to poisoning comes next to road traffic accidents ⁽³⁾.

Pattern of poisoning in a region depends on various factors which include availability and access to the poison, socioeconomic status of an individual, cultural and regional influences etc. Poisons include chemicals, biological agents and radioactive substances which may be in the solid, liquid or gaseous state. Rapid industrialization, introduction of newer range of drugs for treatment and massive use of pesticide in agriculture

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has increased the incidence of poisoning⁽³⁾. Agricultural poisoning, death due to snake bite, household poisoning and poisoning due to pharmaceutical products have shown a rise in the recent times⁽²⁾.

Both cases of intentional and unintentional poisonings are seen. Intentional poisonings include homicidal and suicidal poisonings. According to the legal system of our country, all poisoning death cases are recorded as unnatural death and a medico-legal autopsy is routine⁽²⁾. Knowledge of general pattern of poisoning in a particular region will help in early diagnosis and treatment of cases, thus decreasing the rate of morbidity and mortality. Hence this study was carried out with the objective to find out the contemporary trends in the pattern of poisonings in a tertiary care hospital.

Materials and Method

A retrospective study on pattern of poisonings was conducted in Saveetha Medical College and Hospital, Thandalam, Chennai. The study included various poisoning cases reported in the Emergency Department of the hospital during the year 2018 (January 2018 -- December 2018). Data collection was done as per the hospital rules and regulations. Permission from both Forensic Medicine Department and Medical Records Department was obtained prior to data collection.

The study included all poisoning cases like household poisoning, agricultural poisoning, poisoning

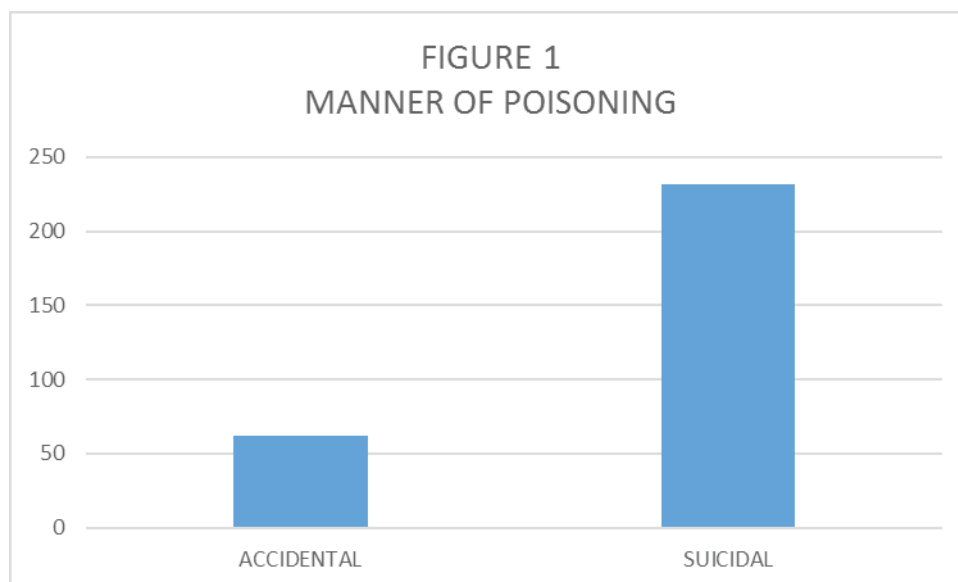
due to pharmaceuticals, food poisoning, and poisoning due to snake bite. The study population consisted of 294 cases that included people of all age groups, right from 5 months to 83 years. Details regarding age, sex, occupation, time taken of hospitalization after ingestion of poison, condition at the time of hospitalization, manner of poisoning, mode of administration, type of poison and marital status of the patient were collected from the hospital records, documented in a pre-structured proforma and analyzed. Socioeconomic status of the patient could not be analyzed as information regarding educational status and percapita income was not available.

INCLUSION CRITERIA: ALL CASES OF ACUTE CHEMICAL, PHARMACEUTICAL, FOOD POISONING AND SNAKE BITE CASES IRRESPECTIVE OF AGE AND SEX.

EXCLUSION CRITERIA: CASES OF ANIMAL EVENOMATION (WITH THE EXCLUSION OF SNAKE BITE CASES) AND ALLERGIC DRUG REACTION.

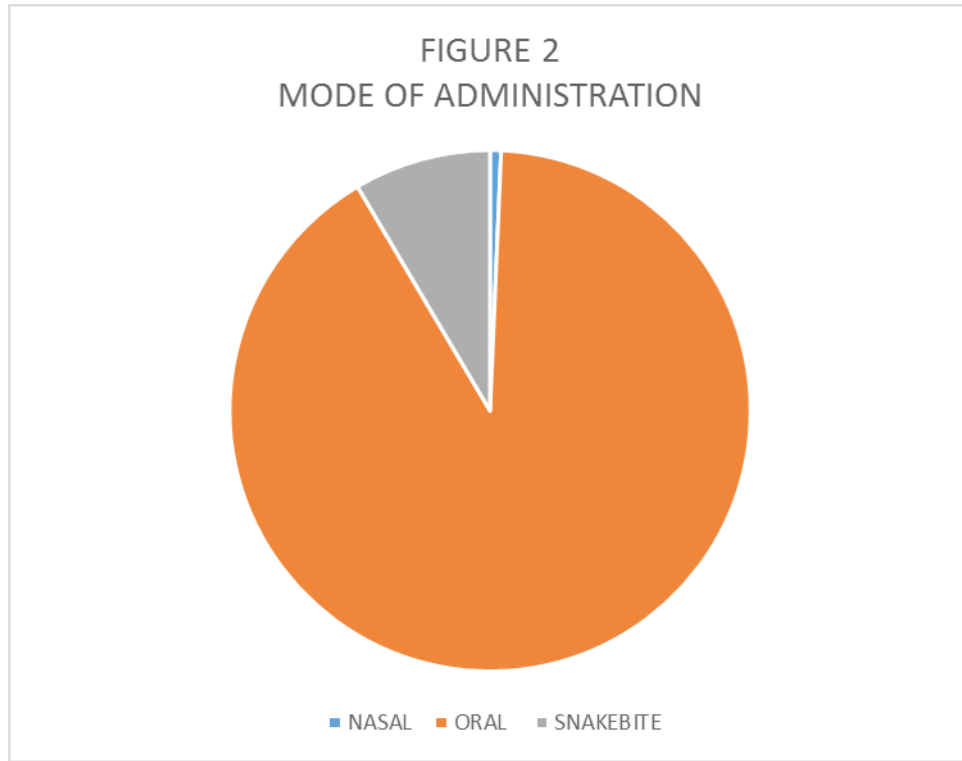
RESULTS

A total of 294 poisoning cases were reviewed, out of which, 232 (78.911%) were suicidal and 62 of them (21.088%) were accidental, indicating a majority to be of intentional type of poisoning [Refer FIGURE 1].



The study revealed that poisoning among female population (52.21%) was higher when compared to that of male population (42.278%) and it was found that poisoning was common among the unmarried (54.421%) than among the married (43.877%).

Among the cases reported, around 90.816% were found to be due to ingestion of chemicals like insecticides and other cleaning agents. Also poisoning due to snake bite and inhalation of toxic substances were reported [Refer FIGURE 2].



The incidence of poisoning was found to be the highest among individuals aged between 21-30 years followed by those aged between 11-20 years. Poisoning cases of individuals belonging to the age group 31-40 years, 41-50 years, those above 50 years and of those 10 years and below were reported [Refer TABLE 1].

Table 1

Age	No. of Poisoning Cases	Percentage
LESS AND EQUAL TO 10	17	5.782
11-20	79	26.87
21-30	114	38.775
31-40	47	15.986
41-50	20	6.802
51-60	6	2.04
ABOVE 60	7	2.38
UNKNOWN	4	1.36

Poisoning rates were high among skilled workers (69 out of 294 cases) and homemakers (52 out of 294 cases). Least number of cases were reported among the unemployed class.

TABLE 2: Poisoning rate among people of different occupational status is as follows.

Occupation	No. of Poisoning Cases	Percentage Of Poisoning Cases
HOMEMAKERS	52	17.687
STUDENT	51	17.346
CLERICAL	6	2.04
CHILDREN[OF AGE GROUP 1-6 YEARS]	13	4.421
SEMI-PROFESSION	16	5.442
PROFESSION	4	1.36
SKILLED	69	23.469
UNSKILLED	32	10.884
UNEMPLOYED	1	0.34
UNDETERMINED	50	17.006

Refer TABLE 3. Analysis of the poisoning cases revealed poisoning rates to be high during the month of July, January, August and November

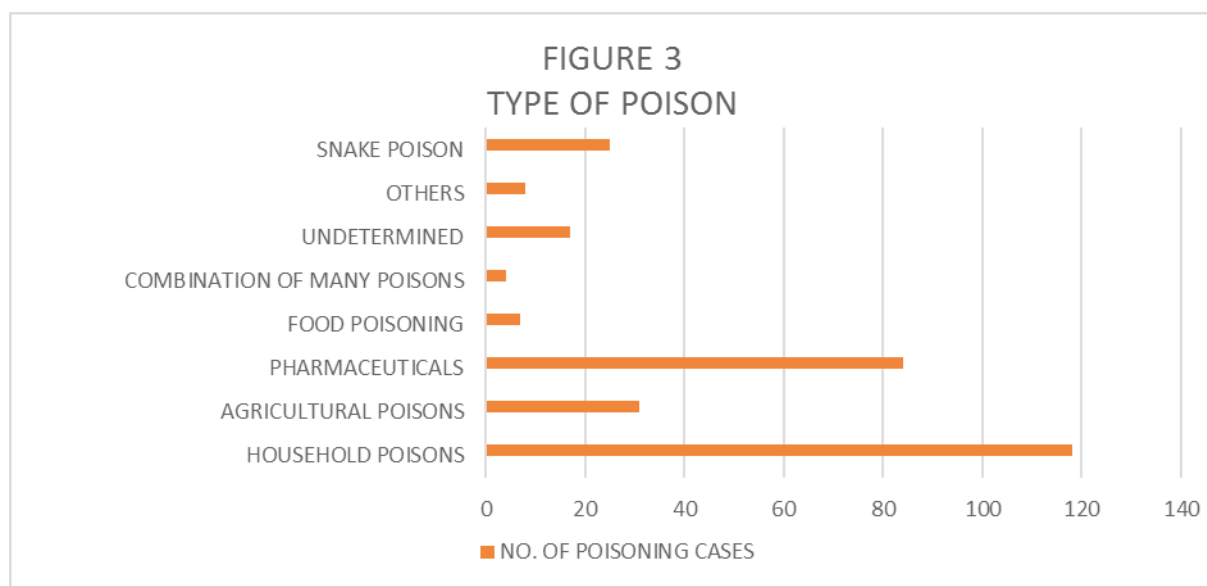
MONTH	NO. OF POISONING CASES	PERCENTAGE OF POISONING CASES
JANUARY	27	9.183
FEBRUARY	22	7.482
MARCH	23	7.823
APRIL	25	8.503
MAY	24	8.163
JUNE	9	3.061
JULY	40	13.065
AUGUST	27	9.183
SEPTEMBER	26	8.843
OCTOBER	26	8.843
NOVEMBER	28	9.523
DECEMBER	17	5.782

Most of the patients(about 96.598) were conscious at the time of hospitalization. Only 0.34% was found to be delirious, 0.68% to be semi-conscious and 2.38% to be unconscious.

The study revealed that the most common type of poison consumed were household poisons which included insecticides, rodenticides, detergents, disinfectants, kerosene, petrol, corrosive acids, disinfectants, medicated oil, rust preventive oil and matchsticks and pharmaceuticals which included antacids, anti epileptics, anti anxiety drugs, antibiotics, NSAIDS, antidiarrhoeal drugs, antidepressants, hypoglycemics, multivitamins, anti hypertensives, antihistaminics, antifungals, anti hypertensives, antimalarial, antiseptics, antitussives, antivirals, antiparkinsonian drugs, calcium channel blockers, antiadrenergics, hypolipidaemics, cholinesterase inhibitors, sedatives-hypnotics, iron and other nutritional supplements. There were also cases of poly pharmacy poisoning.

Agricultural poisons like fertilizers, herbicides, oleander leaves, pesticides, flowers and seeds were the second most common cause of poisoning. Accidental food poisonings have also been reported which included poisoning due to consumption of lizard fallen food and some seafood. Rate of poisoning due snake bite was found almost equal to that of agricultural poisoning.

Interestingly, poisoning due to combination of various substances such as calcium channel blockers and NSAIDS along with disinfectants, pesticides along with herbicides and rodenticides, rodenticides along with kerosene, rodenticides along with insecticides, thyroxine tablets along with disinfectants have been reported . Acetonide poisoning, poisoning due to ammonia, hydrocarbon, paint varnishes, paint thinners and tensene were also reported. Some of the poisons were undetermined .



[Refer FIGURE 3]: Type of poisoning is categorized as follows

Out of the total poisoning cases reported, about 31.63% were hospitalized within the time frame of 1-3 hours after ingestion of poison. 29.591% were hospitalized within less than an hour, 11.34% hospitalized within 3-5 hours and the remaining after 5 hours of ingestion.

Discussion

The occurrence of 294 cases in a single hospital

within a period of 12 months signifies the seriousness of poisoning in this region. Poisoning rates were found to be high among the female population. Although it contradicts with studies like Bhagora et al., Gopal et al. and Panda et al., foreign studies like Tufekci et al and Kavalci et al support the present study with female dominancy in poisoning cases (4-8). Poisoning was more commonly seen in young adults ,especially in the age group of 21-30 years. Stress is believed to be the

major cause. Mental strain and pressure during studies, unemployment, financial problems, marital conflicts, etc., may aid the reason.

Most of the poisoning cases reported were found to be suicidal and showed similarity with results of studies like Sharma BR et al., Karamjitsingh et al., and Sanjeev Chaudhry et al.⁽⁹⁻¹¹⁾. Although accidental poisoning can occur at any age, it was found to be more common in children less than 10 years of age. Snakebite was the main cause for accidental poisoning. Almost all cases of suicidal poisonings were by the consumption of chemicals and other pharmaceutical agents.

In this study, poisoning rates among unmarried population outnumbered married ones that contradicts with other studies⁽¹²⁻¹⁵⁾, in which more no. of poisonings were seen among married people. The incidence of poisoning was higher during the months of July followed by November. This contradicts with studies conducted in India that showed more incidences during summer⁽¹⁶⁾. Some studies also show increase in poisoning during rainy season⁽¹⁷⁾ and supports the present study. There are studies which show that there is a relationship between summer suicide rates and biochemical, metabolic and immune variables⁽¹⁸⁾.

The study revealed increase in the number of poisoning cases due to household poisons. There is dissimilarity seen when compared to studies conducted in western countries^(17,19,20) and in India, where agrochemicals were the most common poisoning agents^(14, 16, 21, 22). Household poisons consumed included insecticides and rodenticides. Availability of different kinds of household products due to advancement in science has a influence on the increase in intentional household poisoning. Easy accessibility of drugs has made them the second most common poisoning agent. Occupation and area of residence has an influence on the availability of poisons. In the previous decade farmers were more in number and used agrochemical agents as poisons. But today, with development of industries and increased manual empowerment, there is a change seen in the type of poison consumed. People have better access to pharmaceutical agents and household poisons. The area where this hospital is located has many industries in the neighborhood and hence shows a rise in poisoning due to household poisons and pharmaceuticals.

Conclusion

In the present study, females were affected more than males with the higher of incidence among people of 21-30 years of age. Unmarried cases outnumbered married ones. Most common type of poisons administered were household poisons. Among them majority were insecticides and rodenticides. Incidence of poisonings were found to be the highest among skilled workers, particularly company workers which may be due to the prevalence of multiple companies in the area.

Highly equipped treatment facilities, establishment of poison information centers and surveillance centers have become the need of the hour. Extending psychiatric services to the community may help in identifying high risk population who are likely to commit deliberate self-harm.

Conflict of Interest: Nil

Source of Funding: NIL

Ethical Clearance: Nil

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