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Pattern of Poisoning Cases at a Tertiary Health Care Centre– A Cross Sectional Study.

Vinay Bannur[1], Prasanna S. Jirli[2], Ravindra S. Honnungar[3], Vishal V. Koulapur[4], Somashekhar S. Pujar[4]

[1]Assistant Professor, Department of Forensic Medicine and Toxicology, Krishna Institute of Medical Sciences, Karad; [2]Professor and HOD, [3]Professor, [4]Associate Professor, Department of Forensic Medicine and Toxicology, Jawaharlal Nehru Medical College, Belagavi

ABSTRACT

Introduction and Objectives: Poisons are responsible for more than 3 million cases worldwide annually, India being among the highest contributor. Thus, this study identifies burden of poisoning cases at regional level and helps formulate preventive measures.

Materials and Method: Prospective, hospital based cross sectional study conducted at KLE's Dr Prabhakar Kore Hospital and MRC, with autopsy unit, Belagavi - for 1 year. Data collected using pretested proforma and analyzed.

Results: Total 306 poisoning cases, out of which, 35 cases (11.4%) expired. Highest being pesticide poisoning – 150 cases (49%) and 20 deaths (57.2%). Age group 21 - 30 years was most commonly involved. Male : female ratio - 1.51 : 1 for total cases and 1.69 : 1 for total deaths. Most cases and deaths were suicidal - 67.1% and 80% respectively, common cause being alleged family problems (34.1%). Majority cases were farmers (24.8%). Mortality high in cases coming within 5 hours (19.3%). Majority cases belonged to grade 1 (36.3%) Poison severity score.

Conclusion: Poison management centres should be started at rural places, proper education and mental strength should be imparted to the population to curb intentional cases.

Keywords: *Poison, Poison Severity Score, Pesticide poisoning, Belagavi.*

INTRODUCTION

Poisoning cases, both accidental and intentional (homicidal/suicidal), are a significant contributor to mortality and morbidity throughout the world[1].

Poisoning cases and deaths due to poisoning are on a rise over the years despite of the advanced knowledge and newer techniques available for management. According to WHO, more than 3 million acute poisoning cases with more than 2,20,000 deaths occur annually worldwide. Of these cases, 90% of fatal poisoning occur in developing countries particularly among agricultural workers[1,2].

Corresponding Author:
Dr. Vinay Bannur
Assistant Professor,
Department of Forensic Medicine and Toxicology,
Krishna Institute of Medical Sciences, Karad–415110
Email: vincyman.u7@gmail.com

According to an estimate, number of poisoning cases in India was 39254 in 1991 and risen to an alarming level of 60809 cases in 1995[3], making our country one of the highest incidence of poisoning in the world. It is estimated that more than 50,000 die every year from toxic exposure[4].

Mortality from poisoning varies from country to country depending upon type of poisons encountered, extent of awareness about poisoning, availability of treatment facilities and presence or absence of qualified personnel. In developed countries rate of mortality from poisoning is as low as 1–2%, but in India it varies from shocking 15–35%[5].

In spite of such alarming levels of mortality and morbidity, no statistics are available in India regarding incidence of poisoning at home or at hospital. This may be due to lack of data at central level as most of the cases are not reported. The known cases are just as the tip of the iceberg.

Considering the above points, the objective of this study is to report promptly the pattern and incidence of poisoning cases at a regional level (like district level in this study) and point out the changing patterns of poisoning regarding various parameters and draw attention to various efforts which can be made to reduce the number of poisoning cases.

AIMS AND OBJECTIVES

1. To study pattern of poisoning cases coming to a tertiary health care centre.
2. To study the relation between poisoning cases and influencing factors.
3. To know the burden of poisoning cases in our tertiary care centre.

REVIEW OF LITERATURE

Poison is any substance (solid, liquid or gas), which if introduced into the living body, or brought in contact with any part thereof, will produce ill effects or death, by its constitutional or local effects or both[1].

History of poisons and poisoning dates back several thousand years and is spread through different parts of the world, including ancient Indian shastras, Egyptian Papyri, Sumerians, Babylonian, Hebrew and Greek records[1].

To determine the annual rate of poisoning-related Accident & Emergency Department visits at Sultan Qaboos University Hospital in Oman, a prospective observational study was conducted over 4 years (1996-1999). 204 poisoning-related Accident & Emergency Department visits were recorded corresponding to an average annual rate of 1.8/1000 Accident & Emergency Department visits. Therapeutic agents were most commonly involved (50% of all cases). Accidental poisoning in toddlers was most commonly caused by drugs. Intentional poisoning in adults involved mainly therapeutic agents (50%), particularly analgesics, followed by industrial and environmental agents (25%). Animal poisoning (14%) was most commonly encountered in adult males. Traditional remedies constituted 7% of all poisoning cases. A total of 148 patients (73%) were admitted for 1 to 175 days[6].

It is a retrospective study conducted during Jan 2009-Jan 2012 in Annapoorana Medical College & Hospitals, Salem, Tamil Nadu, to find out the Profile of poisoning cases in a Tertiary care Hospital, Tamil Nadu 150 cases of acute poisoning in adults due to drugs and chemicals were included, 148 cases were of intentional poisoning and two cases were of accidental poisoning. In all the cases the route of exposure was oral. Males (92 cases) outnumbered females (58 cases) and 101 cases were married. Peak occurrence was in the age group of 21-30 years (47 cases). Occupation wise poisoning was commonly found among male laborers (18.66%) and farmers (13.33%) followed by house wives (28%) and students (16.66%). 147 cases (98%) were Hindus. More cases were reported during summer season (36%) and day time (80%). Organophosphorus was the commonest agent (58.66%). Associated co-morbid conditions were found in 16 cases[7].

A prospective study of poisoning cases (excluding animal bites) 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%, in 74.6% cases cause of poisoning was intentional. Fatality in pesticide poisoning was 25.8%[8].

In a retrospective and prospective study conducted at JSS Medical College, Mysuru, Case records of poisoning cases from January 2005 till January 2008 were reviewed retrospectively and prospectively from January 2008 to September 2009, with objective of assessing the prevalence and mortality incidence rate, A total of 1045 poisoning related admissions were identified, Among them, 68.40% of cases were due to intentional poisoning and 31.60% were due to accidental poisoning. Of the poisoning related admissions, 84.4% of patients recovered, whereas in 7.6% of cases condition did not improve. Mortality rate was observed 4%. Intentional poisoning was observed more in male population (60.2%) in the age group of 18-29 years. Accidental poisoning was seen more in children in the age group of 1-3 years. Incidence of overall poisoning cases were high due to pesticides (39.5%) followed by medicines (26.1%), household products (22.1%), environmental poisoning (12.1%) and heavy metals (0.2%)[9].

MATERIALS AND METHOD

This study is a cross sectional study, conducted at KLES's Dr Prabhakar Kore Hospital and MRC, attached with autopsy block, Belagavi, for a period of one year from January 1, 2014 to December 31, 2014. Data was collected from patients of poisoning cases visiting casualty/wards, poison detection centre reports, their medical records, laboratory reports, autopsy reports and regional Forensic science laboratory reports in fatal cases, by universal sampling method. Informed and written consent was obtained and a preformed, pretested proforma was used to collect the required information.

FINDINGS AND RESULTS

A total of 306 poisoning cases came to the tertiary centre during the study period, out of which, 35 cases (11.4%) expired. Majority of the cases and deaths were literates - 53.3%.

Table 1: Distribution of poisoning cases and deaths on the basis of type of poison

Sl. No.	Type Of Poison	Cases		Deaths	
		Total	Percentage	Total	Percentage
1.	Pesticides	150	49%	20	57.2%
2.	Bites	73	23.9%	05	14.2%
3.	Pharmaceutical Drugs	38	12.4%	02	5.7%
4.	Alcohol + Pesticides	18	5.9%	03	8.6%
5.	Hydrocarbons	06	2%	01	2.9%
6.	Cyanides	05	1.6%	03	8.5%
7.	Unknown	05	1.6%	01	2.9%
8.	Food Poisons	04	1.3%	00	00%
9.	Alcohol	03	0.9%	00	00%
10.	Corrosive Acids	02	0.7%	00	00%
11.	Cerebral Deliriants	02	0.7%	00	00%
Total		306	100%	35	100%

Maximum number of cases and deaths involved pesticide poisoning – 150 cases (49%) and 20 deaths (57.2%) respectively followed by poisoning due to animal bites – 73 cases (23.9%) and 5 deaths (14.2%).

Table 2: Age wise distribution of cases and deaths due to poisoning

Age Group (In Years)	Admitted Cases		Deaths	
	Total	Percentage	Total	Percentage
<10	16	5.2%	03	8.6%
11 – 20	61	20.1%	06	17.2%
21 – 30	117	38.2%	11	31.4%
31 – 40	45	14.7%	04	11.4%
41 – 50	31	10.1%	04	11.4%
51 – 60	25	8.2%	02	5.7%
61 – 70	07	2.3%	02	5.7%
71 – 80	04	1.3%	03	8.6%
> 80	00	00%	00	00%
Total	306	100%	35	100%

Maximum number of cases and deaths were seen in the age group between 21 - 30 years, 117 cases (38.2 %) and 11 deaths (31.4 %) respectively.

Table 3: Distribution of cases and deaths due to poisoning in relation to manner of poisoning

Maner of Poisoning	Admitted Cases		Deaths	
	Total	Percentage	Total	Percentage
Suicidal	205	67%	28	80%
Accidental	99	32.4%	16	17.1%
Homicidal	2	0.6%	01	2.9%

Most of the cases and deaths were suicidal - 67.1% and 80% respectively with maximum cases related to alleged family problems-34.1% leading to poisoning.

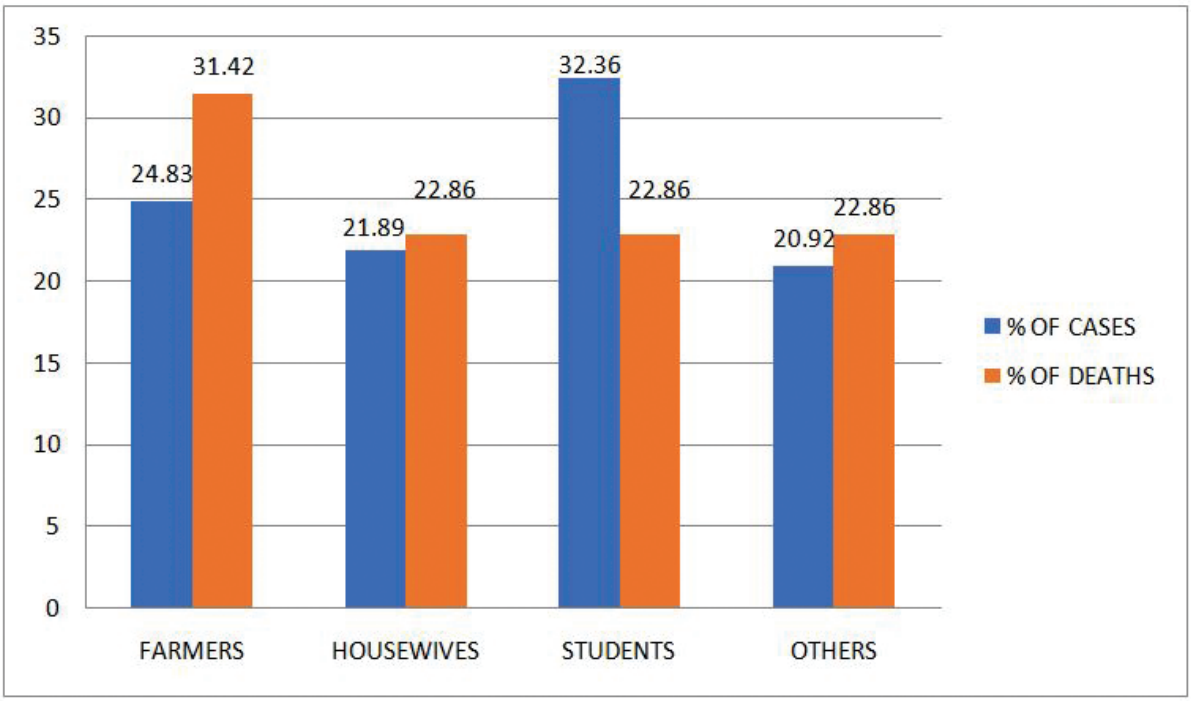
Table 4: Distribution of poisoning cases and deaths in relation to mode of poisoning

Mode of Poison	Admitted Cases		Deaths	
	Total	Percentage	Total	Percentage
Oral	22	74.2%	29	82.9%
Injection	76	24.8%	06	17.1%
Inhalation	03	1%	00	0%
Total	**306**		**35**	

Most common mode of poisoning was oral - 74.2% of cases and 82.9% of deaths followed by injection–24.8% of cases and 17.1% of deaths.

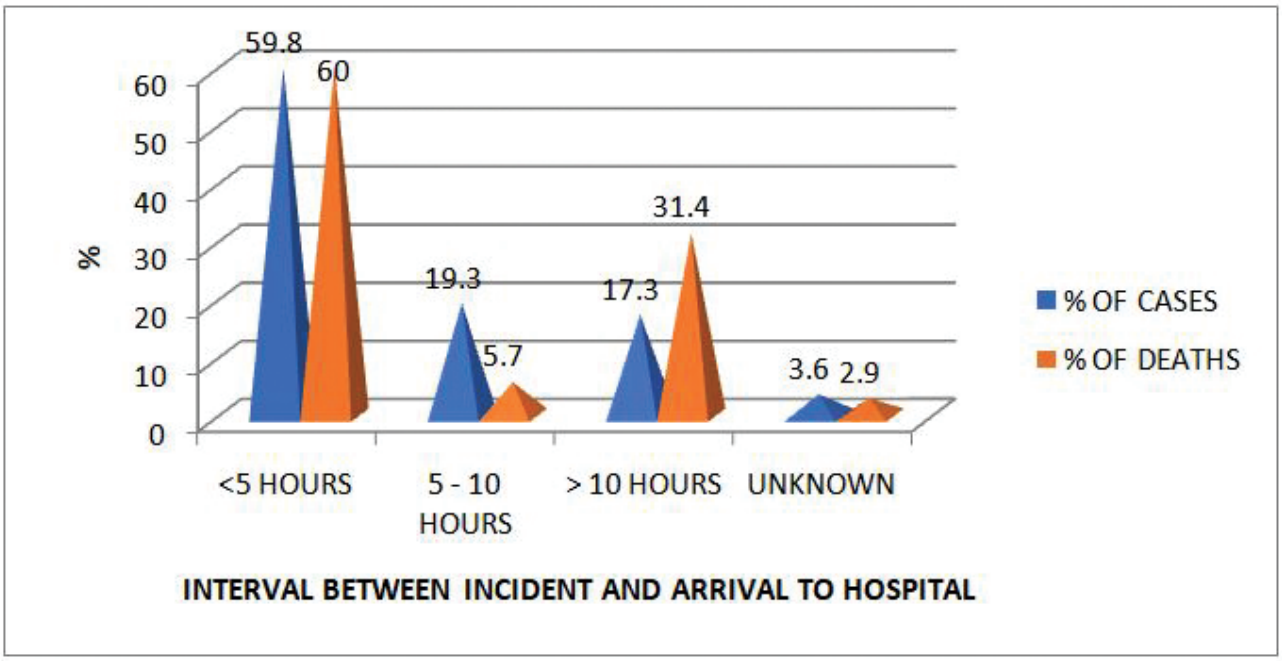
Maximum number of cases and deaths involved males, 184 cases (60.1%) and 22 deaths (62.9%) respectively. Male : female ratio being 1.51 : 1 for total cases and 1.69 : 1 for total deaths.

Maximum cases were seen in the month of June (11.8%) and maximum deaths in January and October (14.2% each). Maximum cases and deaths were seen in winter season 34.6% and 48.6% respectively, followed by rainy season (34.3% of cases and deaths).



Graph 1: Distribution of Cases and Deaths Related to Occupation

Most of the cases were students (32.36%), farmers being the most common occupation involved (24.83%). Most deaths were seen in farmers (31.42%).



Graph 2: Distribution of Poisoning Cases and Deaths Based on Time Interval between Incident and Arrival to Hospital

59.8% of cases came to the tertiary centre within 5 hours of poisoning incident.

Mortality was high in cases coming within 5 hours - 19.3%, followed by cases coming after 10 hours of incident – 17.3%.

210 cases (68.6%) were referred to tertiary centre out of which 22 cases (65.67% of total deaths) expired. Rest 96 cases came directly to the tertiary centre out of which 12 cases (34.3% of total deaths) expired.

Majority of cases belonged to grade 1 – 111 cases (36.3%) of Poison severity score, followed by Grade 2 – 101 cases (33%), Grade 0 – 59 cases (19.3%) and Grade 3 – 35 cases (11.4%) respectively.

DISCUSSION

During the present study period of 1 year from January 1, 2014 to December 31, 2014, a total of 306 poisoning cases were admitted to KLES's Dr Prabhakar Kore Hospital and MRC, Belagavi. Out of these, maximum number of cases were due to pesticides – 150 cases (49%).This result is similar to the results conducted at Annapoorna Medical College and Hospitals, Salem, Tamil Nadu with 58.66%[7], JSS Medical College, Mysuru, with 39.5%[9]. In contrast, study at Qaboos University Hospital in Oman shows theraupatic agents were more commonly involved[6]. These differences can be attributed to a number of factors like – India being a developing country depends a lot on agriculture, making pesticides easily available at many homes.

In the present study, out of 306 cases, 35 cases expired which is an overall mortality rate of 11.4%. Studies at JSS Medical College, Mysuru[9] shows mortality of 4% and Civil Hospital, Ahmadabad shows mortality of 25.8%[8]. Age group most commonly involved in this study was between 21 – 30 years, which is similar to study conducted at Annapoorna Medical College and Hospital, Salem, Tamil Nadu[7], at Civil Hospital, Ahmadabad[8], at JSS Medical college, Mysuru[9], at Karad[10] and Bengaluru[11]. Male population is most commonly involved in this study with 60.1% cases and 62.9% deaths due to poisoning, male to female ratio being 1.51:1 for admitted cases and 1.69:1 for deaths, which was the same in other studies with varying percentages. In this study 67% of cases were suicidal, which was again similar to other studies. Triggering factors responsible for these intentional poisoning was studied upon in this study which revealed – maximum cases (34.1%) were due to family related problems. This point was not dealt with in any other study. In this study 53.3% of cases involved literate population, students were involved in 32.3% of cases. These results show that

literate male youngsters are more commonly involved with poisoning cases, which may be due to the fact that males are dominant and bread earning half of a family so is exposed to more stress causing to take such extreme steps in life.

Maximum cases in this study were seen in winter season (34.6%), this result is different in contrast to study conducted at Annapoorna Medical College and Hospital, Salem, Tamil Nadu – where maximum cases were seen in summer season (36%)[7]. In this study 59.8% of cases came to tertiary care within 5 hours of exposure and 68.6% of cases were referred from other hospitals. According to Poison Severity Score–maximum cases belonged to grade 1 (36.3%). No other studies have mentioned about these aspects. Mortality and morbidity increases as the time interval increases.

CONCLUSION

The study clearly shows pesticides are the most common means of poisoning owing to the fact that pesticides are easily available and can cause severe morbidity, leading to deaths. The most saddening fact is that most of the cases involve literate group of people, in the age group between 21–30 years, it's the youth who are committing large number of suicides due to various triggering factors. This shows that poisoning is more of a mental issue to manage and preventive strategies should be formulated accordingly.

The long standing problems of farmers still continues, as they continue to commit suicide due to financial problems and weather problems, which is a tough burden to resolve and requires combined efforts from the government and doctors to reduce this burden. Accidental cases in fields due to animal and insect bites are also increasing due to improper protective measures and lack of proper knowledge which has to be curbed. Industrial poisoning incidents are low compared to other causes. Homicidal cases are rare with only two cases being reported in the whole year.

The study also shows that many cases are being referred from other smaller health centers and hospitals, which are leading to delays in early diagnosis and adequate management. With the introduction of poison detection centre it is helpful to diagnose the poison early and give proper care. Such centers should be increased so that proper care is given over a larger area and delays are reduced.

Conflict of Interest: No

Source of Funding: Self

Ethical Clearance: The ethical clearance was obtained by JNMC Institutional Ethics Committee on Human Subjects Research – Jawaharlal Nehru Medical College, Belagavi.

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