International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

Pattern, Severity and Outcome of Poisoning in Tertiary Care Hospital

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Abstract: ***Background: The aim is to study the demographic details, clinical presentation, type, pattern, severity, treatment and outcome of poisoning at a tertiary care hospital to evaluate the survival and mortality rate. Methods: A prospective observational study of 6 months duration (September 2017-February 2018) was conducted at emergency department. Patient case sheets were reviewed and relevant information's were obtained by interviewing them. Results: Demographic obtained on 104 patients with acute poisoning that maximum were in the age group of 21–30years, least found in between 1-10 years, about (62.5%)males were exposed than female (37.5%).Organophosphates were the common type of poison consumed and its clinical presentation includes Muscarinic, Nicotinic and CNS 26 (25%). The patterns of poisoning observed were self/intentionally (74%) poisoned followed by unintentional ones. From the severity scale, 61 (58.1%) cases were found moderate, 30 (28.8%) were severe and 10 (9.6%) mild. Frequently prescribed antidotes were injection atropine & injection pralidoxime (33.3%).The clinical outcome obtained was, 96% were survived, and 4% were died. Conclusion: Pesticide compounds and tablet consumption were the common type of poisons. Early treatment of poisoning or snakes bites along with educational and awareness programs is effective in reducing duration of hospitalization and possibly mortality.***

Keywords: Poisoning, poison severity score, organophosphates, gender, therapeutic outcome

1. Introduction

Poison can be referred as a substance which brings on harm and results in death when it is into the body of any living creature (T36-T50 International Statistical Classification of Diseases and Related Health Problems–10th Revision (ICD-10)[1].Poisoning is monumental threat to the public health in India. However the rate of poisoning is not exactly measured[2].Poisoning and snakebites constitute foremost reason in hospitalization and mortality in residential as well as mounting nations[1].The World Health Organization (WHO) guardedly estimates that concerning three million cases of poisoning occur each year and concerning a pair of 20, 000 deaths occur due to poisoning. Of those ninety nine fatal poisoning happens in developing countries significantly among agricultural workers[3].

The common patterns of poisoning are self- destructive, homicidal/criminal and accidental. The reasons mostly expressed for the massive variety of self-harm deaths relates to poverty, unmet expectations, chronic malady states, business loss, love failure or variations seen with the intimate partner, examination or emotional disturbances[4].

Due to widespread use and simple accessibility, nowadays pesticide poisoning (organosulphate) are commonly seen worldwide. Datura and cannabis are the typically encountered Plant poisoning, especially in semi urban and rural areas.Due to adulterated liquor consumption and methanol poisoning may leads to chronic and acute alcohol intoxification[2].Snakebite is also a serious case of which, Over five million venomous bites occur once a year, and nearly, 125, 000 death[5]. PSS (poison severity score) is a simple tool, which can be used for better treatment assessment[6]. Availability of standard treatment protocols, educational programs for rural people may prove more effective for better management as well as for positive outcome[7].The awareness regarding the nature and severity of poisoning may reduce the mortality and morbidity rate[8].Reporting the poison cases and its cost in an hospital or as poison data centre, across the world will help to manage further poisoning and also economically too[9].The main aim of this study is to analyze demographic details along with clinical presentation, severity, outcome of poison cases admitted, type of poisoning cases and its treatment pattern in a tertiary care teaching hospital.

2. Materials and Methods

This prospective, empirical study was conducted when obtaining approval from Institutional commission. Study was initiated within the medicine department/casualty of tertiary care hospital. The patients were followed up in ICU/medicine ward. The Study was meted out from Sept 2017- feb2018. The patients who were brought dead or died straight away upon arrival before receiving any indoor treatment were excluded. Information assortment kind designed by medicine department of the institute was used for the study that comprised of demographic details of the patient, mode of poisoning (accidental/ suicidal/ homicidal), type, indoor treatment, antidote given, outcome etc. A homogenous scale for grading the severity of poisoning permits qualitative analysis of Morbidity caused by poisoning. Poison Severity Score was used as a tool for the study.

3. Results

Table 1: Demographic Details of the Patients.

Age Group	Frequency	Percentage (%)
1-10	0	0%
11-20	10	9.6%
21-30	36	34.6%
31-40	22	21.2%
41-50	14	13.5%
51-60	13	12.5%
61-70	5	4.8%
71-80	2	1.9%

81-90	2	1.9%
Gender Distribution		
Female	39	37.5%
Male	65	62.5%

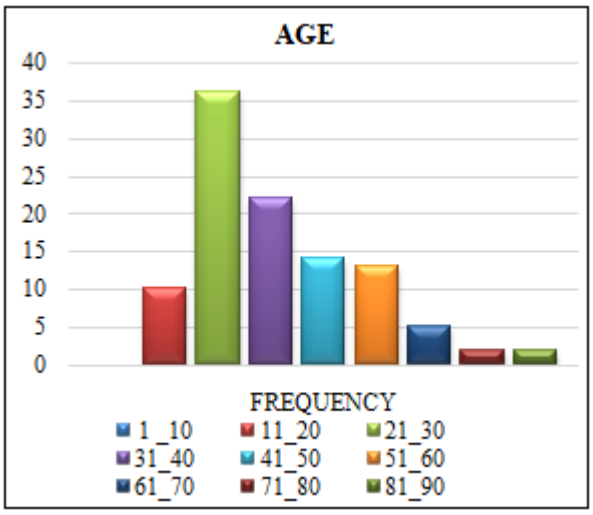

Figure 1: Distribution of Patient Based on Age

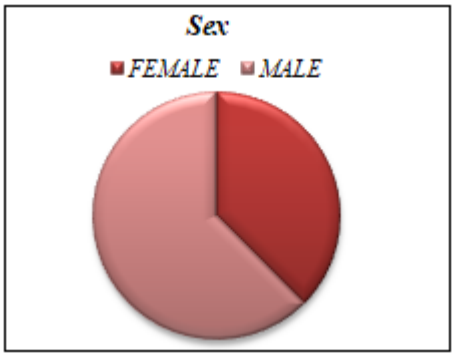

Figure 2: Distribution of Patient based on Gender

Table no: 1 and Fig no: 1&2 shows the distribution of patient based on age and gender. A total of 104 in patients with poisoning cases were included during the study period, Out of which, 65 (62.5%) were males and 39 (37.5%) females. Majority of the subjects came under the age group of 21-30 i.e., 36 subjects (34.6%), followed by the age group were 31-40 i.e., 22 subjects (21.2)

Table 2: Clinical Presentation of Poison Cases

Clinical Presentation	Frequency	Percent
Hemoptysis, Difficulty In Breathing, Weakness, Lethargy, Vomiting	3	2.9
Increased fatigue, Decreased alertness, Impaired performance, Decreased verbal fluency (Alcohol intoxification)	3	2.9
itching, redness of skin, swelling of the skin and around the eyes (Honeybee Sting)	10	9.6
Itching, Sore Skin, Pain, Vomiting (Antiseptic)	1	1
Muscarinic Symptoms (Op Poisoning)	8	7.7
Muscarinic Symptoms+Nicotinic Symptoms (Op Poisoning)	2	1.9
Muscarinic+Cns Symptoms (Op Poisoning)	9	8.7
Muscarinic+Nicotinic+Cns Symptoms (Op Poisoning)	4	3.8
Neurotoxic Symptoms (Cobra)	8	7.7
Nicotinic Symptoms (Op Poisoning)	2	1.9
Nicotinic+Cns Symptoms (Op Poisoning)	1	1
Pyrethroid Poisoning Ingestion	12	11.5
Pyrethroid Poisoning Inhalation+Eye Contact+ Ingestion	1	1
Pyrethroid Poisoning Inhalation+Ingestion	5	4.8
Swelling, Redness, Pain (Scorpion Bite)	2	1.9
Vasculotoxic Symptoms (Viper)	6	5.8
Vomiting, Diarrhea, Abdominal pain (Plant Growth Nutrient)	7	6.7
Vomiting, Loose Stools (Unknown Compound)	5	4.8
Vomiting, Loose stools, Unconsciousness (Herbicide)	2	1.9
Vomiting, Nausea, Abdominal Pain, Diarrhoea (Tablet Consumption)	10	9.6
Vomiting, Unconsiousness, Loose Stools (Fungicide)	3	2.9
Total	104	100

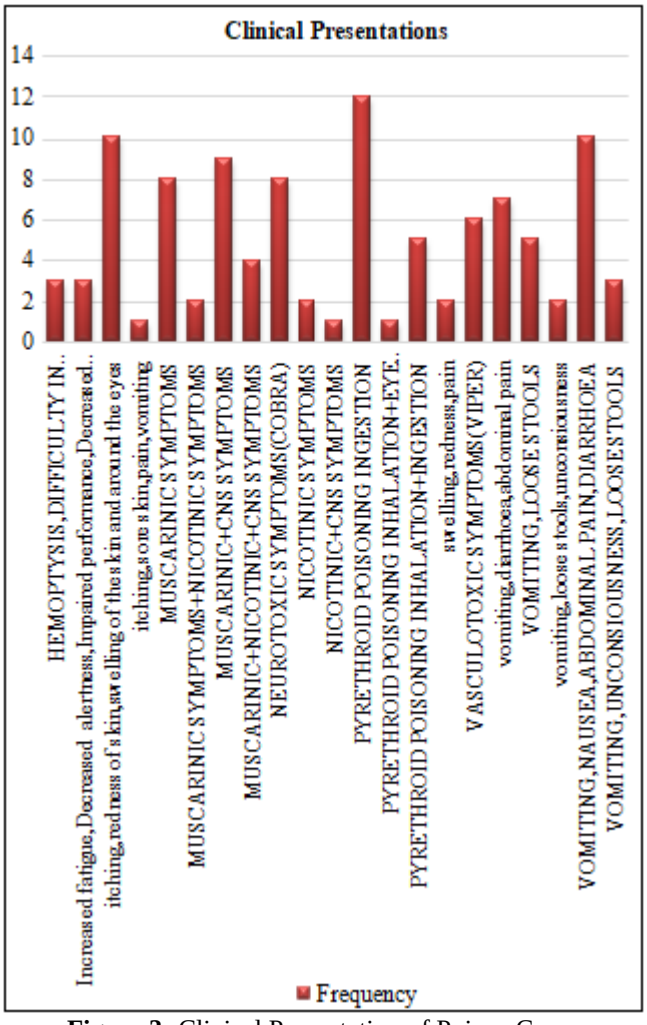

Figure 3: Clinical Presentation of Poison Cases

Table no.7& figure no.8 shows that out of 104 cases, majority of poisoning cases were OP Poisoning and its clinical presentation which includes Muscarinic, Nicotinic and CNS 26 (25%) are the most common symptoms. followed by Pyrethroid Poisoning 18 (17.3%) symptoms like nausea, vomiting, seizures followed by honeybee sting clinical features like swelling, redness of skin and tablet consumption symptoms like nausea, vomiting, abdominal

pain 10 (9.6%) followed by neurotoxic symptoms like necrosis in the region of bite, vertigo, hyper salivation followed by vasculotoxic symptoms like bleeding, swelling, haemetemisis

Table 3: Different Types of Poison Consumed

Types of poisoning	Frequency	Percentage
Alcohol Intoxification	3	2.9
Antiseptic Poisoning	1	1.0
Cobra Bite	8	7.7
Fungicide Poisoning	3	2.9
Goodnight Liquid Consumption	2	1.9
Herbicide Poisoning	2	1.9
Hit Spray Consumption	1	1.0
Honeybee Sting	10	9.6
OP Poisoning	26	25
Plant Nutrient Growth Consumption	7	6.7
Pyrethroid Consumption	15	14.4
Rodenticide Poisoning	3	2.9
Scorpion Bite	2	1.9
Tablet Consumption	10	9.6
Unknown Compound	4	3.8
Viper Bite	6	5.8
Total	104	100.0

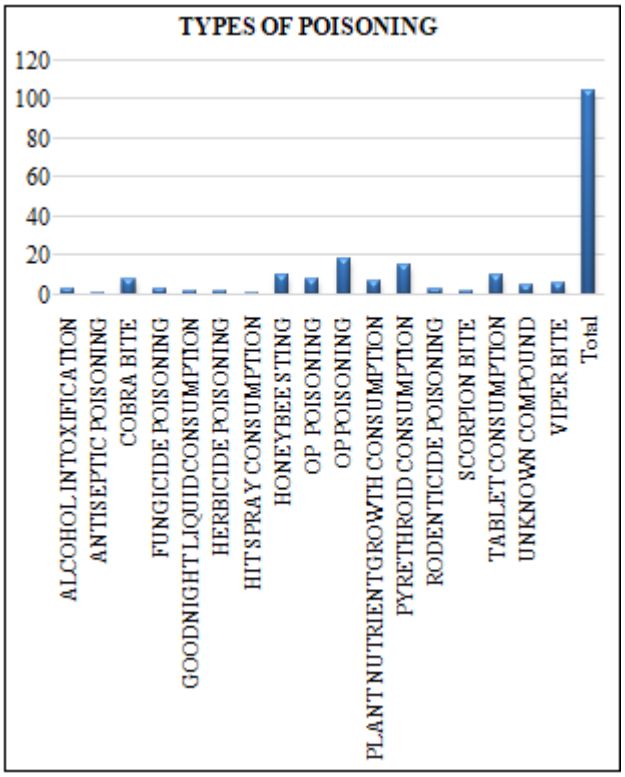

Figure 4: Different Types Of Poisoned Consumed

Table no.6& figure no.7 shows the different types of poisons consumed by patient. Among 104 patients, majority of subjects were consumed OP compound 26 (25%) which mainly includes glyphosphates, dimethoate (roger), profenofos, followed by Pyrethroid compound 15 (14.4%) which mainly includes deltamethrin, cyhalothrin, cypermethrin, followed by Honeybee Sting and Tablet Consumption 10 (9.6%) which mainly includes atenolol, paracetamol, amythriptilline, analgesics.

Table 4: Pattern of Poisoning

Pattern of poisoning	Frequency	Percent
Intentional Poisoning	77	74
Unintentional Poisoning	27	26
Total	104	100

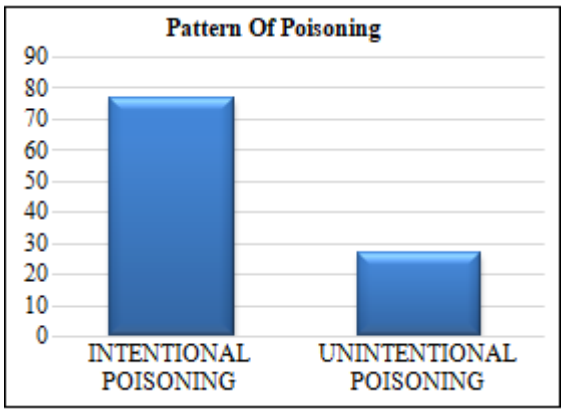

Figure 5: Distribution of Patients Based on Pattern Of Poisoning

Table no: 4 & Figure no: 5 shows the distribution of pattern of poisoning of patients. Out of 104 cases, majority are intentionally poisoned 77 (74%) and 27 (26%) are unintentionally poisoned.

Table 5: Poison Severity Score

Poison Severity Score	Frequency	Percent
None	1	1
Fatal	2	1.9
Mild	10	9.6
Moderate	61	58.1
Severe	30	28.8
Total	104	100

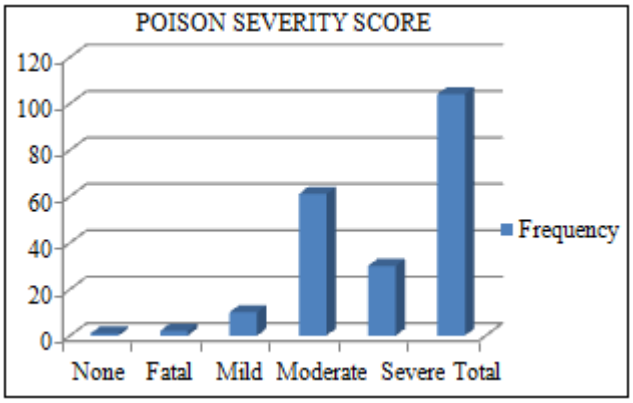

Figure 6: Poison Severity Score

Table no.8 & Figure no.9 shows the poison severity score of different types of poisoning of patients. Poison severity score can be categorized according to the severity of the poison. It includes None (0), Mild (1), Moderate (2), Severe (3), and Fatal (4).Out of 104 cases, 61 (58.1%) cases are moderate followed by 30 (28.8%) cases are severe and 10 (9.6%) cases are mild.

Table 6: Antidote Used

Antidote Used	Frequency	Percent
Inj.n-Acetylcysteine	1	0.9
Inj.Asv	11	10.47
Inj.Asv, Inj.Atropine	1	0.9
Inj.Asv, Inj.Neostigmine	1	0.9
Inj.Atropine	23	21.9
Inj.Atropine, Inj.Pralidoxime	35	33.3
Inj.Atropine, n-Acetylcysteine	1	0.9
Inj.Pralidoxime	1	0.9
Inj.Calcium Gluconate	2	1.9
No Antidotes Used	28	27.6
Total	104	100

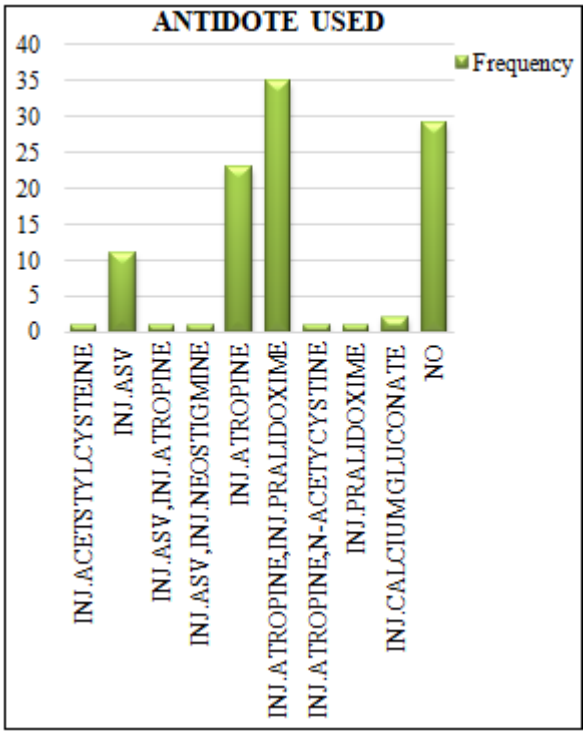

Figure 7: Antidote Used

Table no.12 & Figure no.13 shows the antidote prescribed for the poisoning cases. Among this Antidotes, Inj.Atropine and Inj.Pralidoxime are prescribed in majority of patients 35 (33.3%) and in 28 (27.6%) patients, no antidotes are given. 23 (21.9%) patients received Inj.Atropine, followed by Anti Snake Venom11 (10.47%).

Table 7: Outcome of Patient

Outcome Of Patient	Frequency	Percent
Survived	100	96.15
Died	4	3.84
Total	104	100

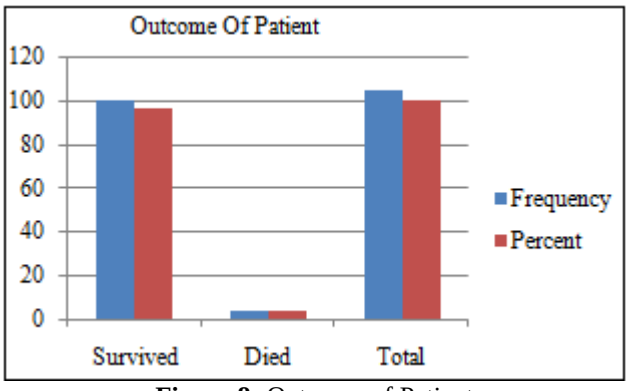

Figure 8: Outcome of Patient

Table no.7& figure no.8shows that out of 104 patients, 96 (92.3%) patients were survived, followed by 4 (3.84%) were died.

4. Discussion

Demographic Characteristics Of Poisoning Cases

In our study, male population were more 65 (62.5%) compared to females 39 (37.5%).This maybe because of males are more often exposed to the stress and strain in day to day life, as well as to the occupational hazards than the females. The similar finding was observed in the study conducted by that Rafiuddin.M et al showed that male predominant was more i.e., 60.5% compared to females 29.5%.

Majority of poisoning cases in our study belonged to age group 21-30 (34.6) years. From this study it is clearly showed that this age group are more exposed to stressful life in terms of job, marriage, financial issues, quarrel with family and other settlement factors. This findings are similar to a study conducted by Maheswari E et al., that showed that age group of 21-30 years (45.5%) were more predominant for poisoning[2].

Pattern Of Poisoning

The pattern of poisoning observed in our study was more with intentional i.e. 74% followed by accidental (26 %.)A similar study conducted by Gopinathan v et al., showed that a greater proportion of poisoning was with intentional i.e. 74.3% and accidental poisoning was 14.83%.[4] The various major reason for intentional poisoning was quarrel with the family members, financial crisis followed by depression. The incidence of intentional poisoning is rising day by day because of social, emotional and professional stress.

Different Types Of Poison Consumed

In our study, organophosphorous (25%) are the most commonly used agents for poisoning, followed by prytheroid (14.4%), honey bee sting and tablet consumption (9.6%), cobra bite (7.7%). A similar study conducted by Rafiuddin M et al showed that organophosphate compounds contributed (29.1%) poisoning cases. As majority of victims of poisoning are farmers, they consumed op compounds more as compared to other agents. This is because of easy availability of op compounds like parathion, malathion, etc.

Clinical Presentation Of Poison Cases

The present study showed various clinical presentations of different types of poison cases. As majority of poisoning

cases were OP and its clinical presentation which includes Muscarinic, Nicotinic and CNS 26 (25%) followed by Pyrethroid Poisoning 18 (17.3%), Honeybee sting and Tablet consumption 10 (9.6%), neurotoxic symptoms 8 (7.7%), vasculotoxic symptoms 6 (5.8%).

Clinical features of OP poisoning

Muscarinic symptoms	Wheezing, dyspnoea, vomiting, diarrhoea, abdominal cramps, increased salivation, lacrimation, sweating, bradycardia, hypotension, miosis, urinary incontinence.
Nicotinic symptoms	Weakness, hypertension, tachycardia, paralysis.
CNS symptoms	Headache, tremor, drowsiness, slurred speech, ataxia, convulsion.

Clinical features of Pyrethroid poisoning

Skin contact	Dermatitis, blistering
Eye contact	Irritation
Inhalation	Rhinorrhoea, sore throat, wheezing, dyspnoea
Ingestion	Nausea, vomiting, vertigo, hyperthermia, seizures

Clinical features of snakebite

Neurotoxic symptoms (cobra bite)	Drowsiness, vomiting, frothy saliva, respiratory failure, paralysis, hyper salivation, necrosis in the region of bite, blurred vision
Vasculotoxic symptoms (viper)	Bleeding, swelling, neprotoxicity, haematemesis, necrosis, blistering, thrombocytopenia

A similar study was conducted by Peter J V et al showed that muscarinic symptoms and signs were the most frequent (84%) followed by CNS (78%) and nicotinic (17%)

Poison severity score (PSS)

The present study analyzed that the severity of poisoning using PSS showed that, 9.6% of the cases were classified as mild, 58.1% were classified as moderate, 28.8% were severe and 1% were classified as none (not showing any symptoms). A similar study conducted Maheswari E et al., showed that 52.6% of the cases were classified as minor, 20% were classified as moderate and 27.3% were classified as none (not showing any symptoms)[2].

Organ	None (0)	Minor (1)	Moderate (2)	Severe (3)	Fatal (4)
	No symptoms	Mild, transient, spontaneously resolving symptoms or signs	Prolonged symptoms or signs	Severe or life threatening symptoms or signs	Death
GI-tract		Vomiting, diarrhea, pain	Prolonged vomiting, diarrhea	Massive hemorrhage, perforation	
		Irritation, ulceration in the mouth	Dysphagia	Severe dysphagia	
		Endoscopy :erythema, oedema	Endoscopy :ulcerative transmucosal lesions	Endoscopy: ulcerative transmural lesions	
Respiratory system		Irritation	Bronchospasm, hypoxemia	Manifest respiratory insufficiency	
		Breathlessness, dyspnea	Chest x-ray:-abnormal with moderate symptoms	Chest x-ray:-abnormal with severe symptoms	
Nervous system		Drowsiness, restlessness, cholinergic symptoms, parastesia, visual disturbance	Unconsciousness, confusion, seizures, visual disturbance, cholinergic or anticholinergic symptoms	Deep coma with response to pain, respiratory insuficiency, blindness	
CVS		Mild hypo or hypertension	Sinus bradycardia, tachycardia, myocardial ischemia	bradycardia, tachycardia, myocardial ischemia, shock	
Local effects from bites and stings		local swelling, itching, mild pain	local necrosis, swelling, moderate pain	Swelling involving the whole extremity and significant parts of adjacent area, more extensive necrosis, extreme pain.	

Treatment assessment and clinical outcome

Present study showed gastric lavage appropriateness was observed in 77 (73.3%) patients followed by skin decontamination 27 (25.7%).Appropriate decontamination method of treatment is due to early hospitalization of the victims.A similar study conducted by Maheswari E et al., showed that the gastric lavage (80.2%) was the most common first aid used for orally ingested poison.

In our study specific treatment (antidotes) was received in 76 (73.07%) patients. Out of 104 cases Inj.Atropine and Inj.Pralidoxime are prescribed in majority of patients 35 (33.3%) and in 23 (21.9%) patients received Inj.Atropine, followed by ASV 11 (10.47%) and n acetyl Cysteine prescribed in 1 (0.9%) patient. In 28 (27.6%) patients there is no antidotes are given to the patient.

The similar findings was observed in the study conducted by S.Siva et al., showed that Atropine (33%) and pralidoxime (17%) were used as antidotes for organophosphorous poisoning, vitamin K (10%) for Rodenticide, N-acetyl Cysteine (1%) for Acetaminophen.

The clinical outcome of our study showed that 100 (96.5%) patients are recovered from poisoning followed by 4 (3.84%) were died. This findings is similar to a study conducted by Maheswari E et al; that showed a 100 (99.01%) recovered and 1 (0.99%) died.

The increasing mortality rate of patients is due to the consumption of highly toxic substance, delayed arrival to the hospital and inappropriate treatment.

5. Conclusion

The study showed that most commonly observed intentional poisoning was pesticides. Among pesticides organo phosphorous were the most common poisoning admissions

that require intensive care admission and management and is a prime reason for the visit to the emergency department. Snake bite and honey bee sting was the most commonly observed unintentional/accidental poisoning. The high incidence of suicide by poisoning among young adults can be checked by frequent psychological counseling and by tackling their problems sympathetically

Majority of the study population was prescribed with antidote in a combination (atropine+pralidoxime). The severity of poisoning was assessed by using poison severity score. Most of the time the treatment has been done symptomatically so that the clinical presentations have been taken into consideration. Considering the treatment pattern, antibiotics and antiemetic were the most commonly prescribed category of drug. Decontamination especially gastric lavage, early use of specific antidotes, close observation, good supportive care were all the basis for the management of poisoned patient. Majority of patients recovered which indicates good emergency and intensive care management at this hospital.

6. Acknowledgement

The authors are grateful to the ministry of manpower for supporting the proposed researched activity and to the higher management, faculty and doctors of general medicine (emergency care unit) department of AHRC, for their continuous support and encouragement for providing the necessary infrastructure facilities for executing this work.

7. Conflict of Interest

The authors declare no conflict of interest associated with this work.

References

[1] Mate.V, A prospective observational study on pattern, severity and outcome of different poisoning cases in a tertiary care hospital, India."J Basic Clin Pharm". 2017;8: 154-57.
[2] Murari A, Poisonings in India. INJMS.2018;9:105-106.https://doi.org/10.1016/j.injms.2018.05.006.
[3] Sande D S, Kumar U P, Pattern of Acute Poisoning Presenting at a Tertiary Care Hospital. IOSR-PHR. 2017; 7 (9):39-42.
[4] Maheswari E, Abraham L, Chacko C S, Saraswathy G R, Ramesh A C, Assessment of pattern, severity &outcome of poisoning in emergency care unit. 2016; J Appl Pharm Sci.6 (12):178-83. doi: 10.7324/JAPS.2016.601225
[5] Vanishree, Chavan R.V, Arshad M, Raghunandan M, Faizuddin. A Study on pattern of acute poisoning in an emergency department of tertiary care hospital. Asian J Pharm Clin Res, 2016;9 (3):361-63.
[6] Prayag A, Ashtagi G S, Mallapur M D, Pattern of poisoning cases at a tertiary health care centre, Belagavi. Int J Med Sci public health. 2016;5 (8):1698-701. doi: 10.5455/ijmsph.2016.02122015289.
[7] Ashtaputre MD, Shah AP, Malviya PB, Clinical Profile and outcome of poisoning cases admitted to ICU in a tertiary care hospital. Sch. J. App. Med. Sci., 2017; 5 (2D):536-540. doi: 10.21276/sjams.2017.5.2.46
[8] Mahadik V, Waingankar P, Taralekar R, Anjenaya S, Thatkar P, Pilewar S, Gender difference in acute poisoning cases in an urban area in navi Mumbai, India. MGM J Med Sci, 2015;2 (3):120-124.
[9] Sriram S, Wilson N A, Study on management of various poisoning cases at a tertiary care teaching hospital. Int J Clin Pharmacol Toxicol. 4 (2) (2016) 220-223. doi: 10.14419/ijpt.v4i2.6712.
[10] Peter J V, et. al.Clinical features of organophosphate poisoning:A review of different classification systems and approaches. Indian J Crit Care Med.2014 Nov;18 (11):735-745;doi: (10.4103/0972-5229.144017).
[11] Rafiuddin M et al, A Prospective study on different types of poisoning cases and their outcome at tertiary care hospital. Int J Adv Pharm Med Bioallied Sci 2017;2017:126 :https://www.researchgate.net/publication/318900187.
[12] Gopinathan V, Padmakumar K, Profile and pattern of poisoning cases reported in a tertiary care teaching hospital in Kerala. IJFMP. July-September 2017; 4 (3):185-88. doi: 10.18231/2394-6776.2017.0040.