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CLINICO EPIDEMIOLOGIC PROFILE OF POISONING IN A TERTIARY CARE CENTRE

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ABSTRACT
Poisoning is a major health challenge in our country. Our objective is to study the clinic epidemiological profile of poisoning in a tertiary care hospital. A total of 420 cases admitted with alleged consumption of a poison were included in the study. The prevalence pattern in relation to age, gender, occupation were studied. The study also analysed the time of interval between consumption and arrival, duration of hospital stay and outcome of patients. the study showed a male preponderance. The prevalence was more in the age group between 21 and 30 years. The most common cause was due to organophosphorus compound consumption followed by pyrethroids and tablets consumption 38.8% were farmers and 29.52% were housewives. The major reason for deliberate self harm was acute stress reaction followed by depression. The mortality rate was 14.04% in our study. 63% cases arrived to the hospital within 4 hsours of poison consumption. The mortality rate was high when patient arrives later than 8 hours of poison consumption (32.55%). Mortality rate was similar while comparing the duration of hospital stay. Paraquat and celphos poisoning had 100% mortality followed by organophosphorus poisoning(28.38%). Upto 24% had substance abuse. The study highlights the prevalence of various poisonings and the pattern of mortality Rates, for better management of poisoning cases, reinforcing pesticide regulations and counselling programs to decrease the incidence of poisoning.

KEYWORDS: Organophosphorus, Paraquat and celphos.

INTRODUCTION
Poison is any substance that produces toxic effects to the human body even drug overdose will be treated as poison.[1] Poisoning occurs when people drink, eat, breathe, inject or touch enough of a hazardous substance to cause illness death. Illness may occur very quickly after exposure to a poison or it may occur over time period.[2] Deliberate self harm refers to an intentional act of causing physical injury to oneself without wanting to die.[3] Most commonly include cutting hand with knife, scratching or hitting oneself and intentional drug overdose. Many individuals who self harm use more than one method of self injury.

AIMS AND OBJECTIVES
The aim of the study was to know the pattern and profile of poisoning at a tertiary care hospital in Tirunelveli, south Tamil Nadu. The study also aims to study the age and gender distribution in poisoning cases, prevalence in relation to occupation, substance abuse and reason for consumption. The study also analysed the time interval between poison consumption and arrival to hospital and the mortality rates.

MATERIALS AND METHODS
The study was a retrospective cross sectional conducted at Tirunelveli Medical College Hospital. The data over 6 months from June 2017 to Dec 2017 was collected for the study. A total of 420 cases of poisoning admitted in the intensive medical care unit were studied during this period. Data regarding type of poison consumed, time between consumption and presentation, treatment and outcome data were studied. Food poisoning, drug reaction, snake bite, stings were excluded from study.

RESULTS

Table 1: Age wise Distribution of Cases.

S. No	Age group in years	Male[n=250][%]	Female[170][%]	Total%
1	13-20	41 [16.4]	55 [32.35]	96 (24.37)
2	21-30	81 [32.4]	63 [37.05]	144 (34.3)
3	31-40	54 [21.6]	20 [11.764]	74 (16.68)
4	41-50	39 [15.6]	17 [10]	56 (12.8)
5	51-60	28 [11.2]	9 [5.294]	37 (8.24)
6	>60	7 [2.8]	6 [3.52]	13 (3.16)

Table 2: Pattern of various poisons.

S.No	Type of poison	Male No.(%)	Female No.(%)	Total No.(%)
1.	Organophosphorus compound	93[37.5]	42[24.70]	155[31.1]
2.	Hairdye	14[5.6]	15[8.87]	29(7.23)
3.	Tablet	28[11.2]	30[17.64]	58(14.42)
4.	Oleander seeds	15[6]	6[3.52]	21(4.76)
5.	Phenol & Household	6[2.4]	12[7.05]	18(4.725)
6.	Pyrethroids including Mosquito repellant	42[16.8]	21[12.3]	63[14.5]
7.	Ratkiller	7[2.8]	6[3.52]	13(3.155)
8.	Ant killer	15[6]	22[12.94]	15(9.47)
9.	Kerosene	12[4.8]	2[1.176]	14(2.98)
10.	Others	18[13.2]	15[12.35]	33(12.775)

Table 3: Occupation wise to Distribution of cases.

S.No	Occupation	No. of cases [%]
1.	Farmer	163[38.80]
2.	Student	56[13.334]
3.	Housewives	124[29.52]
4.	Self employed	20[4.761]
5.	Elderly	57[13.57]

Table 4: Reasons for Poison consumption.

S.No	Reason for consumption	No. of cases [%]
1.	Acute Stress Reaction	227[54.04]
2.	Depression	116[27.61]
3.	Accidental	12[2.8]
4.	Known Psychiatric illness	35[8.3]
5.	Quarrel	30[7.14]

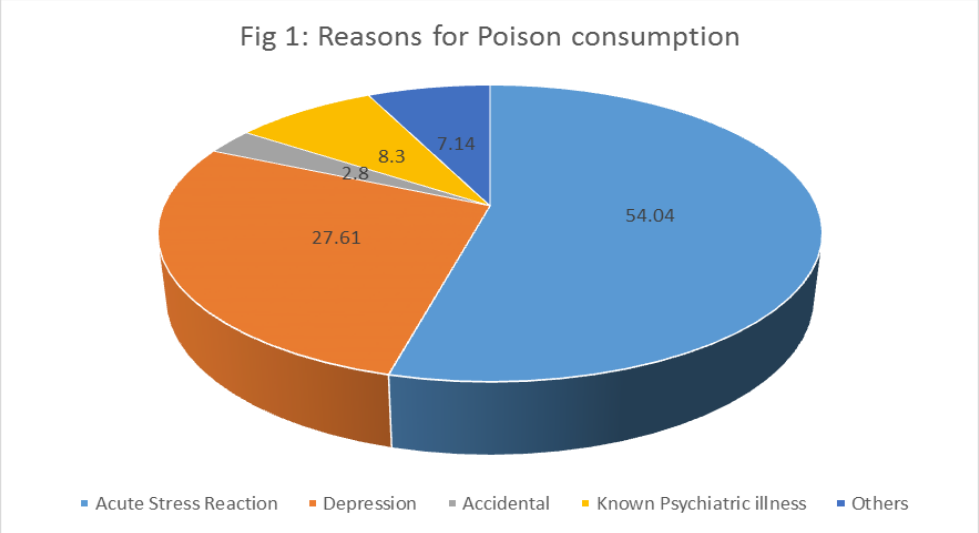

Table 4b:outcome.

S.No	Outcome	No. of cases
1	Recovery	361[85.88]
2	Death	59[14.04]

Table 5: Time interval and outcome of poisoning.

s.no	Time interval from consumption to admission	Death and percentage	Mortality rate	Recovery and percentage	Total
1	<4 hours	25[42.3]	9.43%	240[57.1]	265[63.09]
2	4 to 8 hours	20[33.8]	17.85%	92[21.9]	112[26.7]
3	>8 hours	14[23.7]	32.55%	29[6.9]	43[10.23]

Table 6: Patient's hospital stay duration.

s.no	No. of days at hospital	No. of cases [%]	Mortality rate % (n)
1	<7 Days	312 [74.28]	14.42% (45)
2	8-14 days	92 [21.90]	13.04% (12)
3	>14 days	16 [3.80]	12.5% (2)

Table 7: Comparison of outcome in various poison consumption.

S.No	Type of poison	No. Of death[%]	No of Recovery[%]	Mortality rate	Total
1.	Organophosphorus	44[74.5]	111[26.4]	28.38%	155
2.	Paraquat	7[11]	0	100%	7
3.	Aluminium phosphide	3[4.6]	0	100%	3
4.	Rat killer	2[3.4]	11[2.6]	15.38%	13
5.	Oleander seeds	1[1.7]	20[4.7]	4.76%	21
6	Hair dye	1[1.7]	28[7.75]	1.72%	29
7	Tablet(benzodiazepine)	1[1.7]	57 [15.8]	3.45%	58

Table 8: Pattern of relationship with substance abuse.

S.NO	Substance abuse	No. Of cases
1	Alcohol Abuse	94[22.38]
2	Cocaine / Heroin	8[1.90]

RESULTS

In our study the males (59.5%) outnumbered females. Maximum number of cases were in the age group of 21-30 years. In this age group females (37.05%) were more predominant than males(32.4) [Table 1]. Less cases were seen in geriatric age group > 60 years of which there 7% were males and 6%were females.

Among the type of poisoning, common poisons were Organophosphorus compound (37.5%)., pyrethroids (14.5%), tablet poisoning (14.42%) and ant killer (9.47%). 33 other poisons were 7 cases of paraquat,12 cases of natural fertilizers, 2 cases of neem oil, 5 cases of paint thinner, 3 cases each of celphos and lice killer and 1 case of root of Gloriosa superba. [Table 2]. Among the 58 cases of tablet poisoning, common drugs were as following: benzodiazepines (n=20), antipsychotics (n=15), antihypertensive drugs (n=12), oral hypoglycaemic agents (n=7), hematinics, vitamin supplements and paracetamol (n=4).

38.8% cases were farmers, 29.5% were housewives and students constituted 13.3%. [Table 3]. The incidence among farmers is due to agriculture failure.

Analysing the reason for consumption of poisoning most of the patients were found to consume poison due to acute stress reaction (54.04%) followed by depression (27.6%) and previous psychiatric illness (8.3%) [Table 4].

Mortality rate was 14.04% [The time interval between consumption of poisoning and admission to hospital in 63% cases was within 4 hours. Only 10.2% cases were admitted after 8 hours of poison consumption. Earlier admissions showed good prognosis and outcome. The mortality rate was very high in those who arrived later than 8 hours (32.55%) [Table 5]. This finding was found to be significant ($p = 0.04$).

74.2% the patients in the study had a shorter stay in the hospital less than 7 days. This could be due to lesser amount of poison consumption and faster recovery. Mortality rates were similar irrespective of the duration of hospital stay [Table 6]. Mortality rate was high in organo phosphorus compound ($p<0.001$) and paraquat ($p<0.05$). Common poison that resulted in death include organo phosphorus compound, paraquat, celphos, rat killer, oleander seeds and hair dye poisoning. All the 7

cases of paraquat poisoning and all the 3 cases of celphos poisoning expired.

When considering the associated factors, it is found that 22% cases also had the habit of consumption of alcohol. And about 1.9% also addicted to other substances like cocaine, heroin. [Table 8].

DISCUSSION

A total of 420 patients were registered in IMCU with history of poisoning in study This high incidence of poisoning can be credited to the easy availability of poison in India and prevailing is that mortality due to poisoning is with very less suffering compared to other means This study shows a high male preponderance. Similar observation was found in other studies.[4,5,6] Female predominance is seen in 21 to 30 years of age group due to stress, family burden and domestic violence in the Indian Society. Studies by Bajracharya et al and Paudyal et al[7,8] showed female preponderance.

The majority of the patients (46.68%) in this study were less than 30 years of age, which is comparable to study by Fernando.[9] The highest number of poisoning patients observed in young adults was also noted in other studies.[10,11] The high number of poisoning patients in young adults can be attributed to increased peer pressure, competitiveness, stress, failure to fulfil expectations from family, failure in examinations at school, love affairs, stress. The majority of the suicidal poisoning was observed in married patients, mostly females, which is comparable to studies by Basu and Agarval in India.[12,13] More number of patients in this study were married for 3 to 7 years, followed by marital life less than 3 years. This can be due to abuse, marriage related issues, dowry related issues, extramarital affairs, divorce, impotence or infertility issues, unemployment or other family problems.[14]

38.8% of the patients were farmers, followed by housewives and students. Singh et al study observed housewives accounted for the greatest number of the poisoning patients, followed by farmers, shopkeepers, and labourers. Moreover, maximum number of patients in this study had access to the poison either at their homes, or bought their poison from a pharmacy or a shop next to their home, or at their farms.[10] Farmers' suicide can be attributed to debt, agricultural failure which is similar to a study conducted in Maharashtra by Anita Paritekar.[15]

In most cases, the intent for poisoning was suicidal in our study. Only 2.8% cases were accidental poisoning, which is comparable to study by Kondle.[9] On psychiatric assessment of all poisoning patients, the reason for ingestion of poison in 54.4% cases was due to acute stress reaction, 27.65% were due to depression. Family issues, failure in examinations, financial problems and psychiatric illness are important causes of poison consumption. The psychiatric assessments in this study were comparable to findings in a study by Agarval.[13]

The common type and classes of poisons consumed in a study by Sharma included pesticides, tablet overdose, rodenticides and insecticides, corrosive agents, petroleum products, plant poison and heavy metals. In the study by Sharma among these poisons, unspecified pesticides were consumed by a maximum number of patients, followed by organophosphate and carbamate insecticide poison, benzodiazepine tablet overdose, rodenticides, acetaminophen tablet overdose and petroleum products. A significant number of patients did present with Oleander seed poison.[16] Other studies also found pesticides like organophosphates to be the predominant cause of poisoning.[12,16] As farming is the major occupation, pesticides like organophosphate and carbamate poisons are abundantly and readily available in local shops in South India, making it a favourable agent for suicidal poisoning. A retrospective study by Das at A.I.I.M.S, benzodiazepines poisoning is the commonest cause of poisoning, which is contrast to our findings.[17] This result is probably due to the fact that New Delhi is a metro city and agro pesticides are not widely accessible.

The mortality rate is 14.04% in our study. The most common causes of death include organophosphate and carbamate insecticide poisoning, paraquat, celphos, rat killer, oleander seeds and benzodiazepine poisoning. The mortality rate in organophosphorus poisoning is high which can be due to the late presentation to the hospital and respiratory failure. whereas paraquat and celphos are fatal even at low dose. In this study, the fatality rate was similar compared to other studies by Singh S and Sharma BK.[16,17] It is also observed from the study that paraquat poisoning was found to be 100% fatal.[19] In our study, 85% of the patients were discharged from the hospital within first week of hospitalization. 1.67% cases were discharged after seven days of admission, due to poison related complications or comorbid illness. Time interval and outcome of our study is comparable to the study by Ramesha et al.[20]

CONCLUSION

We are able to demonstrate the epidemiological profile of poisoning patients registered in the IMCU department, along with the common poisons used, duration of hospital stay and mortality rates of various poisons. Common household items like rodenticides, insecticides, mosquito repellent, bathroom cleaners, and kerosene, which are commonly used as poisons should be clearly labelled, locked and safely stored at homes to prevent accidental poisoning among adults. Legislation and guidelines restricting sales of pesticides to those without farm lands should be strictly implemented to prevent non-farmers from having access to these chemicals. Similarly, sales of benzodiazepines, antihistamines and other sedatives must be regulated through strict enforcement of providing them only on presentation of a

valid prescription from a licensed medical practitioner. This will decrease poisoning due to restricted access to these drugs. A long term strategy that will include more far reaching results is one that involves a two-step verification process by pharmacies licensed to provide restricted medication. A program where they can contact the doctor's office/clinic or verify the authenticity of the prescription would be ideal.

Community awareness programmes, and campaigns, poison control centres and suicide help lines, targeted towards the youth, especially women, can help to significantly reduce the incidence of poisoning.

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