Profile of Deaths Due to Poisoning: Autopsied at Ssims & Rc - A Cross Sectional Study

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Abstract

Poisoning is an important health problem in every country of the world and it is a known fact that the incidence of poisoning in India is highest and it is estimated that more than 50,000 people die every year from poisoning[1]. Poisoning affects all age groups from infants to seniors, but poisoning in teens and adults are more serious and it contributes to morbidity and mortality. Due to easy accessibility of poisons and lack of awareness, self-poisoning deaths are more common. In most of the poisoning deaths, the poison consumed was unknown at the time of autopsy but Forensic Science Laboratory plays a vital role in detection of poison. With this background, the present study has been carried out to determine the profile of poisoning cases, autopsied at SSIMS&RC, DAVANGERE, KARNATAKA. The study revealed that more number of poisoning is seen in males (62.3%) as compare to females (37.7%). Common age group affected is 21 to 30 years, followed by 31 to 40 years and least in 41 to 50 years. Agriculture group is commonly affected, followed by unemployed and least in government employees. Majority of victims belongs to lower socioeconomic group (84%). The suicidal deaths by poisoning (97%) being highest followed by homicidal and accidental.

***Key words**: Autopsy, FSL Report and Poisoning.*

Introduction

Till today poisoning remains one of the commonest causes of unnatural death. Annually it has been estimated that the health hazards are directly or in directly due to poisons is for more than 1 million illnesses worldwide, and this could be just the tip of the iceberg as most of the cases of poisoning actually go unreported and untreated, especially in developing and underdeveloped countries.[1]

Poisoning being invariably medico legal in nature among fatal cases, postmortem examination is done to establish the exact cause and manner of death. Manner of death in these cases is predominately suicidal because of the general belief that it terminates life with minimal sufferings. Even accidental or homicidal cases are also reported and alleged which was more prevalent in the past as there were no well established means of detecting poison from the viscera, etc. and it was believed that if dead body was black, blue, or spotted in places or smelled bad, the cause of death was a poison. With the advent of modern techniques of chemical analysis, this method of committing homicide has lost its grounds.[1]

The commonest cause of poisoning in India and other developing countries is pesticides, the reasons being agriculture based economics, poverty, unsafe practices, illiteracy, ignorance and lack of protective measures and easy availability of highly toxic compounds. [2] The attempt has been made in the present study to know the commonest group or type of pesticide involved, commonest age group affected, socio-economic status, gender and occupation affected in poisoning and to know the manner of poisoning.

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Materials and Method

The present study has been carried out after obtaining the ethical clearance and consent from the relatives to take the relevant information. All the cases brought to the department of Forensic Medicine and Toxicology, SSIMS and RC, Davangere, for medico legal autopsy with history of poisoning and cases that were diagnosed as poisoning after post mortem examination during the period of one and half year, from November 2013 to March 2015. Total 61 cases were selected for this prospective study.

In all cases of poisoning the detailed history and information were collected from the police and the relatives of the deceased questionnaire, and post mortem findings were analyzed with the chemical analysis reports. In case of hospital admitted and treated cases the information's were collected by the perusal of hospital records. In cases of allegations, information was supplemented by either visit to the scene of crime or from the photographs of the scene of crime. The cases of food poisoning, snake bite and any other insect bite envenomation and deaths due to idiosyncratic reaction to the drugs were excluded from the study group.

Meticulous autopsy was done in all cases and the routine viscera and body fluids were collected and sent to Forensic Science Laboratory for Chemical analysis and report. After obtaining the report from the Forensic Science Laboratory, the results of the report and information acquired from the relatives and the investigating officer were entered into the standard proforma for further study.

Results

Total 61 cases were selected for the present study and the following observations were made. It has been observed that maximum number of poisoning in the study population are seen in males (62.3%) as compare to females (37.7%). Out of total 61 cases males were 38 in number and females were 23 in number (Table No 1).

Table No 1: Distribution of study population according to Gender.

Gender	Frequency	Percentage (%)
Female	23	37.7
Male	38	62.3
Total	61	100.0

The study revealed that more number of poisoning in the study population are seen in the age group of 21 to 30 years (34.4%), followed by 31 to 40 years(19.7%), 0-20 years (18%), above 51 years(16.4%). and the least number of cases seen in the age group of 41 to 50 years (11.5%) (Table No 2).

Table No 2: Distribution of the study population according to Age

Age group (Years)	Frequency	Percentage (%)
0-20	11	18.0
21-30	21	34.4
31-40	12	19.7
41-50	7	11.5
Above 51	10	16.4
Total	61	100.0

From the study it is observed that more number of cases seen among the agriculture group (42.6%), followed by unemployed population (32.8%) and least is seen with government employs (1.6%) (Table No 3).

Table No 3: Distribution of study population according to Occupation

Occupation	Frequency	Percentage (%)
Government	1	1.6
Private	5	8.2
Self-employed	7	11.5
Agriculture	26	42.6
Unemployed	20	32.8
Others	2	3.3
Total	61	100.0

The study revealed that the victims belongs to lower Socio-economic group are most commonly affected (84%), followed by middle class (13%) and upper class (3%) (Table No 4).

Table-4: Distribution of the study population according to Socio Economic Status.

Socio Economic Status	Frequency	Percentage (%)
Upper	2	3.3
Middle	8	13.1
Lower	51	83.6
Total	61	100

From the study it is observed that more number of poisoning cases were suicidal (97%) in nature, followed by homicidal and accidental among the study population (Table No 5).

Table No 5: Distribution of the study population according to manner of poisoning.

Manner	Frequency	Percentage (%)
Accidental	1	1.6
Homicidal	1	1.6
Suicidal	59	96.7
Total	61	100

Organophosphorus (50.8%) group of compound constitutes the most prevalent type of poison involved in the study population, followed by Aluminium phosphide(26.2%), and least being Pyrethroid, Sulphuric acid, Benzodiazepine, Parphenylendiamine and Carbamate. In the present study, in 6% of cases the poisons were not detected on chemical analysis (Table No 6).

Table No 6: Distribution of poisons detected by chemical analysis (FSL).

Chemical Analysis (FSL)	Frequency	Percentage (%)
Organophosphorus	31	50.8
Carbamate	1	1.6
Pyrethroid	1	1.6
Paraquat	3	4.9
Aluminium Phosphide	16	26.2
Alcohol	2	3.3
Sulphuric acid	1	1.6
Paraphenylendiamine	1	1.6
Benzodiazipine	1	1.6
Not Detected	4	6.6
Total	61	100

Discussion

The objectives of the present study are to ascertain the commonest gender and age group involved, occupation, socio-economic status, manner of poisoning, and the commonest type of poison involved in the study population.

Our study has showed the highest correlation with all the parameters when compared with other similar studies done in the past.

Mrinal Haloi and others had studied the cases of suspected poisoning brought to Gauhati Medical college and Hospital during the period of one year, a total sum of 96 cases of suspected poisoning deaths were analyzed. Male victims (62.50%) outnumbered Females (37.50%) and maximum number of cases was in the age group of 20-29 years. Economic status was found to be lower in 66.66% cases and maximum cases (73.95%) are from rural habitat. Organophosphorus compounds were the most common agents responsible for poisoning with 22.91% cases.[3] Our study has shown the similar findings which were in correlation with the study mentioned above.

A study done by B.D Gupta and others for a period of one year among the poisoning cases admitted in the department of Medicine of G G Hospital, Jamnagar during the period of 1-1-2005 to 31-12-2005. A total of 268 cases were registered. A total of 124 cases were due to poisoning and 144 cases due to various bites. Of 124 cases, 89 (71.77%) were males. Majority of the victims fell in the age group of 20-29 (42.74%). Commonest poison was Organophosphorus. Majority of cases were of suicidal cause.[4] The findings of our study were in similar and are in agreement with the above study.

A prospective study done by a Tejus Prajapati and others on poisoning cases(excluding animal bites) which were brought to the Civil Hospital Ahmadabad, from 1st October 2006 to 30th September 2007. Total 366 cases of acute poisoning were recorded over a period of one year. Of these 70.8% were males and 29.2% female. The majority (45.08%) cases were from age group of 21-30 years. 71.6% cases were from rural area. Commonest type of poison was pesticide in 33.9% cases, followed by household chemicals (26.8%), and in 74.6% of cases poisoning was suicidal.[5] The findings of this study are in agreement with our study except the second most commonest poison, in the above study it is household chemicals, but in our study it is Aluminum phosphide, so it is in disagreement with above study.

Vishwajeet Pawar and others did a study at Mahatma Gandhi Institute of Medical Sciences, Sewagram during the period May 2007 to April 2009. During this study cases of poisoning were observed more in males than females. Male to female ratio was 1.4:1. Maximum poisoning cases were seen in the age group of 20-29 years in both sexes. Maximum poisoning cases belong to low socioeconomic group. Insecticides poisoning was the most common and among them Organophosphorus was the commonest. Incidence of suicidal poisoning cases was more than the accidental poisoning. Agriculture was the most common occupation of the victims of poisoning.[6]These findings were in agreement with our study.

Vikram Palimar, & Prateek Rastogi did a retrospective post mortem study at Kasturba Medical College, Manipal, India, during the period of 1992-2004. Of the total 1917 autopsies conducted, 372 cases were due to poisoning, of which 287 cases were due to insecticides with a predominance of organophosphates. More than 90% of poisoning deaths were suicidal. Majority of the victims were males in their third decade of life.[7] These findings were in consistent with our study.

A study was done by Sharma D C & Bhullar.D S at The Chemical Laboratory, Govt. of Punjab. Total of 1000 cases of deaths due to poisoning reported in the chemical laboratory, it was observed that Organophosphorus and Aluminium phosphide were the most common type of poisons consumed in suicidal, homicidal and accidental deaths. Males were three times more prone to poisoning compared to females. Deaths due to poisoning were reported in all age groups, maximum deaths were reported in the prime of age i.e. 21 to 40 years.[8]These above findings were in agreement with our study.

A study was done by Sinha US, Kapoor AK, Agnihotri and Srivastava PC on 285 poisoning cases at SRN Hospital, Allahabad. It was see that males (69.47%) outnumbered the females. Young age group (15-30 years) was predominantly affected. Aluminium phosphide (42.1%) was the poison of choice with mortality being highest, followed by Organophosphorus (17.17%). Manner of poisoning was suicidal (87%) followed by accidental (7.37%).[9]The findings are in agreement with the present study. But the commonest compound detected in our study is Organophosphorus (50.8%) followed by Aluminium phosphide (26.2%), so this finding is in disagreement with the above study.

In a retrospective study carried out at Department of Forensic Medicine, B.M. Patil Medical College. Bijapur, Karnataka. Total 210 fatal pesticide poisoning cases were selected for the study out of 980 medico legal autopsies conducted from 1st January 2003 to 31st December 2009. The study revealed that the age group 21-30 constitutes the majority (38.12%) of victims followed by 31-40 (25.56%). Males outnumbered the females, the male female ratio being 2.6:1. 192 (91.42%) cases were of suicidal in nature. Organophosphorus compounds were prevalent (64.3%), followed by organo-chloro compounds (25.2%) and carbamates (11.5%). The lower socio-economic status (78%) group is commonly affected.[10] these findings were in agreement with our study except the second most prevalent poison, in the study mentioned above, Organo-chloro was second common compound but in our study it is Aluminium phosphide.

Conclusion

Following were the conclusions drawn after a detailed study of 61 cases of poisoning, autopsied at SSIMS and RC, Davangere.

1. Most of the victims are males (62.3%), where the females were of 37.3%.

2. The most common age group involved is 21 to 30 years (34.4%).

3. Most common occupation involved is Agriculture (42.6%).

4. Victims belongs to lower Socio-economic group are most commonly affected (84%).

5. Suicidal deaths were more common (96.7%) when compared to Homicidal and Accidental deaths.

6. Organophosphorus compound was the most commonly found pesticide followed by Aluminium Phosphide in the chemical analysis at Forensic Science Laboratory (50.8%).

In India, prevention of poisoning deaths poses a difficult task, as the cause of poisoning is multifaceted. The agricultural group being frequently exposed to pesticides, chances of suicide is more prevalent of various reasons like, poverty, loss of crops, unemployment and other socio-economic problem. Divorce, dowry, love affairs, illegitimate pregnancy, extra-marital affairs and such conflicts relating to the issue of marriage, play an important role, particularly in the suicide of women in India[2]. In order to minimize the deaths due to poisoning, awareness need to be created among the public about the seriousness of poisoning, implementing the measure to uplift the socio-economic status and to solve unemployment and last but not the least, the law has to be strengthened towards the sale and distribution of pesticides. Establishing the poison control center in every treating hospital may decrease the deaths due to poisoning.

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