

Analysis and Prescription Pattern of Acute Poisoning

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Abstract:

Acute poisoning is a major problem that on worldwide we have to solve. When compared to worldwide we can see that India has recorded the highest incidence of acute poisoning. Self-harm and suicidal intention are the reasons for acute poisoning. Intensive care unit monitoring is required as acute poisoning is becoming a major problem. Proper identification of the poison and timely management helps a lot and also cost effectiveness of drugs also plays a major role, so development of a Hospital Formulary with National Essential Drug List may bring a lot of change in the health care sector. When compared to 2017 the rate increased in 2021, mostly people adopted oral route for ingestion of poison. In most cases antidepressants (19.2%) are used to consume.

Keywords: Acute poisoning, Intensive Care Unit, Mortality, Morbidity, Hospital Formulary.

Introduction:

The substance to which when exposed, injures or damages the body or puts an individual in a threatening condition is defined as a poison. The poison may be ingested or inhaled. The acute exposure to the poisoning is called as acute poisoning. Acute Poisoning is the leading cause of the mortality and morbidity across the world. It may occur due to accidental poisoning and suicidal attempts. World Health organisation (WHO) states that acute poisoning is costing nearly 200,000 lives globally which are of lower and middle-income countries (84%) of which India records the most ^[1]. As per Asawari R *et al.*, acute poisoning is observed in people who are with an intention of harming or ending their lives, as a result acute poisoning has been observed as a medical emergency causing increased mortality and morbidity. It has been a fourth leading cause of death in India ^[2]. Globally 14 - 20 % of suicides and 110,000 to 168,000 cases of casualties were reported because of pesticide poisoning during late 1990s. Agricultural pesticide poisoning is also observed as a major cause of global suicides that are being reported. Our country India is not an exemption in any cause of attempts. The spike in the global deaths in relation to the poisoning was

being observed during the inability to cope up the stressful conditions and in depressed conditions. These casualties were reported within very short span i.e., less than 30 minutes of planning. The decrease in the spike of the casualties that are being reported is possible by the guided assurance from family, health-care and social services ^[2]. The type and intensity of poisoning depends upon various factors such as accessibility of an individual to the poison, the traditional practices of an individual, occupational areas and exposure to the poison etc., In many of the developed countries, the major casualties that are reported because of the poisoning includes the use of detergents, cosmetic products, paracetamol such agents. Among all of them organophosphates poisoning were majorly observed ^[3]. Paediatrics was mostly susceptible for accidental poisoning whereas younger adults were seen susceptible for suicidal poisoning. The prior knowledge of the poisoning pattern aids in better management of the poisoning cases and so the mortality and morbidity rates could be decreased.

MATERIALS AND METHODS

Aim: To study and analyse the prescription pattern in the management of acute poisoning cases admitted in a tertiary care hospital.

Objectives:

1. To identify the most common type of poisoning encountered.
2. To identify the most common class of drugs misused as poison.
3. To analyse various methods used in emergency management.
4. To identify the reason for the poisoning.
5. To determine the average length of stay in hospital for various types of poisoning.
6. To access various biochemical parameters that are affected by each type of poisoning.

Study site: This study was carried out at the tertiary care hospital in Bhimavaram, Andhra Pradesh.

Inclusion criteria

1. All poisoning cases admitted to the hospital during the study period (2017-2021).
2. Patients of all age.
3. Patients of both genders.

Exclusion criteria

1. Patients who were admitted in the hospital not because of poisoning.
2. Patients who were brought dead to the emergency department.

Study Design: Our study is a retrospective observational study conducted over a period of five years, (2017-2021).

DATA COLLECTION

A specially designed data collection form was prepared in (Epi Info) and all relevant data including demographic details, medical and medication history, social history, details of management, type of poison intake and then data was collected. All the required details were collected from medical records in the hospital's Medical Record Department (MRD).

STATISTICAL ANALYSIS

The collected data were compiled using Epi info and Microsoft Excel. The results obtained were compared with relevant studies. Statistical tests

such as the chi-square test and odds ratio were carried out.

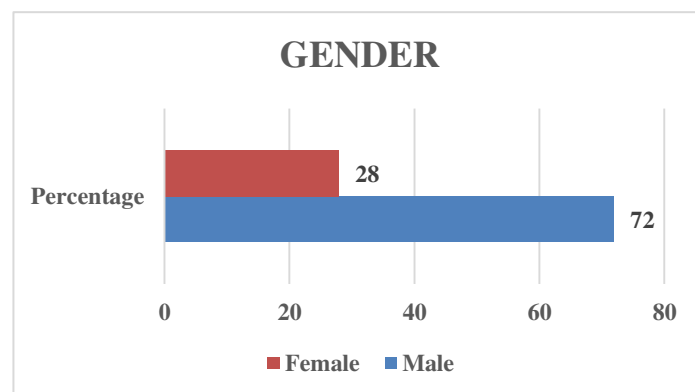
RESULTS

Figure 1: Gender distribution.

We observed in our study that males (72%) are more susceptible of taking the poison than females (28%).

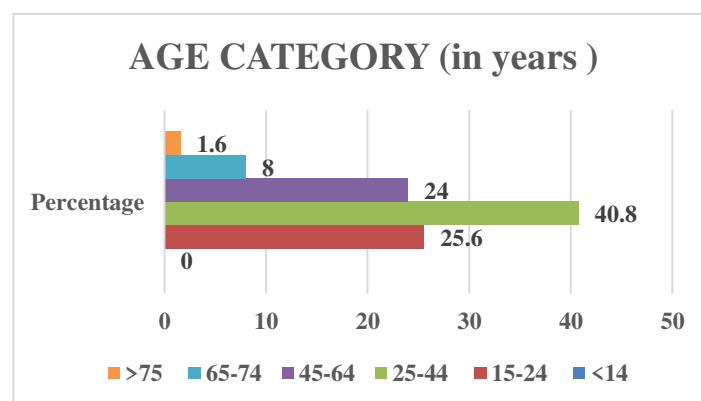


Figure 2: Age category.

It is observed that most of the patients belong to the 25-44 age group (40.8%) were susceptible of taking the poison and then 15-24 age group (25.6%) falls in order.

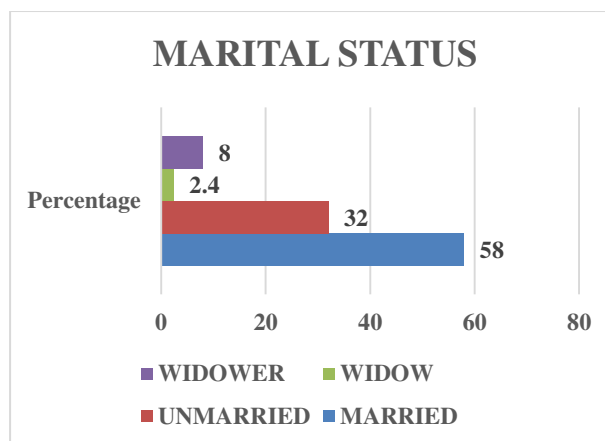


Figure 3: Marital status.

In our study we identified that majority of the poisoning patients were married (58%).

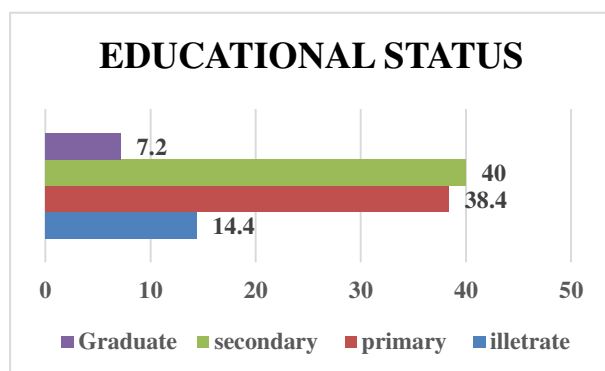


Figure 4: Educational Status.

In our study, patients who were with secondary education (40%) were found to be with more poisoning and then followed by Primary education (38.4%) and then the illiterate (14.4%). Graduates (7.2%) were found to be the least effected.

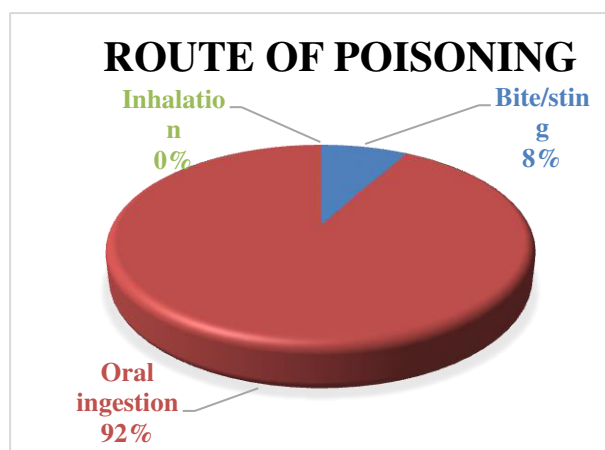


Figure 5: Route of Poisoning.

Among 125 patients, our study has identified that most of the poison cases were because of oral ingestion (92%) and poisoning occurred because of bite/sting contributed for 8%.

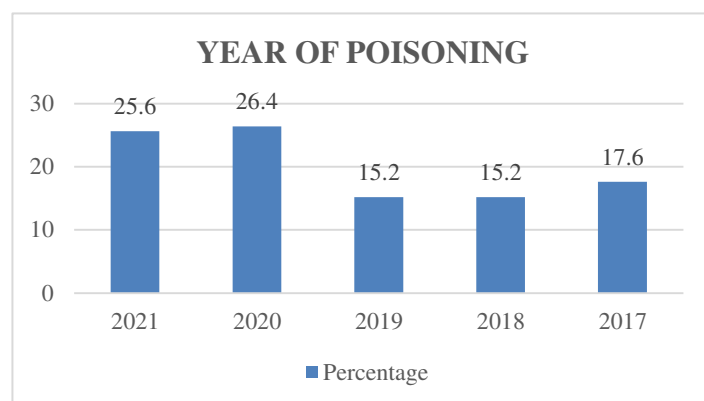


Figure 6: Cases admitted.

Our study identified that most of the poisoning cases were in 2020, they were 26.4%. Whereas least number of cases were found during 2018-19.

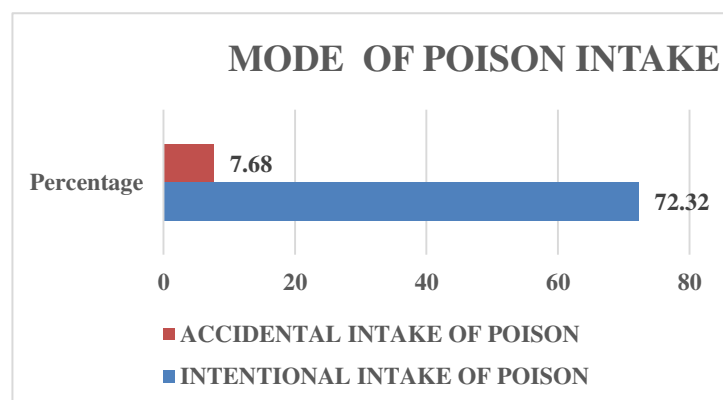


Figure 7: Mode of Poison intake.

Out of 125 patients, accidental intake of poison cases reported were 7.68% and Intentional intake of poison cases reported were 72.32%.

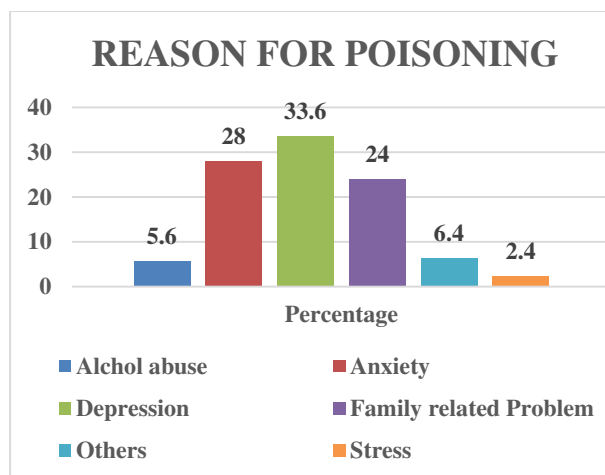


Figure 8: Reason for poisoning.

In our study, we identified that the most of the reasons for the poisoning is (33.6%) depression, (28%) anxiety, (24%) family-related problems, (6.4%) other reasons, (5.6%) alcohol abuse, (2.4%) stress.

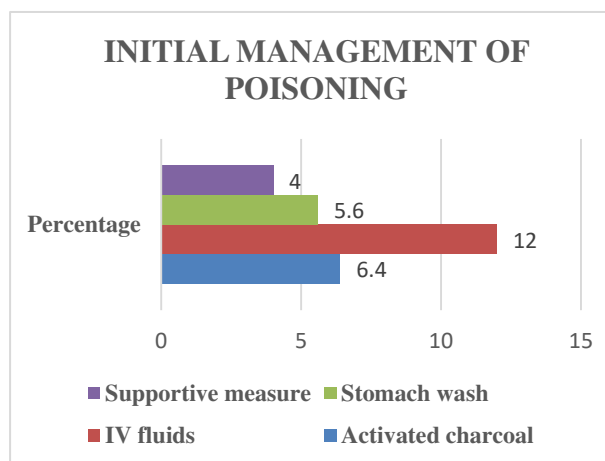


Figure 9: Initial Management of Poisoning.

In our study, we identified 12% of initial management of poisoning is done with Intravenous fluids, 6.4% with activated charcoal, 5.6% through stomach wash, 4% with supportive measures.

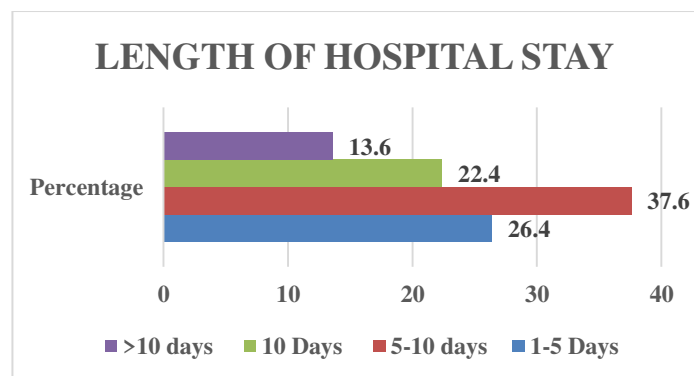


Figure 10: Length of hospital stay.

The patients with aduration of hospital stay for 5 – 10 days were found to be more (37.6%), patients who stayed for 1 – 5 days were found to be 26.4%, patients with 10 days of hospital stay were found to be 22.4% and 13.6% of the patients were with duration of >10 days.

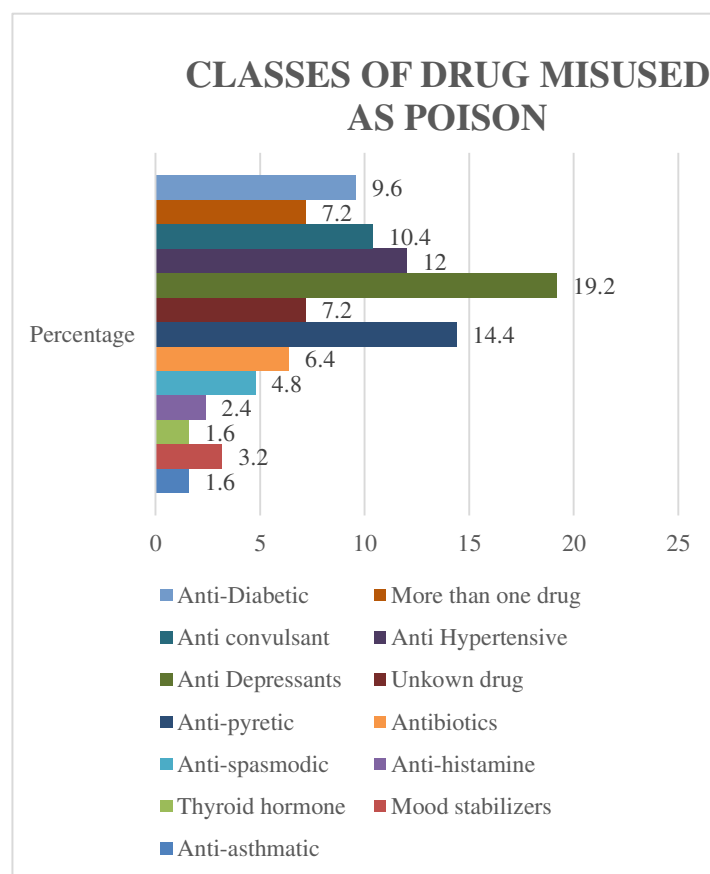


Figure 11: Classes of drug misused as poison.

In our study, we identified that classes of drugs that were misused as poisoning were (19.2%) antidepressant, (14.4%) Anti-pyretic, (10.4%) anti-convulsant, (12%) antihypertensive, (9.6%) anti-

diabetic and unknown drugs (7.2%), (6.4%) antibiotics, (4.8%) antispasmodic, (3.2%) Mood stabilizers, (1.6%) thyroid hormone, (1.6%) anti-asthmatic.

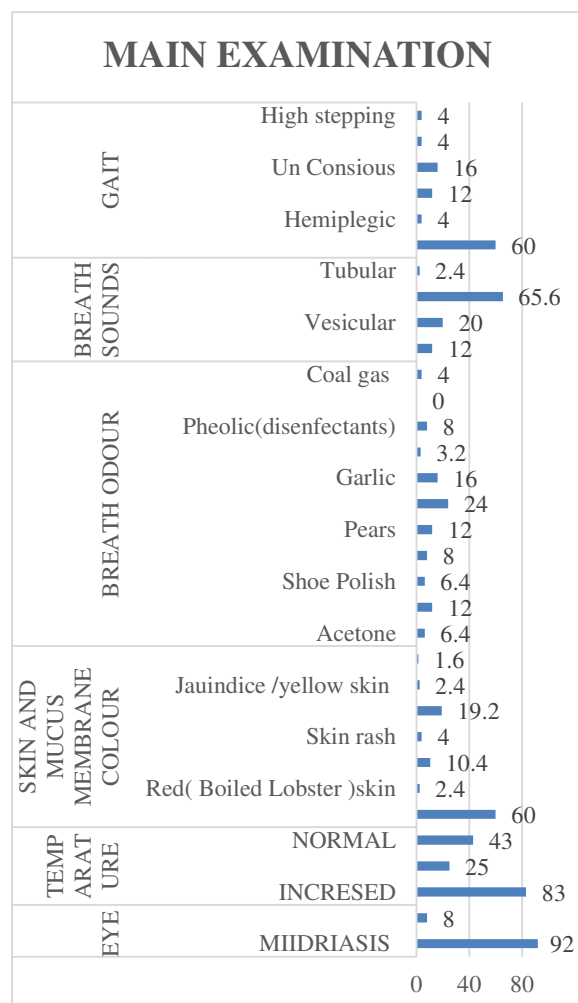


Figure 12: Main Examination.

In our study while performing eye examination to the patient about 92% of cases were observed with mydriasis and 8% of the patient showed miosis. Normal body temperature is observed in 28.7% of patients whereas 55.3% of patients were with increased body temperature and 16.7% with decreased body temperature. Most of the patients (60%) experienced discoloration of the mouth/pharynx, 19.6% were with normal skin, many of them experienced hyperaemia (10.4%), red(Boiled lobster) skin, jaundice/yellow discoloration of skin (2.4%), skin rash (4%) and itching of the skin(1.6%). The Breath odour of the various poisoning patients were with the odour of alcohol (24%),Garlic (16%),pear (12%), bitter almonds (8%) (12%), shoe polish and acetone odour

(6.4%),Ethereal sweet (3.2%),coal gas (4%),stable tobacco (0%). Different breath sounds of the poison consumed patients showed Normal breath sounds(65.6%), Vesicular type of breath sounds(20%), Amphoteric type of breath sounds(12%), Tubular type breath sounds(2.4%).

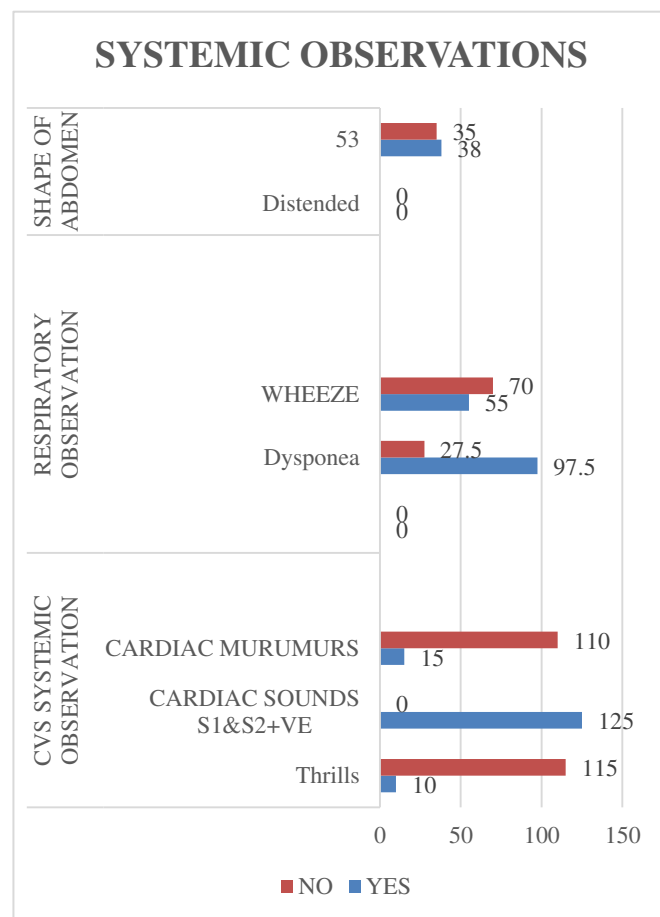


Figure 13: Systemic observations.

The study shows that during respiratory examination of the patient, about 97.5% patients have dyspnoea, and around 55 patients showed wheezing. 53% of the patients were with Distended abdomen shape, 38% were Obese, 35% were with Scaphoid shape of the abdomen.

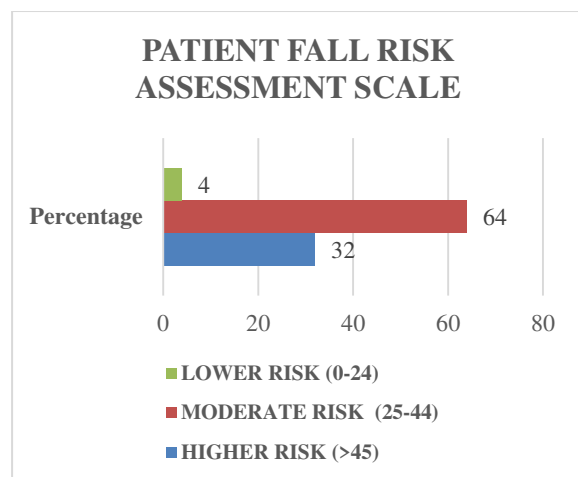


Figure 14: Patient fall risk assessment scale.

In our study, it states that on the patient fall risk assessment scale, about 32% were at higher risk, 64% were at moderate risk and 4% were at lower risk.

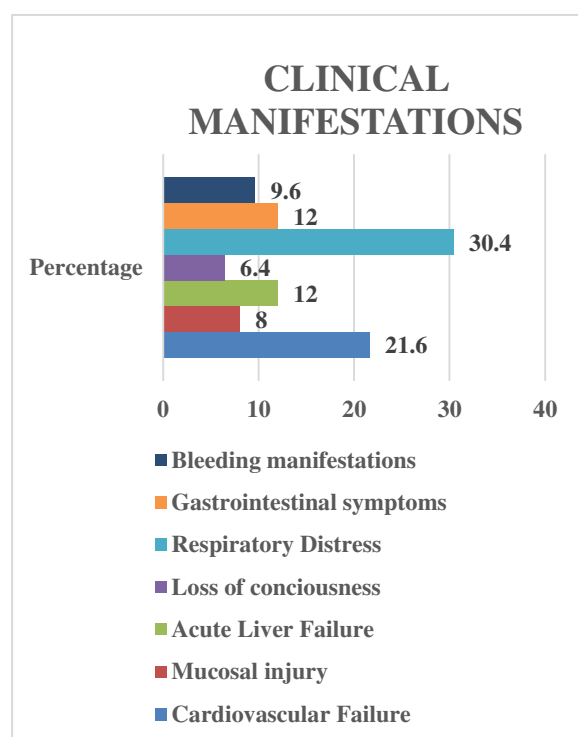


Figure 15: Clinical manifestations.

In our study, we have observed that most of the patients experienced respiratory distress (30.4%), cardiovascular failure (21.6%), Gastrointestinal symptoms and Acute liver failure (12%), Bleeding manifestation (9.6%), Mucosal injury (8%).

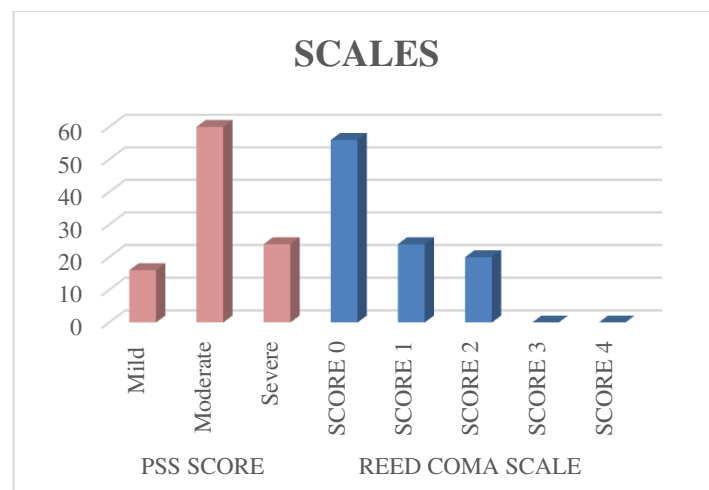


Figure 16: Scales.

In our study, we identified that Poison severity score (PSS) of different types of each poisoning was 60% of the patients in moderate, around 24% of the patients are in severe condition, 16% of the patients in mild condition. Reed Coma Scale of the poisoning patient in our study is about 56% score 0, 24% of the patient scored 1, 20% scored 3, none scored 3,4.

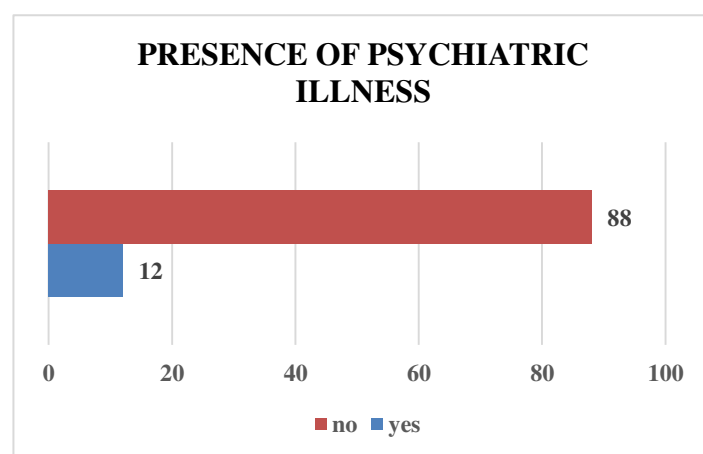


Figure 17: Presence of Psychiatric illness.

In our study, we identified the patients admitted majorly were not having any psychiatric illness (88%), patients with psychiatric illness were found to be 12%.

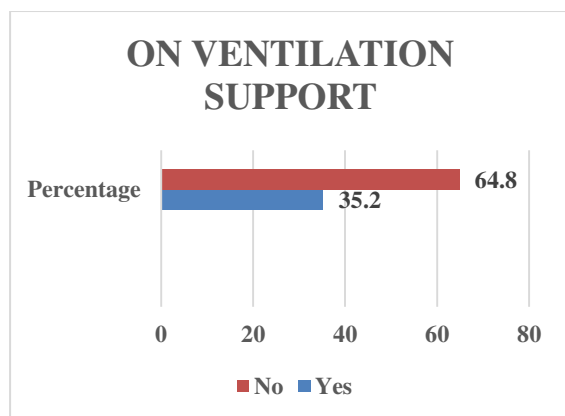


Figure 18: Patients receiving ventilatory support.

In our study, we identified that most of the patients were not in ventilation support (64.8%) whereas 35.2% were on ventilation support.

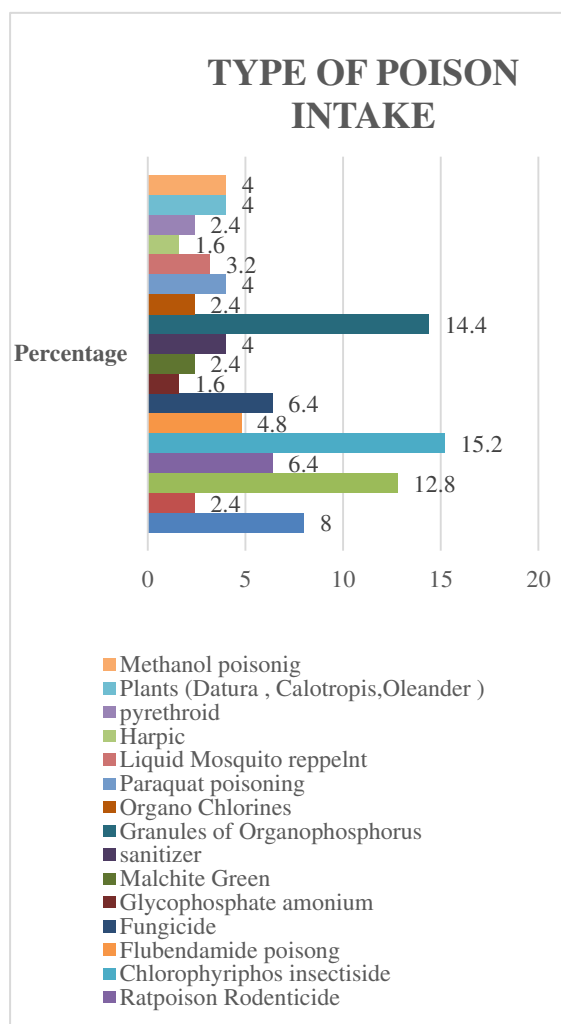


Figure 19: Types of poison intake.

In our study, we identified various types of poisoning that involved are chlorpyriphos

insecticide (14.4%), granules of organophosphorus(15.2%), drug overdose(12.8%), snake bite (8%), fungicide(6.4%), flubendamide(4.8%), plants such as Datura, Calotropis, oleander(4%), liquid mosquito repellent(3.2%),pyrethroid(2.4%), methanol (4%), paraquat(4%), arthropod /sting bite (2.4%), rat poison Rodenticide(12.8%), organ chlorines (2.4%), sanitizer (4%),glyphosate ammonium (1.6%), malachite green (2.4%).

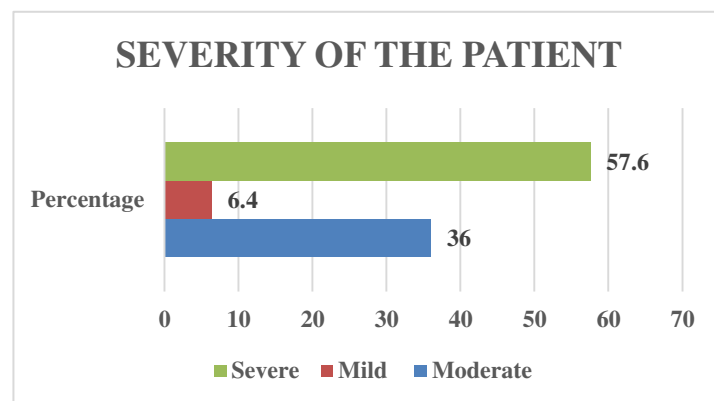


Figure 20: Severity of the patient.

In our study, we identified the 57.6% patients are with severe poisoning condition,36% were with moderate poisoning and 6.4% were with mild severity.

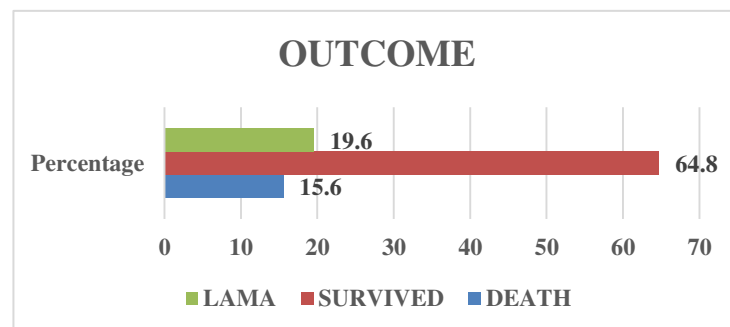


Figure 21: Outcome.

In our study, we observed that 64.8%of patients survived, 19.6%were LAMA (left against medical advice) and remaining15.6% of patients expired due to delay in hospital arrival and increased risk of severity of the patient.

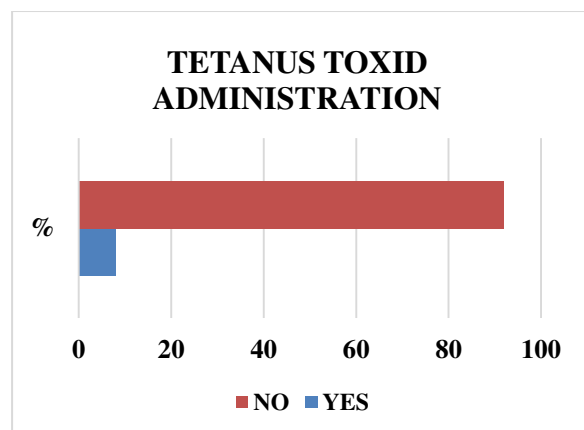


Figure 22: Tetanus Toxoid administration.

In our study, we identified that in poisoning patient (snake bite) tetanus prophylaxis are advised in 9% of cases.

were with altered clotting time, 12% were with altered clotting time, 14% were with altered Prothrombin time and around 52% of the patient showed altered Random Blood Sugar.

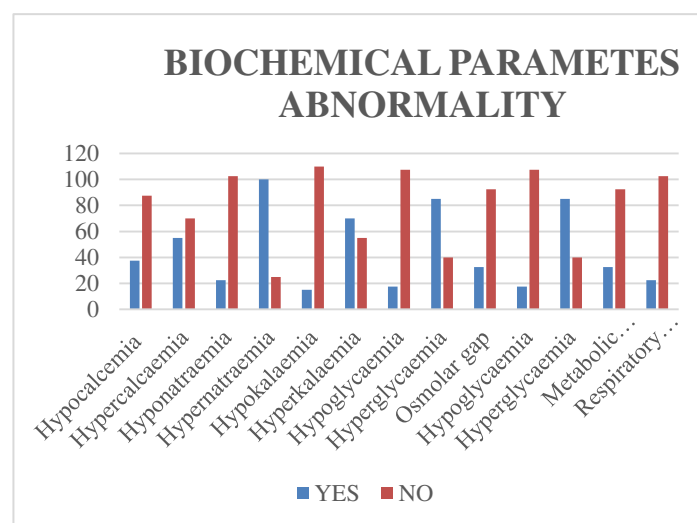


Figure 24: Biochemical Parameters Abnormalities.

In the study, the abnormalities that we have observed in poison patients were Hypocalcaemia(30%),Hypercalcaemia (44%),Hyponatraemia (18%), Hypernatraemia (80%),Hypokalaemia (12%),Hyperkalaemia (56%),Hypoglycaemia (14%),Hyperglycaemia (68%),Osmolar gap (26%),Hyperglycaemia (68%),Metabolic acidosis with an increased anion gap(26%) and around 18% showed altered respiratory acidosis.

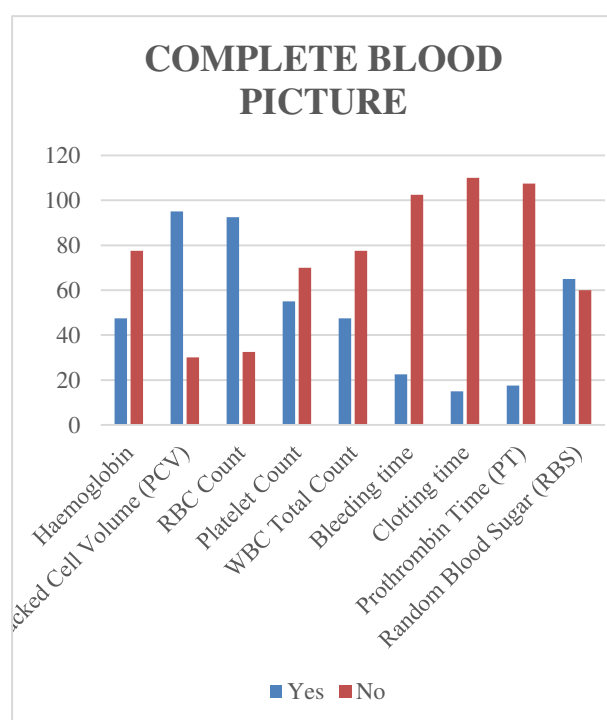


Figure 23: Complete Blood Picture.

The complete blood profile of the poisoned patients, various parameters were found to be altered. Nearly 62% of the patients were with altered Haemoglobin, 76% were with altered Packed Cell Volume (PCV), 74% were with altered red blood cell Count, 44% were with altered platelet count, 38% were with altered White blood cell count, 18% were with altered Bleeding time, 12%

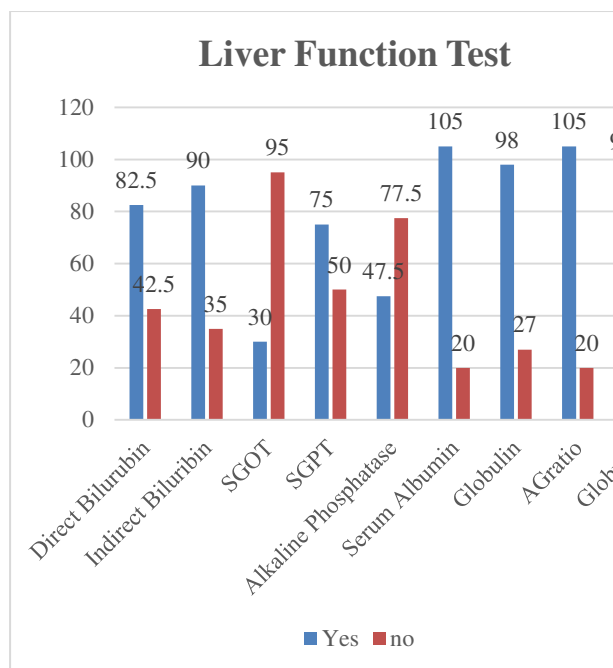


Figure 25: Liver Function Tests.

In our study, the abnormalities that are observed in liver function test were Total Bilirubin (42%), Direct bilirubin (66%), Indirect bilirubin (72%), SGOT (Serum glutamic oxaloacetic transaminase) (24%), SGPT (Serum Glutamic Pyruvic Transaminase) (60%), Alkaline phosphatase (38%), Serum Albumin (84%), Globulin (78.4%), A/G ratio (84%).

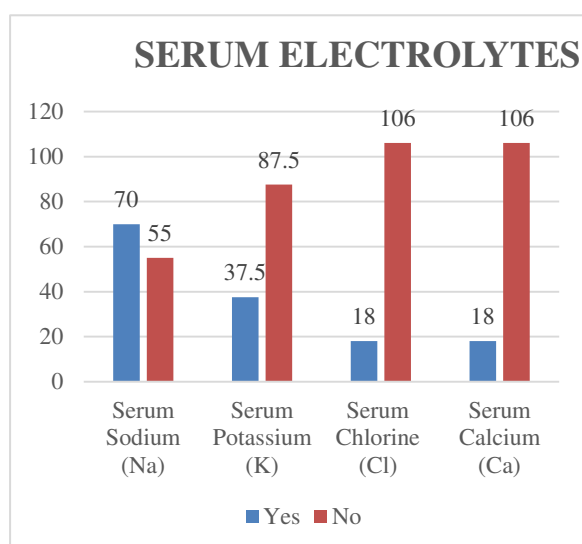


Figure 26: Serum Electrolytes.

In the study, we observed the abnormalities of Serum electrolytes were Serum Calcium (14.4%), Serum Chlorine (1.4%), Serum Potassium (30%), Serum Sodium (56%).

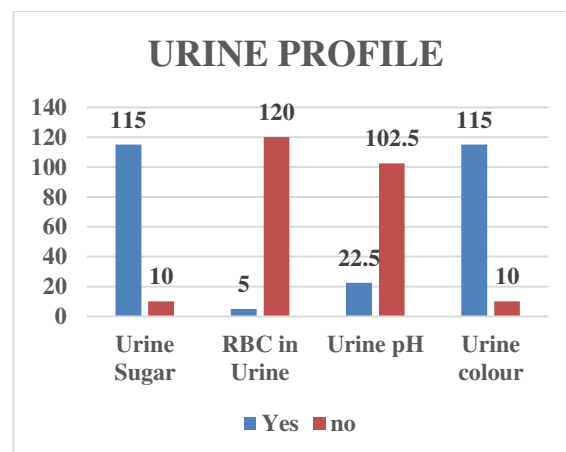


Figure 27: Urine Profile.

In the study, we observed the abnormalities found in the urine profile of the poisoned patients are abnormality in Urine sugar (92%), RBC in urine Haematuria Condition (4%), Changes in the urine pH (18%), Changes in the Urine Colour (33%).

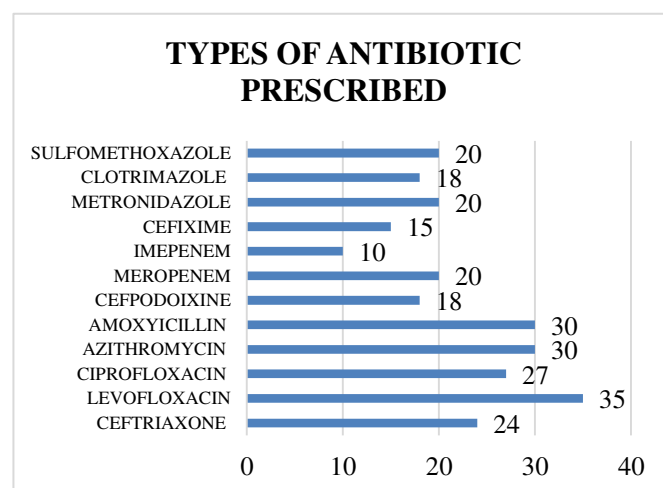


Figure 28: Antibiotics Prescribed.

Our study Shows the various types of Antibiotics that are prescribed for the management of poisoned patients were Levofloxacin (35), Amoxycillin, Azithromycin (30), ciprofloxacin (27), Ceftriazone (24), Sulfamethoxazole, Metronidazole, Meropenem (20), Imipenem (10).

DISCUSSION

In our study, major of the patients were males which is also found in J Gargi *et al.*,^[3] and most of the patients were belonging to 25-44 age group (40.8%) which is found similar to P Ali *et al.*,^[4]. Our study shows that most of the poison intake

patients were married and are of rural areas and were educated until secondary, this is supported and explained by Karki, R K *et al.*,^[5] the most frequent reason for poisoning is depression according to our study this statement is supported by various parameters such as marital condition, socio- economic status of the patients.

According to Ramesha K *et al.*,^[6] and our studydepressed state also contributes to the poisoning, the most common class of agents that are being misused as poison are antidepressants according to our study and also Radhakrishnan A *et al.*,^[7]it also states that altered mental status also leads to depression as a results patients are mostly found to be taking anti-depressants so as to cope up the situation.

Our study shows that most common type of poisoning was organophosphates and these symptoms were found to be lasting longer and the increased duration of the hospital stay and longer ventilation support is supported by Lee D *et al.*,^[8] and SungurM *et al.*,^[9]. In our study we identified that most frequently used antibiotic was found to be levofloxacin belonging to the class fluoroquinolones, whereas in according to P. D. Asari *et al.*,^[10] the most frequently prescribed antibiotic was found to be cephalosporins. On studying the patient related outcome, the percentage of the survived patients is more which is also evident in P. D. Asari *et al.*,^[10].

CONCLUSION

Our study has observed that poison susceptibility has been increased in alcoholics, hence management of psychological behaviour in alcoholics is crucial. Most of the patientshas expired while being transported to the hospital from the place of incidence. Due to lack of knowledge in emergency management of acute poisoning, the increase in deaths has been observed. Hence clinical pharmacist should inculcate the knowledge of emergency management of acute poisoning. Majority of poisoning cases were observed in patients who have been failed to handle the stressful conditions, so as to decrease the casualties of acute poisoning with stress conditions, we suggest consultation of psychologist or psychiatrist whenever an individual

feels stress due to some life events. The false stigma of the society should be avoided while visiting psychiatrist or psychologist clinic.

ABBREVIATIONS:

- CVS: Cardio Vascular System.
- LAMA: Left Against Medical Advice.
- MRD: Medical Record Department.
- PCV: Packed Cell Volume.
- PSS: Poison Severity Score.
- RBC: Red Blood Cell.
- SGOT: Serum Glutamic Oxaloacetic Transaminase.
- SGPT: Serum Glutamic Pyruvic Transaminase.
- WHO: World Health Organisation.

ACKNOWLEDGEMENT

We thank **God** for the blessings in completing this work. We express our gratitude towards our **Parents** for their constant support for us. We deeply thank our guides **M. Raghu Bapi Raju sir, Dr. Shaik Faizan Ali sir** and **D. Praveen kumar sir** from the bottom of our heart for their enduring guidance in completion of the work. We also thank our institution **Shri Vishnu College of Pharmacy** for letting us in performing the study.

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