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Research Article

Death due to Poisoning with special reference to insecticide

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Abstract

Insecticide poisoning is a major public health problem in the world, particularly in developing nations, its usage has increased in recent and past thus increased even its misuse to commit suicide. This retrospective study was carried out at department of Forensic Medicine & Toxicology, Al Ameen Medical college, Bijapur, India with the insecticide poisoning cases from the year of 2009 and 2013. .

During this study period a total 5742 Medico legal autopsies were conducted, amongst them poisoning cases constitutes 744 cases, out of these 186 other poisoning cases, 558 cases were due to fatal insecticide poisoning. Males were outnumbered with 340 cases and females were 218 cases. More number of the cases were found in the age group of 21–30 years 164 followed by 31-40 years 136. Most victims were from rural area, married population outnumbering the married. There are 424 victims were from rural area while 134 were from urban area and 446 were married, 112 were unmarried.

Keywords: Suicide, Poison, Death.

Introduction

Insecticides are used in most of the countries around the world to protect agriculture and horticulture crops against damage and even they are also used as domestic pesticide.[1] Poisoning by insecticides is becoming a very serious global problem. As per the available data Insecticide poisoning account for an estimated three million cases of severe poisoning worldwide in each year, with approximately 220,000 deaths. And very interestingly more than 90% of these cases are reported from developing countries, such as India [2,3,]

One of the study from UK reports 1% insecticide poisoning deaths, South Africa reports 9.7%[3], Morocco 4.2%[1], 66% in Iran[3], which various studies from India show figures up to 70% [4,5,6,7,8,9,10]. Even though the poisoning death and deaths in Road

Traffic Accidents are very nearly stands on the same line, great public concern is given to road traffic accidents only, thus poisoning deaths being neglected. For the same, an alarm for early diagnosis, treatment and preventions so also research needs to follow. Reporting of data is crucial in any country. As complete knowledge about the nature and magnitude of in particulars are essential for the physicians in hospital practice. [10]

The aim of the study was to determine the epidemiological profile of fatal insecticide poisoning.

Methods

This retrospective study of all the poisoning, which were subjected to post mortem examination in Bijapur District; examination and analysis done from all the available files of accidents register, diagnosis reports, inquest report, post mortem reports and chemical analysis reports into the fatal insecticide poisoning cases.

The standard proforma to obtain data from the records to ensure consistency for the whole sample. Information collected sample includes Name, age, sex, height, weight, marital status, occupation and place of deceased, place of death, date and time of autopsy, date of chemical analysis, causes of death and manner of death. All the above data was analyzed.

Results

The present study reveals that out of total 5742 medico legal autopsies conducted the total poisoning cases 744. Out of the above poisoning cases there are 558 cases due to insecticide poisoning and 186 cases were oleander and snake bite poisoning.

Table 1. Annual poisoning deaths and insecticide poisoning deaths in comparison with total medico legal autopsies.

Year	Total poisoning cases	Total Oleander & snake bite poisoning	Total insecticide poisoning
Total	744	186	558

Young adults belonging to the age group 21-30 constitutes the majority 164 of victims followed by 31-40, 11-20, 41-50, 51-60, 61-70, 0-10 and 71-80 was observed **(Table-2).**

Table 2. Age and gender wise distribution of insecticide poisoning.

Age group	Male	Female	Total
0-10	10	**12**	22
11-20	30	30	80
21-30	**86**	**78**	**164**
31-40	84	52	136
41-50	52	16	68
51-60	50	06	56
61-70	22	02	24
71-80	06	**02**	08

Below ten years (0-10) of age 22 cases were observed, amongst 6 were the age of within three months, one week female infant was the minimum age of the study. Significant decrease in the high age groups observed. Male outnumbered female, the male and female ratio being 3 : 2.

Table 3. Insecticide poisoning deaths and marital status.

Year	Married		Total	Unmarried		Total
	Male	Female		Male	Female	
2008	132	90	222	30	24	54
2009	158	66	224	26	32	58
Total	**290**	**156**	**446**	**56**	**56**	**112**

Table 4. Total numbers of Brought dead cases and Hospitalized deaths.

Year	Brought dead		Total	Hospitalized death		Total
	Urban	Rural		Urban	Rural	
Total	54	304	**362**	72	124	**196**

Different causes for deliberate consumption constitutes family quarrel, love failures and financial problems, disease like chronic illness, AIDS, mental illness, alcoholism and drug addiction.

Results of chemical analysis revealed that most of the reports were of Organophosphorous compounds and Organochlorinated compounds in general but in some of the chemical analysis repot mentioned that such as Monochrotophos, Quinolphos, Endosulfan, Tik 20, Malathion and Parathion (follidol). All the chemical analysis have done in Regional Forensic Sciences Laboratory, Salem, Tamil Nadu.

Viscera of all the insecticide poisoning cases such as stomach and its contents, intestine, liver, kidney and blood have sent to Regional Forensic Sciences Laboratory(RFSL), Salem, for chemical analysis and reports have received. Out of 558 insecticide poisoning cases, 504 cases were found presence of poisoning in all the visceral organs including brought dead and hospitalized death within 36 -48 hours and 54 cases were admitted in the hospital if the person survived for more than 3 days, chances of detection of poison in viscera and blood reduced to almost 50%[12]. This may be because during the period of survival, the poison is excreted or is completely metabolized to a byproduct that is no longer, so poisoning found limited, decreased level in liver and kidney and absent in stomach, its contents and intestine.

Table 5. Chemical analysis report.

Outcome of the report	No. of cases
Insecticide poisoning detected in all the viscera	504
Insecticide poisoning detected in Liver and Kidney	54
Total	**558**

Discussion

Committing suicide is one of the ancient way of sacrificing their life by consuming different poisonous substances which are easily accessible to them compared to hanging or other methods. The morbidity and mortality in any case of acute poisoning depends upon number of factors such as nature of poison, age, sex of victims and rate of toxicity [14] , presence of medical facilities and time interval between intake of poison and medical attention [7].

In present study out of 5742 medico legal autopsies 744 cases were of fatal poisoning in which 558 cases were due to insecticide poisoning. History and police inquest revealed that 520 cases were of suicidal in nature followed by homicidal 24 and accidental 14 nature, this correlate with Vishal Garg**,** & S.K. Verma [16] suicidal 124 and accidental 66 cases out of 190 cases. Insecticide poisoning is significant in number as they are preferred in most of the suicides because of this rapid action, ready availability and knowledge of lethal potency. Sometimes homicidal deaths occurs when insecticide poisoning mixed with liquors and accidental deaths occur in children.

Maximum number of cases were found in the young adults of age group 21-30 followed by 31-40 years is consistent with other studies Mina Ait El Cadi,et.al.,[1]; Manish Nigam,et.al.,[4]; Vinay B Shetty, et.al.,[8];Vishal Garg[16] ; SK Verma and Dhaval et.al.,[17] & S.M.Kar,et.al.,[18] have observed 21-30 years and followed by 11-20 years. The reasons for this trend may be that young adults are more susceptible to frustrations caused by highly competitive society, failures in exams, love affairs, scolding by parents etc.

The sex incidence affected with fatal insecticide poisoning was more with male which outnumbered females the ratio being 3:2 and tallies with other studies [1,3,5,6,7,8,9,10,11,12,13,15] males outnumbered the female as male are often exposed to stress and strain of day to day life, occupational hazards and easy availability of insecticides. Female cases were due to dowry demands, family quarrels for illicit affairs and failures in love and examn. results. Out of 279 (558) cases, 223 (446) cases were married and 56(112) cases were unmarried.

It was observed in the present study 242 cases were from rural area and 134 cases were from urban area. The maximum insecticide poisoning in rural area because of large family size, ignorance, easily availability of agricultural poisoning, lack of education and awareness[7,16,17]. Early marriages in rural community, social customs, limited resources, poverty may lead to married male to consume insecticides than unmarried population. This findings were also similar with findings of previous studies [5,6,7,8,9,10,11,12,15].

Chemical analysis report revealed Parathion (Follidol), Monochrotophos, Endosulfan, Diazinon (Tik20) and Quinolphos are outnumbering offending agents. This trend however varies with the area concerned and easy availability. These studies have been carried out in Chennai, Pune and Mumbai showed Parathion(Follidol) and Tik20(Diazinon), study in Aurangabad revealed Monocil, Thimate, and Endosulfan, in decreasing frequency. In 54 cases were chemical analysis reports were shown that presence of poisoning in certain viscera are very limited. It was observed that generally after 3-4 days of hospitalization chemical analysis was found that the poisoning in the viscera narrowing about 50%[12]. This may be due to the poison being completely metabolized to by products that is no longer demonsratable during analysis when the person survives more than 4 days period[12].

In the present study 362 cases were brought dead and 196 hospitalized death and death rate is high in numbers particularly in rural area 308. This finding is consistent with BD Gupta, PC Vaghela, Manoj Kumar etal., Vaibhav Sonar. Most of the victims found dead at their farm houses and unnoticed for long time. This may be due to distance between place of incidence and hospitals,

strong desire to commit suicide, improper referral from Primary Health Centres without treatment giving reason of inadequate antidotes and other facilities and lack of awareness.

Conclusions

Out of total 5742 medico legal autopsies conducted, poisoning cases constitutes 744 cases, out of these 558 cases were due to fatal insecticide poisoning. Insecticides were used maximum to commit suicide, consisting 520 victims. Male outnumbered female with male, female ratio being 3:2, the highest incidence being in the age group of 21-30 years. Peak period of deaths by poisoning more in nos. in the month of May & June, reason behind that examinations results have declared during these period. Most victims were from rural area, married population outnumbering the married. Considering the chemical analysis most common offending agents were, Parathion (Follidol), Monochrotophos, Endosulfan, Diazenon (Tik20) and Quinolphos. Insecticide poisoning is a major public health problem in developing countries; its usage has increased in recent and past thus increase misuse to commit suicide.

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