Demographic Profile of Poisoning Cases in a Tertiary Care Center in South India – An Observational Study

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Abstract

The word 'poison' has been evolved from the Latin word 'potion' i.e. 'to drink for health', but in the due course of time the definition of 'poison' has changed reversibly to its present form i.e. any substance which when administered, inhaled or ingested is capable of acting deleteriously on the human body. In the current study we have aimed at determining the demographic profile of poison cases reporting to our institute. This prospective study was carried out involving 353 cases of poisoning admitted in Sri Ramachandra Medical College & Research Institute, Sri Ramachandra University, Porur, Chennai, during the period of June 2014-June 2015. Age-wise distribution of poisoning cases revealed that the maximum cases are in the age group of 20-29 years and the incidence decreased as the age increases. It is evident that the incidence of poisoning is more in case of females when compared to males. Occupation-wise distribution revealed poisoning is more common among people who are skilled workers contributing 167 cases. Socio economic status wise distribution revealed poisoning is more common among the people who belong to Upper middle (52%), followed by 33% of cases belong to Middle class. Poisoning is more common among married people when compared to unmarried people. Out of 353 cases, 203 cases were married, which accounts for 58%, 150 cases were unmarried, which accounts for 48%. Distribution of the study population based on the type of family revealed that out of total 353 cases, 299 cases belonged to nuclear family. Persons who belong to joint family were 46 in number.

Key Words: *Poisoning in South India, demographic profile, age-wise distribution, marital status.*

Introduction

The word 'poison' has been evolved from the Latin word 'potion' i.e. 'to drink for health', but in the due course of time the definition of 'poison' has changed reversibly to its present form i.e. any substance which when administered, inhaled or ingested is capable of acting deleteriously on the human body. Thus, almost anything is poisonous and there is really no boundary between medicine and poison.[1] The way a poison is controlled depends on its potential for harm, its usefulness and the reasons for its use. The law has a right and a duty pursuant to the police power of a state to control substances that can do great harm.[1]

Poisoning as a mode of death is known from antiquity. Poisoning among all age groups and both sexes is seen everywhere and the incidence of poisoning with reference to insecticides, pesticides, hair dye, cleaning acids and rodenticides has become more common than the others in the recent times because

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of increased availability and indiscriminate use of the various pesticides in agricultural areas.[2]

The incidence of poisoning in India is among the highest in the world, it is estimated that more than 50,000 people die every year from toxic exposure. Among children the common culprits include kerosene, household chemicals, drugs, and garden plants.[3]

The trend in poisoning show a change due to introduction of newer pesticides under different classes. At one point historically arsenic was the most popular besides Copper Sulphate, and Barbiturates. In the recent past DDT, Benzene Hexa Chloride, Endrin, Organo-Chlorines and Organo-Phosphorous compounds took the toll. Of late Aluminum Phosphide, Alcohol, hair dye and Carbamates are in vogue. Interestingly, incidences of snake strike deaths are still prevalent and not receding.[2]

Arising out of a growing concern over the burgeoning incidence of poisoning worldwide, coupled with a lack of public awareness about its seriousness, Poisons Information Services made their first appearance in the Netherlands in 1949, there are 75 such certified centers in the USA alone, providing almost any information within a matter of seconds through the use of an intricate, computer information resource system **(POISINDEX)** on more than 800,000 poisonous products. India made a belated foray with the establishment of the National Poisons Information Centre at the All India Institute of Medical Sciences, New Delhi in December, 1994.[2] The World Health Organization has released its Computer Software on Poisons **(INTOX)** for use by the centre.[2] In this study we have aimed at determining the demographic profile of poison cases reporting to our institute.

Materials and Method

This prospective study was carried out involving 353 cases of poisoning admitted in Sri Ramachandra Medical College & Research Institute, Sri Ramachandra University, Porur, Chennai, during the period of June 2014- June 2015. The study was approved by scientific and ethics committee of the institute.

Inclusion Criteria

- All cases of Poisoning either suicidal or accidental, both directly admitted and referral cases during the period of June 2014 – June 2015.
- Snake Strike and Scorpion stings.
- Domestic as well as Commercial Poisoning.

Exclusion Criteria

- Cases without proper diagnosis (undetermined).
- Outside body brought to SRMC mortuary with history of poisoning.

Methodology

The demographic details like age, socioeconomic status by modified Kuppusamy scale (Annexure 1), marital status, time of the day during which poisoning has occurred, type of family were acquired from the patient, relatives, friends or the investigating officer and by going through the medical records and the inquest report. Among the admitted cases, if some turn out to be fatal, in those cases post mortem examination is done All the data collected in the Performa were complied and analyzed statistically using SPSS software version 15.

Observation and Results

Distribution of the study population based on age, gender, marital status and type of family is shown in table 1. The minimum age affected was 1 year old and maximum age affected was 80 years. Mean age of the study population was 28 years. Incidence of poisoning was also reported to be more in case of females when compared to males. The incidence of poisoning was also reported to be more in number among married individuals and in nuclear families. Modified Kuppusamy scale (Annexure 1) was used to assess the socio-economic status and based on this distribution of the poisoning cases bases on occupation, education status and socio economic status are mentioned in Table 2, 3 and 4 respectively. And based on the above observation it is also evident that the incidence of poisoning is more in upper middle class group.

Table 1: Distribution of Study population based on age,gender, marital status, and type of family (n=353)

Age (years)	Frequency (%)
1 – 9	39 (11.0)
10 - 19	57 (16.1)
20 – 29	127 (36.0)
30 – 39	55 (15.6)
40 – 49	34 (9.6)
50 – 59	27 (7.6)
60 – 69	9 (2.5)
70 – 79	4 (1.1)
80 - 89	1 (0.3)

Gender	Frequency (%)
Male	160 (45.3)
Female	193 (54.7)
Marital status	
Married	203 (57.5)
Unmarried	150 (42.5)
Type of family	
Nuclear	299 (84.7)
Joint	46 (13.0)
Extended	8 (2.3)

Table 2: Distribution of study population based on occupation (n=353)

Occupation	Frequency (%)
Unemployed	58 (16.4)
Unskilled Worker	8 (2.3)
Semi skilled worker	94 (26.6)
Skilled worker	163 (47.3)
Farmer	23 (6.5)
Semi professional	3 (0.8)
Professional	0 (0.0)

Table 3: Distribution of study population based on education status (n=353)

Education	Frequency (%)
Non literate	2 (0.6)
Primary school	27 (7.6)
Middle school	25 (7.1)
High school	118 (33.4)
Intermediate	172 (48.7)
Graduate	9 (2.5)

Table 4: Distribution of study population based on Socioeconomic status (n=353)

Class	Frequency (%)
Upper	0 (0.0)
Upper middle	182 (51.6)
Middle	117 (33.1)
Upper lower	54 (15.3)
Lower	1 (0)

Discussion

The total number of cases admitted in Sri Ramachandra Medical College and Research Institute from June 2014 to June 2015 was 26,190 cases, out of which 4,498 cases were Medico-Legal Cases (MLC). Among the MLC, poisoning accounts for 353 cases. As the institute is a tertiary care centre, the numbers of cases are more when compared to most of the other studies to which this research work is compared. When compared to the studies done by mani et al which was a retrospective study for a period of three years, the total number of poisoning cases was 365 and other studies done by Bharath K Guntheti Udaypal Singh[4], Unnikrishnan B, Singh B, Rajeev A[5], Ansam F Sawalha., Waleed M Sweileh., Maysoon T Tufaha. and Dua Y Al-jabi [6], the number of cases were considerably more in our study.

In the current study age-wise distribution of poisoning cases revealed that the maximum cases are in the age group of 20-29 years and the incidence decreased as the age increases (Table 1). Young adults are affected more as they are more exposed to stressors

like job, marital issues, financial problems etc., The results of the studies conducted by, Bharath K Guntheti Udaypal Singh [4], Shreemanta Kumar Dash, Manoj Kumar Mohanthy, Kiran Kumar Patnaik, Sachidananda Mohanthy[8], Ramanath K.V. Naveen Kumar H.D[9], Shoaib Zaheer.M, Aslam.M, Vibanshu Gupta, Vibhor Sharma and Shadab Ahmad Khan[10], Dr. Gargi.J, Dr. Hakumat Rai, Dr. Ashok Chanana, Dr.Gurmanjit Rai etal [9,] Tejas Prajapati, Kartik Prajapati, Rakesh Tandon, Saumil Merchant [11,] .

Sex-wise distribution of poisoning cases in our study revealed that out of the total 353 cases, 160 cases i.e (45.3%) were males and 193 cases i.e (54.7%) were females and it is evident that the incidence of poisoning is more in case of females when compared to males (Table 1). Similar findings were also noted in the study conducted by Deepak Pokhrel, Sirjana pant, Anupama Pradhan, Saffar Mansoor [7]**.** However, male dominance is noted in the studies conducted by Shreemanta Kumar Dash, Manoj Kumar Mohanthy, Kiran Kumar Patnaik, Sachidananda Mohanthy [6,] Ramanath K.V. Naveen Kumar H.D.[8] Shoaib Zaheer.M, Aslam.M, Vibanshu Gupta, Vibhor Sharma and Shadab Ahmad Khan,[10] Dr. Gargi.J, Dr. Hakumat Rai, Dr. Ashok Chanana, Dr.Gurmanjit Rai etal,[14] Unnikrishnan B, Singh B, Rajeev A [5] Ansam F Sawalha., Waleed M Sweileh., Maysoon T Tufaha. and Dua Y Al-jabi [7] .

In the present study occupation-wise distribution showed that poisoning is more common among people who are skilled workers contributing 167 cases, followed by Semi – Skilled workers 94 and 58 Unemployed. The second least was Semi – Profession with 3 people. This is due to the fact that middle class people are subjected to more stress from the developing world (Table 2). In the study conducted by mani et al showed similar results with farmers (29.86%) followed by housewives (23.38%) and least common among businessmen (0.54%). Study conducted by Ramanath K.V. Naveen Kumar H.D **[9]** also showed similar results i.e. commonly involved groups are farmers (38.4%), followed by housewives (21.9%). Study conducted by Shreemanta Kumar Dash, Manoj Kumar Mohanthy, Kiran Kumar Patnaik, Sachidananda Mohanthy **[8]** Vinay B shetty. Gurudatta S Pawar., Inamadar **[13]** also reveals that, skilled workers topped the list. However, in their studies housewives occupied 3rd position.

In the current study among the 353 cases, people who have graduated till Post High School/ Diploma/ College(Intermediate) are the common victims in poisoning, amounting to 172 cases which indirectly denotes the people who are skilled workers, followed by 118 high school people, who are semi – skilled workers and Non – literate and graduates are very less, together counting 11. These findings of the study go in hand with other studies.

In our study, socio economic status wise distribution revealed poisoning is more common among the people who belong to Upper middle (52%), followed by 33% of cases belong to Middle class. As per the Monthly Income distribution, people who earn between Rs. 16,020 – Rs. 32,049 are most commonly affected with the maximum count of 176, followed by people who earn between Rs12,020 – Rs16,019, which includes 110 posioning .People earning above Rs. 32,050 and below Rs. 4,810 are least affected. The system used in calculating the socio-economic status was modified Kuppuswamys classification (Table 4). The inference which other studies have obtained is almost the same, as middle class people are the most commonly affected ones and the variation in the upper middle and lower middle may be due to the status of the hospital and the affordability. Similar studies with similar classification of economic strata was done by Shoaib Zaheer.M, Aslam.M, Vibanshu Gupta, Vibhor Sharma and Shadab Ahmad Khan [10] reveals that majority of cases belongs to Class iii and Class iv, followed by class v and vi and least among class i and ii. (57.69%, 32.69% and 9.61%), which is similar to our study (79.44%, 14.78% and 5.74%).

Marital status wise distribution of our study population revealed that poisoning is more among married people when compared to unmarried people. Out of 353 cases, 203 cases were married, which accounts for 58%, 150 cases were unmarried, which accounts for 48% (Table 1). In the study conducted by Mani et al yielded the same type of results that Married males (41.36%) are more affected, followed by married females (22.19%). Unmarried males (20.00%) and unmarried females (16.43%) are the least. Study conducted by Bharath K Guntheti Udaypal Singh **[4]** also yielded the same kind of results that poisoning was more common in married men (67.92%), followed by unmarried males (17.92%), married females (12.74%) and unmarried females forms only (1.39%) of poisoning cases.

In the current study distribution of the study population based on the type of family revealed that out

of total 353 cases, 299 cases belonged to nuclear family. Persons who belong to joint family were 46 in number and only 8 persons who live in extended families were affected (Table 1). Except four studies, many of the studies did not use this family pattern as a parameter in their study. This is one of the important parameter to consider as in the current developing and busy life many forget the elementary aspects and basic morals of life and the advantages of being in a joint family are missed in the current era. The studies of Unnikrishnan B, Singh B, Rajeev [5], Dr. Gargi.J, Dr. Hakumat Rai, Dr. Ashok Chanana, Dr.Gurmanjit Rai et al[14] also revealed the same kind of results to help the physician in the treatment aspect and I also like to state the public awareness on producing the proof of poisoning is amazing. As the substances consumed were produced it was easy and confident to proceed with the treatment aspect for the physician and it would have been as an important reason for the overall less mortality rate.

Conclusion

A study of the demographic profile of poisoning cases admitted in the casualty was carried out in the department of Forensic Medicine & Toxicology of Sri Ramachandra Medical College and Research Institute, Porur, Chennai. The following observation was made :

- Poisoning is more common among the adult (20 to 29 years) age group, with a mean of 28 years.
- 70 Children (20%) are also affected, which are mainly accidental in nature.
- Poisoning was more common among females (54.7%) when compared to males(45.3%).
- Profession wise skilled workers are affected the most (167 cases). They form the major part of the middle class. Semi skilled and unemployed are also affected more.
- Education wise people who have graduated from college with a diploma and other post high school courses are affected more as these people usually form the middle class society.
- Married persons (58%) are more affected more when compared to unmarried persons(42%).
- Family pattern wise, people who live in nuclear families are affected more (299 cases) when compared to people who live as joint families (46 cases).

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Ethical Clearance: The study was approved by the Ethics committee of the institute

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