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A STUDY ON PHARMACIST INTERVENTION, MANAGEMENT, PRESCRIPTION PATTERN IN POISONING CASES REPORTED AT TERTIARY CARE HOSPITAL

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ABSTRACT

Ingestion of poison take into the body is called poisoning. Poison a substance that damages your cells and organs and injures your health. Poisonings comprises an important health issue and leading cause of hospital admission and mortalities in developing countries. This study aims to evaluate the pharmacist intervention, prescription pattern and death incidence in poisoning cases reported at tertiary care center. Participants comprised of poisoning admissions to medical intensive care unit of in **SVS hospital & Government hospital** during 6 months of period. Data regarding pattern of poisoning basic demographic prescriptions patterns and death incidence were collected by retrospective study. Majority of poisoning cases were observed in the age group between 21-30 years (41.11%), 61.11% reported cases were of females and 64.44% were illiterate patient. Parameters related to drug utilization exhibited slight variations with the agent consumed. Mortality rate was less possibility due to timely medical management and death incidence was of 2.22%. Prevailing treatment protocols require updating on proper guidelines for better management of poisoning. The patient counseling was provided to the interventional group of 30 patients and non-interventional group of 30 patients were also maintained from the 60 accidental cases reported. In the duration of the

study it was found that the counseling was significantly effective in avoiding the repoisoning. Thus there is need for pesticide regulation laws and counseling and training programs to reduce incidence care.

KEYWORDS: poisoning death incidence, OP, pesticide, medical intensive care.

INTRODUCTION

Ingestion of poison take into the body is called poisoning. Poison a substance that damages your cells and organs and injures your health. A route of poisoning varies. They may be swallowed, inhaled, splashed into the eyes or skin and can be injected into the body as in case of snake bite, scorpion string etc.

There are lots of different poisonous substances, including medications, household products (such as cleaning products) and some plants and berries.

General Symptoms of Poisoning Can Include: Nausea,Vomiting,Diarrhea,Stomach pain, Drowsiness, dizziness or weakness, Fever, Chills (shivering),Loss of appetite, Headache or irritability, Difficulty in swallowing, Producing more saliva than normal, Skin rashes, Burns around the nose or mouth, Double or blurred vision, Seizures (fits) and Coma (in severe cases).

Signs and symptoms of organophosphate poisoning can be divided into three broad categories: (1) Muscarinic effects, (2) Nicotinic effects and (3) Central Nervous System (CNS) effects[1]

Mechanism of Action of Organophosphorus Poisoning

Organophosphorus compounds contain carbon and phosphorous acid derivatives that are well absorbed through the skin, lungs, and gastrointestinal tract. They bind to red blood cell (RBC) acetylcholinesterase (AChE) and render this enzyme nonfunctional leading to an overabundance of acetylcholine at the neuronal synapses and the neuromuscular junction. In addition, plasma cholinesterase (butyryl cholinesterase [BuChE] or pseudo cholinesterase [PsCE]) and neuropathy target, esterases are also inhibited, but clinical significance of these interactions is uncertain. A conformational change in the compound renders the enzyme irreversibly resistant to reactivation by an antidotal oxime, and this is known as “aging.”The use of OP compounds has declined in the last 10-20 years, in part due to the development of

carbamate insecticides, which are associated with similar toxicities but slightly different mechanism of action.[2]

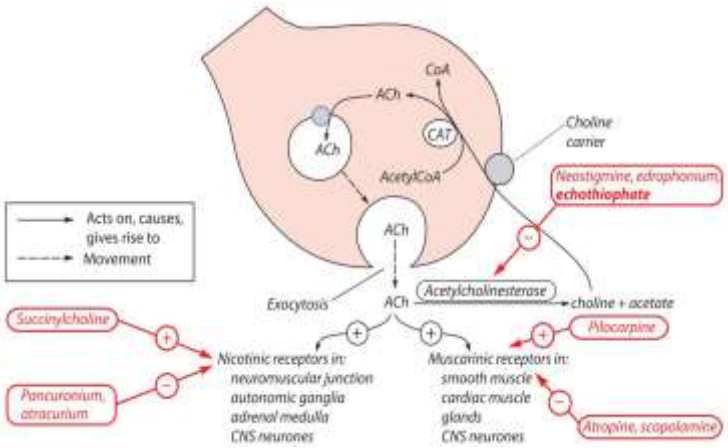


Fig:- Simple figure of cholinergic transmission with potential sites of drug action

Treatment of OP poisoning

Atropine: 2-5 mg IV bolus (0.05 mg/kg IV in children). Escalate (double) dose every 3-5 minutes until bronchial secretions and wheezing stop.[3]

Pralidoxime: Oxime therapy is recommended in patients with evidence of cholinergic toxicity in patients with Organophosphorus poisoning. PAM is not recommended for poisoning due to carbamate (reversible inhibitor of acetyl cholinesterase) poisoning. The standard recommended dose of PAM is 2 g (25 – 50 mg/kg in children) IV over 30 minutes, with continue infusion at 8 mg/kg/hour in adults (10 – 20 mg/kg/hour in children).[4]

Oxygen and ventilator support: Deliver 100 percent oxygen via facemask; strongly consider intubation in moderate to severe poisoning. In addition, patients who appear mildly poisoned may rapidly develop respiratory failure due to combination of CNS respiratory centre depression; nicotinic receptor mediated diaphragmatic weakness, bronchospasm, and copious secretions.[5]

Benzodiazepine therapy: Diazepam 0.1 – 0.2 mg/kg/ IV, can be given, repeated as necessary, if seizures occur. The early use of diazepam may reduce morbidity and mortality.[1,6]

Decontamination: In case of topical exposure with potential dermal absorption, aggressive decontamination with complete removal of the patient's clothes and vigorous irrigation of the affected areas should be performed. The patient's clothes and belongings should be discarded

since they absorb Organophosphorus agents, and re exposure may occur even after washing.[2]

Gastric lavage and activated charcoal: Emptying the stomach by gastric lavage is most useful if attempted within 1 to 2 hours after ingestion of a potentially life threatening amount of poison.[7]

Fluid and electrolyte balance and other supportive measures: Patients may require extra fluids and electrolytes to compensate for loss due to vomiting, diarrhea, high fever and for decreased intake. Thus, apart for the daily minimum requirement of fluids (e.g. about 2 liters), sodium and potassium, IV fluids may have to be given for extra-fluid and electrolyte replacement.[8]

Toxicological Effects.[8,9,10]

Hepatological Disorders: Congestion, Centrilobular Necrosis, Fatty Changes, Alcoholic Hepatitis and Sinusoidal Dilatation.[9]

Neurological Disorders: Neuronal Necrosis, Neuropsychological Dysfunction And A Cerebella Syndrome.

Renal Impairment: Renal failure

Effects on The CNS: impaired memory, vigilance, reduced information processing, psychomotor speed, memory deficit, linguistic disturbances, depression, anxiety and irritability.

REVIEW OF LITRETURE

1. Rehiman S et al 2008[11]: In his studying was to correlate between the clinical score described by Peradenya Organophosphorus Poisoning (POP) scale, serum cholinesterase level at presentation and severity of poisoning. A total of fifty consecutive patients of OP poisoning, among them 62% were female. The age of the patients ranged from 15 to 70 years with 70% of them between 15 to 25 years. Among the 15 to 25 year-old patients, the number of females was twice that of males. Above the age of 25 years, the number of males was relatively more than that of females. House wives and students were the most common group of patients in our study (28% and 22% respectively), followed by laborers (16%), farmers (14%) unemployed (14%) businessmen (4%) and shopkeepers (2%). A total of 68% of the

patients had consumed parathion methyl and 26% dichlorovos. The longest hospital stay was of a female patient who had consumed parathion and was in hospital for 26 days (POP scale 8).

2. Kale Bhagwat 2014.[12]: They studied the Intensive care management of organophosphate insecticide poisoning. A retrospective study was performed on the patients with OP poisoning followed at our medical intensive care unit. Forty-seven patients were included. Diagnosis was performed from the history taken either from the patient or from the patient's relatives regarding the agent involved in the exposure. Intravenous atropine and pralidoxime was administered as soon as possible. Pralidoxime could not be given to 16 patients, 2 patients did not receive pralidoxime because they were late admissions, and 14 did not receive pralidoxime because the Ministry of Health office was out of stock. Data are presented as mean ± standard deviation. There were 25 female and 22 male patients. Thirty-two (68%) were suicide attempts and 15 (32%) were accidental exposure patients. The mortality rates for the patients who did and did not receive pralidoxime were 32 and 18.7%, respectively and were not statistically different. Ten patients (21.2%) required mechanical ventilation. The mortality rate for the patients who required mechanical ventilation was 50%, but the rate was 21.6% for those patients who were not mechanically ventilated. Intermediate syndrome was been observed in 9 (19.1%) patients. Complications were observed in 35 (74.4%) patients. The duration of the intensive care stay was 5.2 ± 3.0 days.

3. Shashank Tripathi 2014.[13]: This was a prospective cross sectional study conducted at tertiary care centre, Nagpur from October 2011 to September 2013 after taking permission from ethical committee. There were 70 patients of op compound poisoning admitted to the department of medicine during the study period. After applying inclusion and exclusion criteria, 40 patients who fulfilled all criteria were chosen as study subjects. In the present study of 40 patients results were as follows: Majority, i.e. 13 (32.5%) of patients were in the age range of 21-30 years, followed by 12 (30%) patients in the age range of 31-40 years. Most of the patients were males [29 (72.5%)], while 11 (27.5%) were females. 19 (47.5%) patients included in the study had agriculture as the main occupation, while 10 (25%) cases were females and housewives.34 of the patients i.e. 85% consumed poison with suicidal intent. Total mortality was 17.5% in the present study. The association between the cholinesterase levels with the outcome was statistically significant with P-value of 0.0001 as obtained using Chi-square test. Those with normal cholinesterase levels showed significantly

higher chances of survival as compared to those with less than 10% of the normal cholinesterase levels. There was also significant association between POP scale (p value <0.0001).

4. Merry raphael *et al* 2015[14]: In his study on Evaluation of incidence, clinical characteristics and management in Organophophrous poisoning over 100 patients found. There were 68 male and 32 female patients and the male/female ratio was 2.1:1. The most frequently affected age group was 21-30 years in both sexes (40%). Out of 100 patients 60% were married. Residency distribution patterns showed that 64.5% of the patients came from rural areas, while 35.5% were from urban areas. The estimated mean pre-hospitalization period after the exposure was 2.5 ± 2.1 h (Min: 1 h, Max: 12 h). These were recorded using standardized data collection forms and were analyzed with SPSS version 17.The average approximate volume of OPCs consumed was 48.9 ± 52.5 ml. The approximate volume of OPCs consumed obtained either from patient or patient party. Oral ingestion (98%) was found to be the most common route of poisoning. But, the most frequent reason for poisoning was attempted suicide (98%). All the 100 patients received gastric lavage at initial stage of therapy. Only 30 patients received activated charcoal every 6th hourly for 1-2 days.

5. Shah Harsh D et al 2012.[15]: In his study on Organophosphate (OP) insecticides inhibit both acetyl cholinesterase and pseudocholinesterase activities. A cross sectional descriptive study was done on fifty patients, by simple random sampling technique who came to emergency ward of Hospital, Jamnagar. After setting inclusion and exclusion criteria, Pre tested perform was filled up. Analysis was done with primary information, clinical admission POP score, pseudo cholinesterase, hospital stay, atropinization requirements, need of ventilator support and mortality. Intravenous atropine and pralidoxime was administered as soon as possible. The diagnosis was performed from the history taken from the patient or the patient's relatives after taking consent. Amongst fifty patients, 78% were male and 22% were females. Mean age of the studied patients was 28 ± 10 years. In the study, inhalational poisoning (54%) had common occurrences than ingestion poisoning (46%) but mortality (6%) was found higher with ingestion. The compound that was exposed most commonly is monochrotophos (60%). Association of POP score came significant at $p < 0.05$ with above mentions factors. OP insecticide poisoning is a serious condition that requires rapid diagnosis and treatment. The patients with evidence of moderate and severe degrees of poisoning need

close monitoring, as respiratory failure is the prime cause. Early management protocol will help to reduce mortality of poisoning.

MATERIALS AND METHODS.[11,12]:

A prospective interventional study was conducted over a period of 6 months in Inpatients of general medicine and emergency Department at SVS medical college and hospital, district government hospital, Mahabubnagar. The data collection form will be prepared and used. It mainly includes patient demographic details, BP, blood sugar levels, serum cholinesterase levels of the patient and details of patient medication chart.

RESULTS

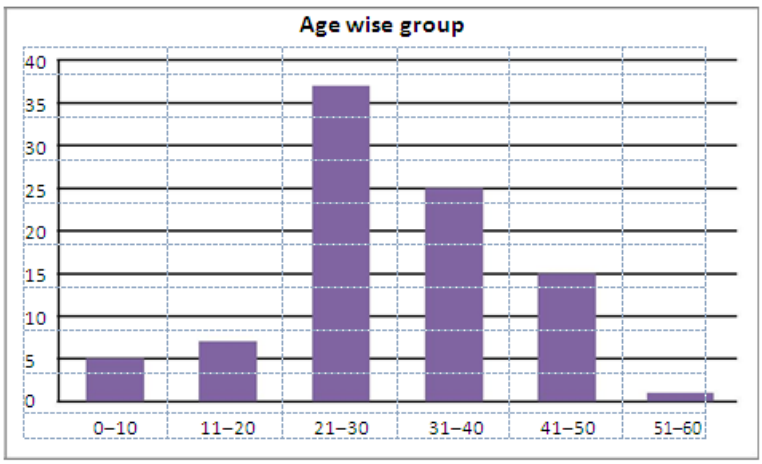


Figure 1: Age wise distribution of cases

The age wise distribution of poisoning cases were differentiated and the most cases were reported from the age group of 21-30 years followed by 31-40 years, 41-50yrs, 11-20yrs, 0-10yrs and 51-60yrs respectively. It shows that age group of 21-30 yrs. are more to OP in Mahabubnagar rural area.

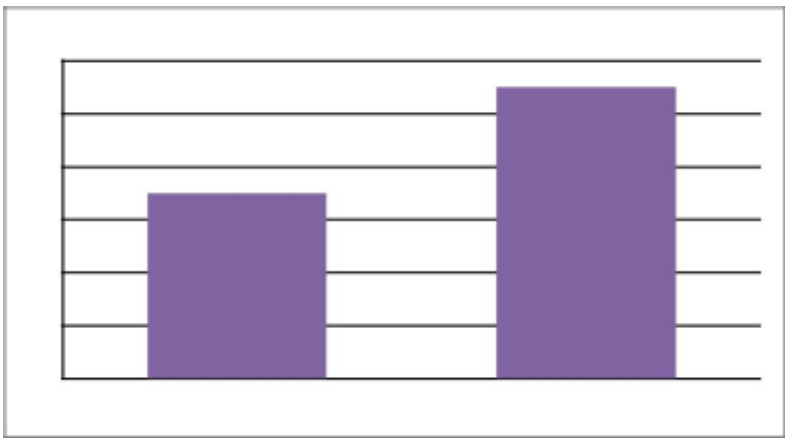


Figure 2: Gender Wise distribution of cases

When the OP poisoning cases were classified it was found that more of the females (55 out of 90 cases) in the rural area were reported with OP poisoning compared to male of just (35 out of 90).

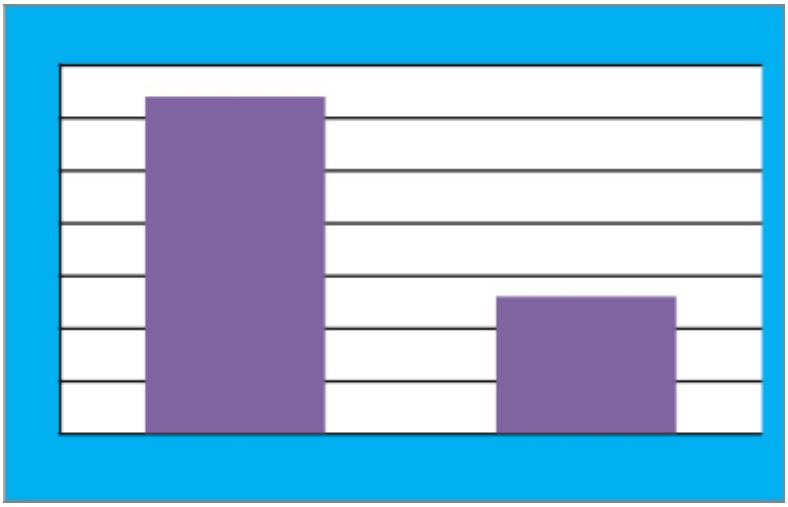


Figure 3: Martial status of the Cases

When the OP poisoning cases were distributed according to the martial status we have found that married patients (64 out of 90) are more, than the unmarried patients (26 out of 90).

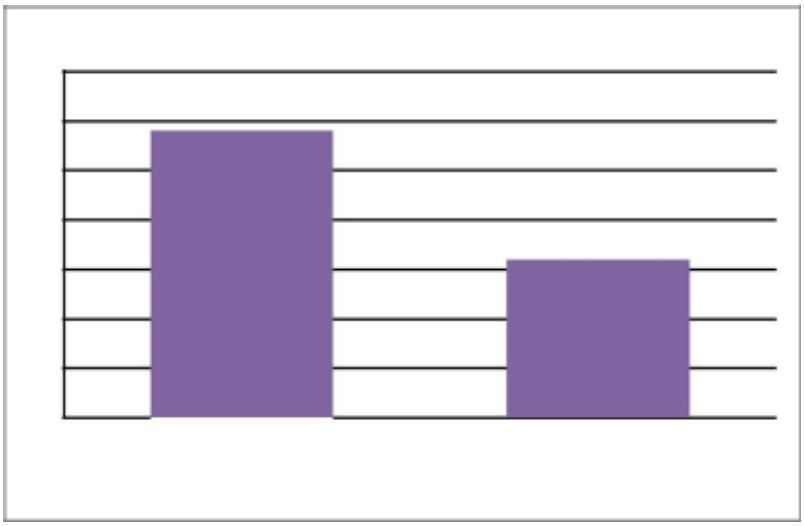


Figure 4: Literacy rate among Cases

When op poisoning cases were differentiated according to educational status, we have observed that illiterates (58 cases out of 90) are consuming more poison than the patients who have primary and secondary level of education (32 out of 90).

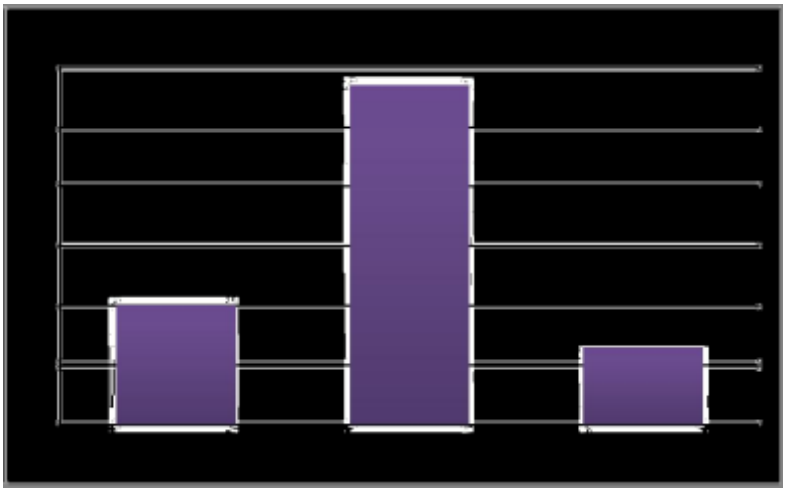


Figure 5: Severity of Poisoning

All cases were distributed according to the severity of poisoning (i.e. mild, moderate, severe) the moderate level of poisoning is more (57 out of 90), followed by mild (20 out of 90) and severe (13 out of 90).

Figure 6: OP Poisoning Severity Score

Scoring has been given by pop scale (Perdyina Organophophrous poisoning scale),and 32 cases has got score 4 ,recorded as moderate and 20 cases has got score 5 that comes under moderate,13 cases has got score 15 that under comes severity ,and 1 case has got score 2 that under comes mild .

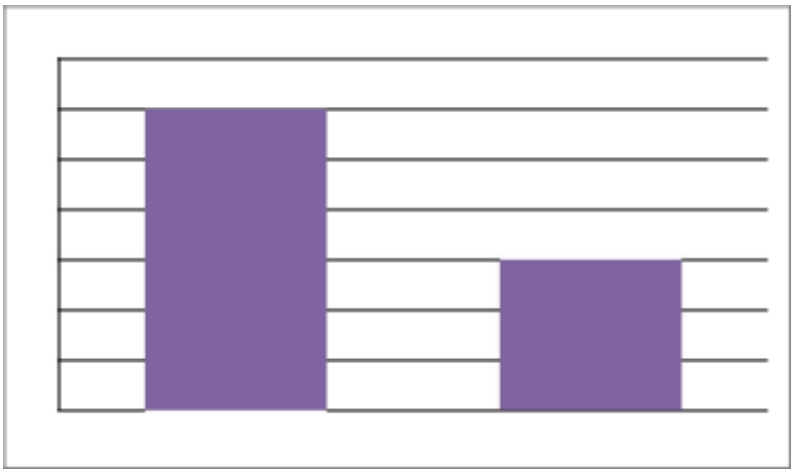


Figure 7: Type of Poison Cases

As per the collected 90 cases at Mahabubnagar during study, in those 60 cases accidental and 30 cases are suicidal poisoning.

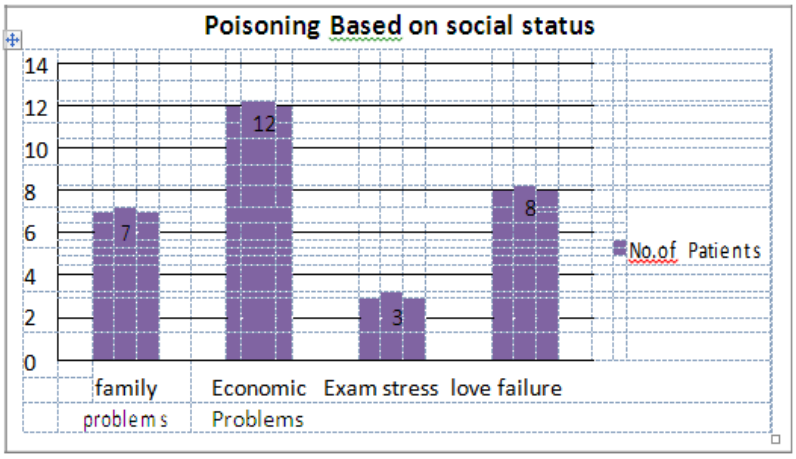


Figure 8 Poisoning based on social status

In the present study we have categorized the suicidal poisoning patients based on social status as follows family problems (7 cases), economic problem (12 cases), exam stress (3 cases), and love failure (8 cases)

Figure 9: No. Of Prescriptions with Antidote &Gastric lavage

No. Of prescriptions with antidote and gastric lavage were divided, according to our study 45 cases were gone through the gastric lavage, where 43 cases were treated with atropinization, and 38 patients have been treated with inj. PAM were 20 cases were treated with Pralidoxime.

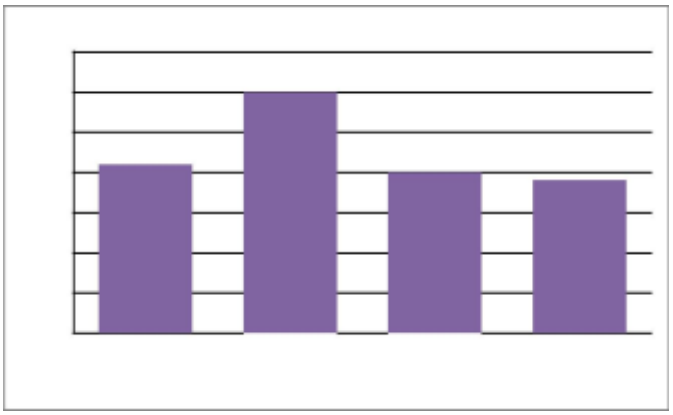


Figure 10: No. Of Prescriptions with IVF & Vitamin Supplements

No. Of prescription with IVF and vitamin supplements were divided and we found that 20 cases were administered with RL, followed by NS 25, INJ.OPTINEURON 23, and DNS 22.

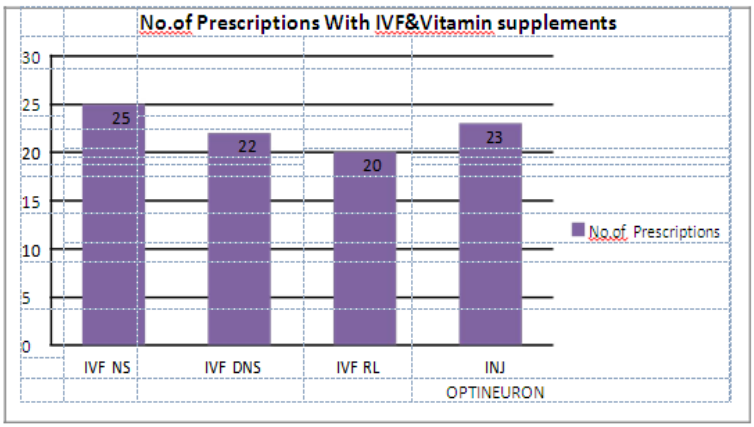


Figure 11: No. Of Prescriptions with Anti Pyretic &Analgesics

No. Of prescription with antipyretic and analgesics were divided and this study shows that 20 patients were treats with tramadol,20 patients were treated with **CHYMORAL FORTE**,14 cases **with DOLO** and 36 cases were treated with **PCM**.

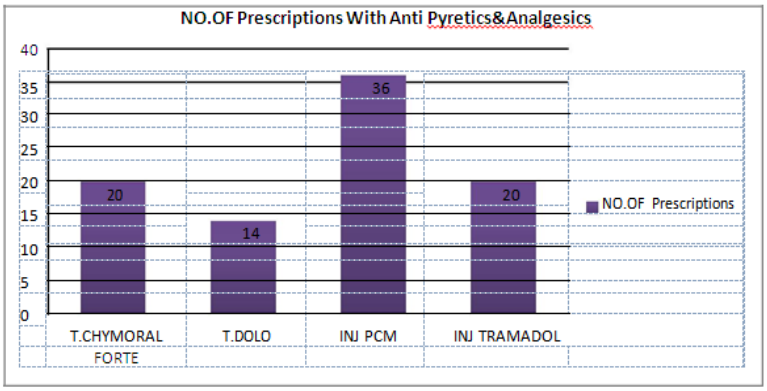
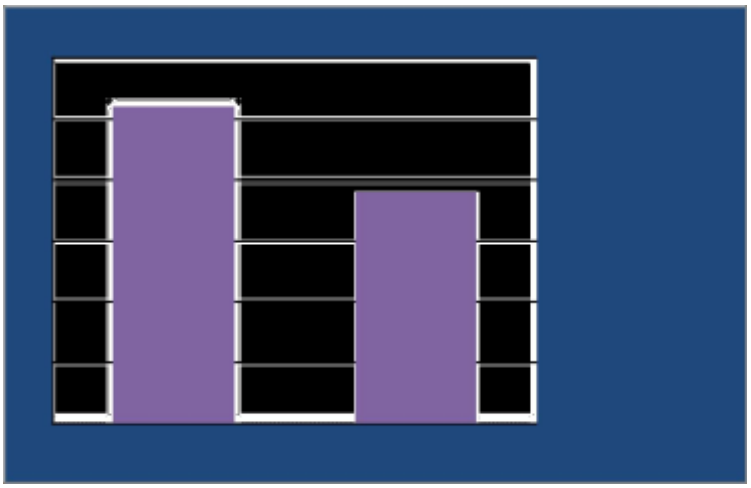


Figure 12: No. Of Prescriptions with Anti Emetics &PPI



No. Of prescriptions with Anti Emetics &PPI were divided, according to our study 52 cases were treated with **ZOFER (Anti Emetics)**, where 38 cases were treated with **PAN (PPI).**

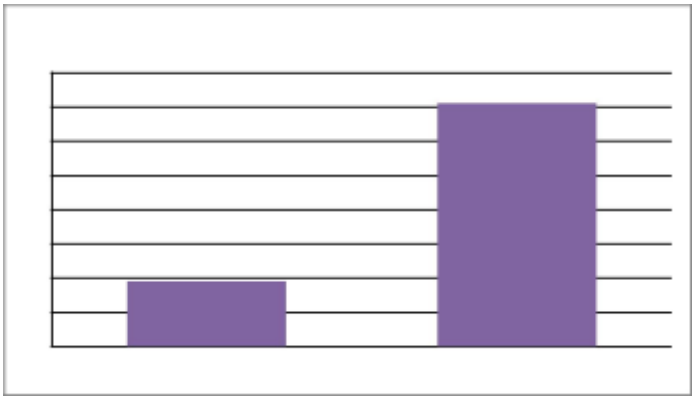


Figure 13: No of Prescription with Antiulcers&H_2 receptor antagonist

No. Of prescriptions with Antiulcers&H_2 receptor antagonist were divided, according to our study 19 cases were treated with SYP SUCRALFATE, where 71 cases were treated with INJ RANTAC

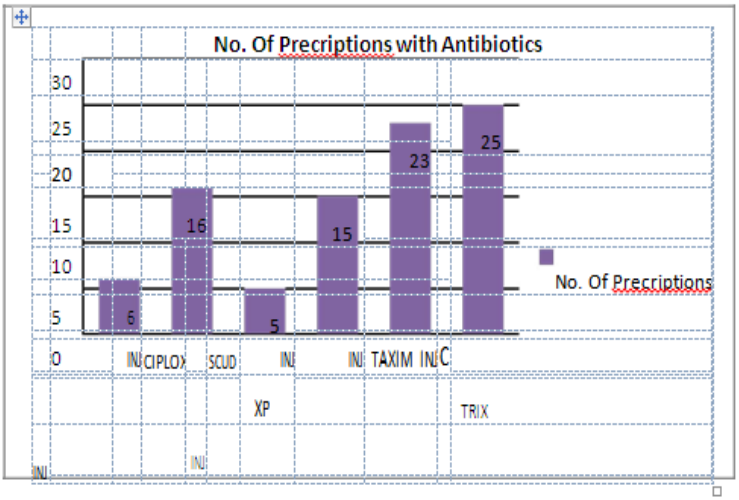


Figure 14: No. Of Prescriptions with Antibiotics

Prescription wise distribution of drugs has been done and in antibiotics 25 cases were prescribed by the INJ.C-TRIX, followed by INJ TAXIM, INJ XONE, INJ.CIPLOX, AMIKACIN AND INJ.SCUD XP.

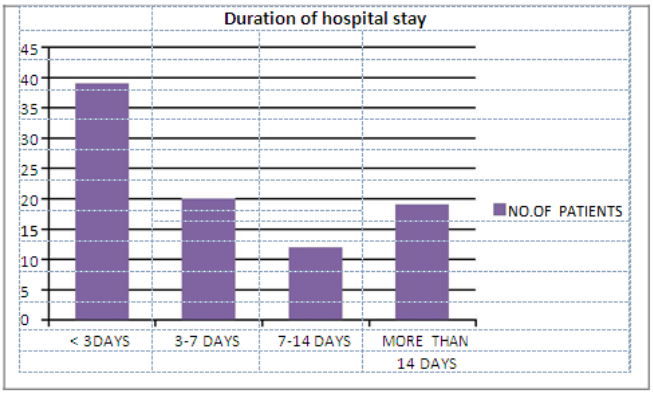


Figure 15: No. Of prescriptions with duration of therapy

In the present study we have categorized the poisoning out of 90 patients based on duration of hospital stay follows as less than three days(39 patients),3-7 days(20 patients),7-14 days (12 patients) and more than 14 days(19 patients).

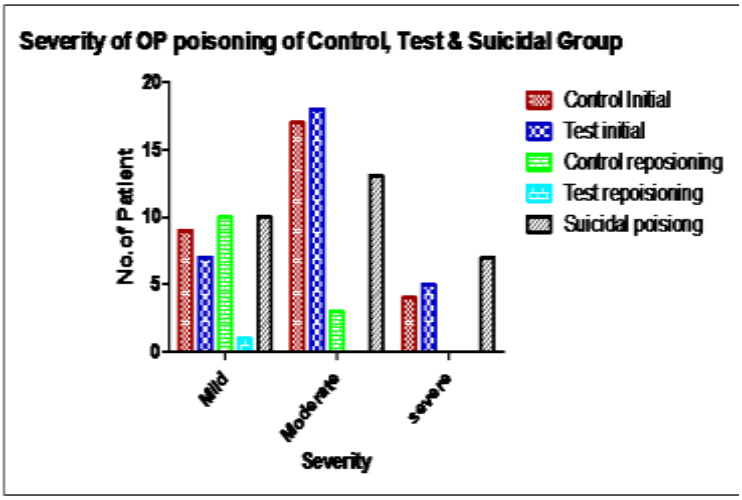


Figure 16: Severity of OP poisoning of control, test &suicidal group

Severity of OP poisoning of Control, Test & Suicidal Group

The severity of OP poisoning was measured by using POP scale and it was found that the initial control &initial that group contain almost same no. of patients under mild, moderate & severity ranking without significant change .their was a significant change in mild, moderate &severity rankings of poisoning when control initial &re-poisoning control &re-poisoning test were compared were 0.001% P value significant decreases was found in case of test re-poisoning.

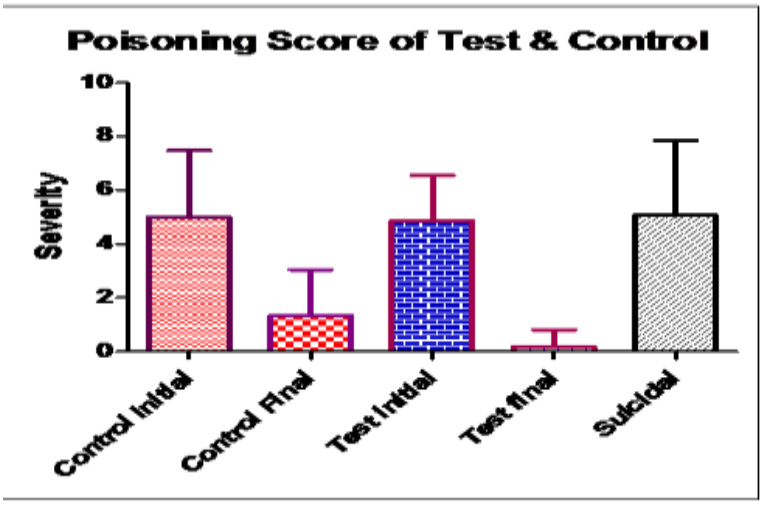


Figure 17: Severity of OP poisoning of control, test &suicidal group

The Severity and re-poisoning cases reported were subjected to one way ANOVA by Dunnattes comparative test and the significant decrease was observed in the test re-poising cases when compared to control initial and control re-poisoning group, there was no significant change in control and test initial poising. The significance level of $P<0.001$ was considered, which shows that the patient counseling and poising awareness given was effective.

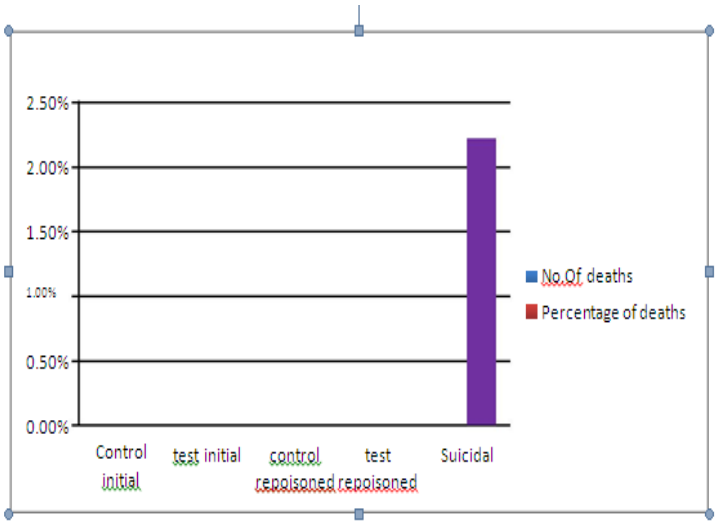


Figure 18: Death incidence

The death incidence during the study was 2 in the group of intentional poisoning which accounts to be 2.22% of the poisoned populations.

DISCUSSIONS

Zakhie et al has categorised the victims of OP poisoning based on age as follows below 15 years (14%), 16-25 years (50%), 26-35 years (24%), 36-45 yrs (5%), above 45 years (7%). In

the present study OP poisoning patients were categorised based on age as follows 0-10 years (5.56%), 11-20 years (7.78%), 21-30 years (41.11%), 31-40 years (27.78%), 41-50 years(16.67%), 51-60 years(1.11%).

Subreath biswas et al has reported the use of atropine & Pralidoxime in 181 patients of OP poisoning 41.33%patient were treated with atropine where as 34.66% of patient were prescribed at Pralidoxime & 83.33%of atropinized patient were shown positive response without any supportive medications. The use of antidote in OP Poisoning cases are atropine& Pralidoxime in 90 cases in with atropine is used in 30 patient & Pralidoxime is used in 21 patient and combination of atropine & Pralidoxime is used in 19 patients & 33.33%atropinized patient were shown positive response without any supportive medication during the study.

During this study it was observed that antibiotics were prescribed more than other class of drugs. In that out of 90 prescriptions 25 were with Tazobactum, 23 were with TAXIM and less no. of prescriptions with Scud XP are given in intravenous route only.

Out of 90 prescriptions ,30 prescriptions were contain atropine as an antidote, followed by PAM i.e. 21,gastric lavage i.e. 20 and least no. of prescription i.e. 19 contain combination of PAM+ATROPINE.

No. of prescriptions with IVF & vitamin supplements were followed by IVF NS were mostly prescribed i.e,25 cases out of 90 when compared to other formulations.

Out 90 of prescriptions, 36were contain INJ PCM, 20 were with tramadol, 20 were with chymoral forte, and least no. of prescription i.e., 14 was with dolo650.

Followed by anti emetics + PPI were prescribed in 90 patients .in that INJ PAN was less prescribed when compared with zofer.

CONCLUSION

A total of 90 patients were enrolled in this study, 30 cases were of intentional poisoning and 60 were of accidental poisoning, which were divided into two equal groups namely control and test. Control group was not given counselling and test group was counselled.

The severity of poisoning in both groups was same initially without any significant change and significant reduction in repoisoning of test group is absorbed when compared with the control repoisoning indicating lack of proper knowledge of using the pesticides. By providing effecting counselling there is significant decrease poisoning inpatients in the test group and the P value was found to be highly significant i.e. <0.001.

The results from the study suggest that the awareness in the common people and farmers about the handling of pesticides and OP agents is necessary and further study is also required to establish the effective antidote usage, a proper prescription pattern in the management of OP poisoning.

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