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Original Article

Trends of acute poisoning in south Karnataka

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Abstract
Background: In recent times poisoning with agricultural chemicals either accidental or suicidal has become common due to easy availability and low cost. So it has become essential to find out the burden of poisoning to the victims, family and to hospital and morbidity and mortality among the victims. **Aims:** To determine the trends of poisoning along with various parameters such as mode of poisoning, type of poison used, outcome of the poisoning, the most vulnerable age group, occupation of the victim, and the marital status. **Method:** A 5 year retrospective study in which all the patients of acute poisoning admitted to Govt. Wenlock Hospital, Mangalore during the period from 1st Jan 1999 to 31st December 2003 were included. A total of 546 cases were admitted due to acute poisoning during the study period. **Results:** Three hundred and eighty (69.6%) males and one hundred and sixty six (30.4%) females were admitted to the hospital due to poisoning. Organophosphates were the most commonly used suicidal poison irrespective of age, sex and occupation of the victim. There were two hundred and thirty five cases of male suicidal poisoning and one hundred and twenty six female cases of suicidal poisoning. Majority of poisoning cases were seen in manual labourers. The increasing trend of poisoning was observed for the period of 1999 to 2003 except for the year of 2003. **Conclusion:** The study highlights about the problem of poisoning in the region. Since the majority of the victims of the poisoning are from low socio economic status. There is economic burden on the family members of the victim of poisoning as the earning member of the family becomes ill (for treatment), dies (loss of earning member) and also emotional setback and disturbance.

Keywords: Poison, Organophosphates, manual labourers, suicide.

Self-harm has often been thought as a problem particular to the industrialized world. Recent work however begins to emphasize its importance in developing world. The global burden of disease study reported that 5, 93000 people killed themselves in the developing world during 1990, 75% of the worldwide deaths from self harm[1,2,3].

A recent study demonstrated that 44% of all deaths amongst 10-50 year old women in Bangladesh were due to poisoning the majority following suicidal ingestion of pesticides[4].

Pesticide poisoning from occupational, accidental and intentional exposure is a major developing world health problem[5]. Millions of people are exposed to danger by hazardous occupational practices and unsafe storage[6]. However it is the deliberate self poisoning that causes the great majority of the deaths and the immense strain the pesticides put on hospital services particularly in Asia[7,8]. In 1990, Jayaratnam estimated that self-harm resulted in 2 million cases each year with 2-lakh deaths[5].

In contrast, accidental and occupational exposures were estimated to cause 1 million cases with 20,000 deaths. Many studies have shown that deliberates self poisoning has far higher mortality than accidental poisoning[9-12].

In developed countries, the rate of mortality from poisoning is 1% to 2% but in India it varies between 15 to 30%[13]. Poisoning is the fourth most common cause of mortality in rural India[14]. The nature of poisoning varies from one region to another depending upon the poison availability and the knowledge of local population regarding poisonous properties. In North India aluminiumphoshide and organophosphate poison are common. Whether aluminiumphoshide or organophosphate these substances are developed to control insects and pests have became major contributors in the causation of poisoning death[15].

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Very few studies have been done in South India regarding the epidemiology of poisoning as compared to North India. So this study has been aimed to determine the various parameters of poisoning such as mode of poisoning, type of poison involved, outcome of poison, the most vulnerable age group, occupation of the victim, marital status and above all to find out the most common type of poison used in South India as compared to North India.

Methodology

A retrospective study in which all the patients of acute poisoning admitted to Government Wenlock Hospital, Mangalore during the period from 1st Jan 1999 to 31st Dec 2003 were included. A total of 546 cases were admitted due to acute poisoning during the study period. The data collected using the proforma was entered in the computer in data base and statistical analysis was done using epi-info statistical package Chi Square test was done and $p<0.05$ was considered significant.

Results

In our study there were 546 cases brought to Govt. Wenlock Hospital in 5 years due to suspected poisoning. In 1999 there were 82 cases of poisoning brought which then increased to 141 cases in the year 2002 which then decreased to 118 cases in 2003 (Fig-1).

Total Number of male patients admitted to hospital due to poisoning was 380 (69.6%) and females were 166 (30.4%) with the male: female ratio being 2.29:1.

Majority (53%) of victims with suspected use of poison were in between 21-40 years followed by the age group between 1-20 years (25%) (Table-1). Most common poison used for suicide purpose by all the victim irrespective of age, sex and occupation were pesticides (Organophosphate and Organochlorines) (Table-2). 13.3% of all the cases of poisoning were due to accidental snakebite with majority implicating viper. There were 12.08% of alcohol poisoning cases either accidental or suicidal with male preponderance (M & F ratio 6.3:1).Of the 235 male cases of suicidal poisoning 74% were married and 26% unmarried. Out of the 126 females who did suicide by consuming poison 61% were married 39% were unmarried (Table-3). Unmarried females were more prone to suicide than married females as compared with male, while unmarried females were in lesser risk for accidental poisoning than married Table-3).

The suicide by poisoning was most common (68%) among the manual labourer for both male (44%) and female (24%), while homicide by poisoning was negligible (0.2 %) only. A significant number (31%) of the manual labourer were suffered due to accidental poisoning and among them males were comparatively more (25%) than females (7%). (Table-4).

In the year 1999, 24% of the cases admitted to hospital due to suspected poisoning expired which then decreased to 8.4% cases in the year 2003 which may be implicated to better availability of the facilities in the hospital. In the 5 year 15.7% of the total poisoning cases admitted to the hospital expired. 19% of the victims of the suicidal poisoning lost their life whereas only 9.8% of the victims of the accidental, poisoning lost their lives. 28% of the cases, which consumed pesticides, expired. 18% of the males who attempted suicide by consuming poison deceased whereas for females this was only 5.02%. 17% of the unmarried persons who tried to commit suicide by consuming poison deceased whereas for the married person this was 12%.

Fig 1: Trends of poisoning

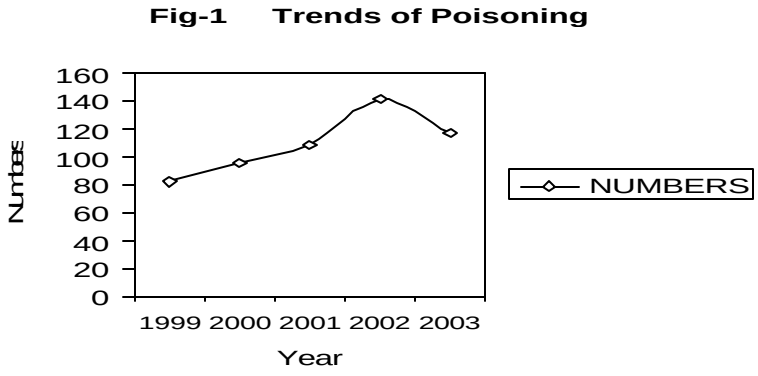

Table 1: Poison's type with age group (n=546)

Poison	Age 1yr-20yrs			21 yrs – 40 yrs			41 yrs – 60 yrs			60yrs and above		
	M	F	T	M	F	T	M	F	T	M	F	T
Pesticide	18	23	41	94	15	109	34	4	38	7	0	7
Medicine	3	15	18	22	15	37	8	0	8	1	0	1
Snake bite	17	3	20	25	5	30	15	6	21	1	1	2
Corrosive	8	11	19	11	8	19	5	3	8	1	1	2
Alcohol	5	2	7	35	3	38	17	3	20	0	1	1
Food poison	2	4	6	7	4	11	0	3	3	0	1	1
Rodenticide	4	7	11	17	11	28	5	2	7	0	0	0
Plant	1	2	3	1	2	3	1	0	1	0	0	0
Kerosene	5	4	9	2	1	3	0	0	0	0	0	0
Others	1	1	2	6	5	11	1	0	1	0	0	0
	$P<0.0098$ $X^2 = 21.7$			$P<0.00019$ $X^2 = 32.0$								

Table 2: Poisoning due to different type of substances

POISON	NUMBER	PERCENTAGE
Pesticides	195	35.7%
Snakebite	73	13.4%
Alcohol	66	12.4%
Drug	64	11.8%
Rodenticides	46	8.5%
Corrosives	32	5.9%
Food poisoning	21	3.9%
Copper sulfate	16	2.3%
Kerosene	12	2.2%
Plant	7	1.3%
Others	14	2.6%
Total	546	100%

Table 3: Mode of poisoning with marital status (n=546)

Mode	Married			Unmarried		
	M	F	T	M	F	T
Suicidal	174	77	2	61	49	110
Accidental	89	28	117	56	11	67
Homicidal	0	1	1	0	0	0
	263	106	369	117	60	177

Table 4: Occupation with mode of poisoning

Mode of Poisoning	Occupation					
	Manual labourer		Beedi roller		Others*	
	M	F	M	F	M	F
Accidental	103	28	4	2	38	9
Homicidal	0	1	0	0	0	0
Suicidal	182	102	15	8	38	16
Total	285	131	19	10	76	25

*Others include transport workers, students, electrician, housewives and whose profession was not known

Discussion

Self-poisoning is one of the ancient way tried for committing / attempting suicide. There are reports from different parts of the world highlighting various substances abused for acute poisoning and their toxicities.

In our study pesticides were the predominantly used poison with 28% mortality associated with them. From western countries drug (sedatives and analgesics) have been reported as the commonest substances abused with mortality rates varying between (0.4% - 2%)[16-19]. Reports available from certain Asian countries (Pakistan and Srilanka) and African countries (Uganda) describe organophosphates crop sprays and drugs as the commonly abused toxic substances with reported mortality rate varying from 2.0% - 2.1%[21-23]. The mortality rate in the India is between 15% - 30%[3]. The morbidity, mortality in any case of acute poisoning depends upon number of factors such as nature of poison dose consumed, level of available medical facilities and time interval between intake of poison and provision of medical help.

Most of the deaths (88.2%) in the present study were cases of self-poisoning. This is comparable to other studies and suggests that suicide by using poisons has gained popularity because of general belief that poison terminates life with minimal suffering[24 - 27].

In our study there is a male predominance (69.6%). A study by Gupta et al showed the similar pattern which followed the studies done at Allahabad, Rohtak, and Srilanka[28 - 31]. The high incidence may be because males are more exposed to stress strain and occupational exposure compared to females. However female predominance was found in Imphal and Maharashtra[32,33].

Severe cases of poisoning are more likely to occur in socioeconomically low class family than medium and high class family. Because the results of the present study showed that the manual labours were more victims than other group. Similar observation was observed by other researchers [34].

In this study the most common age group involved was in the age group between 21-40. A pattern similar to this has been reported else where in India and abroad[25,31,34.]

Agrochemical poisons, particularly organophosphates were responsible for deaths in the majority of cases; but organophosphate compounds are important to sustain crop production. In agricultural country like India, loss of crops due to insects or pests can't be taken lightly, hence instead of banning a particular pesticide , the following measures could be adopted : all chemical should be properly labelled ; storage and sale of insecticide should be controlled through strict legislation and regulation ,and open market sale of this chemical should be banned; a fixed quota as needed per individual should be available through the specialized agency ; and the public should be educated about the hazards of pesticides and their sale and proper handling.

The changing trends of poisoning need to be studied on a regional basis for proper health care policy planning, so as to equip the hospitals/ health care centres in a particular region for early proper diagnosis and effective treatment of such cases.

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