COLLEGE OF HEALTH SCIENCES, SCHOOL OF MEDICINE

DEPARTMENT OF EMERGENCY MEDICINE & CRITICAL CARE

ASSESSMENT OF OUTCOME AND ASSOCIATED FACTORS OF ADULT POISONING CASES AT TIKUR ANBESSA SPECIALIZED HOSPITAL, ADDIS ABABA, ETHIOPIA

BY- BELAYNEH DESSIE (MD, EMCC RESIDENT)

A RESEARCH PAPER TO BE SUBMITTED TO DEPARTMENT OF EMERGENCY MEDICINE AND CRITICAL CARE, COLLEGE OF HEALTH SCIENCES, ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR SPECIALTY IN EMERGENCY MEDICINE AND CRITICAL CARE

OCTOBER, 2021

ADDIS ABABA, ETHIOPIA

ASSESSMENT OF OUTCOME AND ASSOCIATED FACTORS OF ADULT POISONING CASES AT TIKUR ANBESSA SPECIALIZED HOSPITAL, ADDIS ABABA, ETHIOPIA

BY: BELAYNEH DESSIE (MD, EMCC RESIDENT)

ADVISORS: Dr. SOFIA KEBEDE (MD, ASSISTANT PROFESSOR OF EMCC)
Dr. BIRHANU TESFAYE (MD, ASSISTANT PROFESSOR OF EMCC)

OCTOBER, 2021
ADDIS ABABA, ETHIOPIA

ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF MEDICINE

DEPARTMENT OF EMERGENCY MEDICINE & CRITICAL CARE

SPECIALTY IN EMERGENCY MEDICINE & CRITICAL CARE RESEARCH PAPER SUBMISSION FORM

Name of investigator	Dr. Belayneh Dessie
Full title of the research project	Assessment of Outcome and Associated factors of adult poisoning cases at Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia from January 1,2015 to December 31, 2020
Duration of the project	December 2020, to October, 2021
Study area	Tikur Anbessa Specialized Hospital
Total cost of the project	25,797.5 ETB
Address of the investigator	Tel: +251-918-082-153 e-mail: belayneh_dessie@yahoo.com
Name of advisors	Dr. Sofia Kebede (MD, assistant professor of EMCC) and Dr. Birhanu Tesfaye (MD, assistant professor of EMCC)

ACKNOWLEDGMENT

I would like to thank department of Emergency medicine and Critical care for providing the opportunity to do research and the University as a whole for their support.

I would like to thank my advisors Dr. Sofia and Dr. Birhanu for their invaluable advice and support through the process of preparing this research paper.

My special acknowledgment goes to Dr. Hywet Engida for her constructive comments during title defense of this paper.

Finally, I would like to thank central data collectors and supervisors for their commitment through the process of data collection.

Table of Contents

LIST OF FIGURES

LIST OF TABLES

ACRONYM AND ABBREVIATIONS

AAU	Addis Ababa University
AOR	Adjusted Odds Ratio
CI	Confidence Interval
CO	Carbon monoxide
COR	Crude Odds Ratio
Df	Degree of freedom
ED	Emergency Department
EMCC	Emergency medicine and Critical care
ENT	Ear, nose and throat
FMOH	Federal ministry of health
GI	Gastro intestinal
IQR	Interquartile Range
JUSH	Jimma University Specialized Hospital
KM	Kilo meter
MD	Medical doctor
MICU	Medical Intensive Care Unit
MRN	Medical record number
OP	Organophosphates
PI	principal investigator
PPI	Proton Pump Inhibitors
SPSS	Statistical Package for the Social Sciences
TASH	Tikur Anbessa Specialized Hospital
UGIB	Upper gastro intestinal bleeding
USA	United States of America
WHO	World Health Organization

ABSTRACT

Background: With the widespread availability of a vast number of chemicals and drugs, acute poisoning is a common medical emergency worldwide. Morbidity & mortality associated with poisoning is becoming a major public health issue in many countries. Although it has been known that this public problem is a pressing issue in Ethiopia, the extent and magnitude of poisoning is not yet properly explored.

Objective: The objective of this study was to assess outcome and associated factors of adult poisoning cases at Tikur Anbessa Specialized hospital.

Methods: This was hospital based cross sectional study of adult poisoning cases at TASH from January 1, 2015 to December 31, 2020. Data was collected through retrospective chart review by using structured questionnaire which was prepared from previous literatures with few amendments. The data was coded, cleaned and entered in to SPSS version 26 software program for further analysis. Descriptive statistics, bivariate and multivariate analysis was done to assess the outcome and associated factors and the odd ratio obtained was used as approximation of relative risk. P values less than 0.05 were considered significant.

Results: The overall case fatality rate was **13.7%** and the overall discharge rate was **86.3%**. The common causes of death were Rodenticides (n=10), Barbiturates (n=8) and Organophosphates(n=5). Relative to rural, being from urban place of residence was strongly associated with discharge (AOR=6.384, 95%CI=1.270-32.098, P=0.024). Relative to other main management options, patients who required intubation were less likely to be discharged (AOR=0.045,95%CI=0.003 0.776, p=0.033).

Conclusion: In this study the overall case fatality rate was 13.7% which is very high as compared to the findings of other studies done in the country so far. Urban place of residence & management with intubation were independent predictors of outcome. Awareness on proper handling of chemicals should be forwarded to users of these agents by public health workers

Key words: Adult poisoning, Outcome, Tikur Anbessa specialized hospital

CHAPTER ONE

1. INTRODUCTION

1.1. Back Ground

Advances in technology and social development have resulted in the availability of most drugs and chemical substances in the community. These chemical substances pose a significant treat due to their poisonous effect and the extensive use in medicine, agriculture, industry and residential environments [1].

Poisoning is a qualitative term used to define the potential of a chemical substance in acting adversely or deleteriously on the body. All cases of poisoning that result from accidental use of a drug or chemical substance or the use of drugs by children due to lack of curiosity are known as accidental or nonintentional poisoning. Poison is a substance capable of producing damage or dysfunction in the body by its chemical activity after it is swallowed, inhaled, injected, or absorbed. The resulting effects of the exposure may be localized or generalized; it may also be topical or systemic [1, 8].

In most cases, the detailed mechanism of poisoning is unknown but the time between the exposure and the resulting toxic effects determines whether the exposure is acute or chronic. Whether the effects follow a single dose or a series of doses or exposures, when the effects appear within 24 hours, this is termed acute poisoning [2]. Acute poisoning is a medical emergency and it is a common reason for visits to emergency departments and hospitalization. Morbidity and mortality associated with it is becoming a major public health issue in many countries [3].

Pesticides and drugs are the common agents causing the incidence. Agrochemical pesticides are a major public health problem throughout the developing world. Central nervous system acting drugs are the commonest medicines used for self- harm throughout the developing world cities. While there are few case series of antiepileptic, benzodiazepines or antidepressants, barbiturates were an extremely common means of self poisoning during the 1970s and large series exist from this time [6,7]

Household products like kerosene oil used for lighting, cleaning agents such as Dettol (chloroxylenol) and bleach, and strong acids such as sulpheric acid used for drain cleaning are a major problem within some Asian and African communities [4].

Organophosphate pesticides were responsible for the majority of deaths in most series of self poisoning cases, particularly those from rural areas. Organophosphate (OP) compounds are diverse group of chemicals used in both domestic and industrial settings [5].

It is estimated that some types of poisons are directly or indirectly responsible for more than 1million illnesses worldwide annually. However, since most poisoning cases in the world go unreported, the exact number of incidences can be even higher [9]. World Health Organization (WHO) estimates that the total number of acute accidental poisonings throughout the world ranges from 2-3 million cases annually; of which 1 million are severe poisonings resulting in 20, 000 deaths annually; while the estimated annual intentional poisoning number is about 2 million resulting in 200,000 suicides [10,11]. Every day in the USA1941 patients is treated in Emergency department (ED) and nearly 82 people die as a result of accidental poisoning. In 2007, 29846(74%) of the total 40059 poisoning deaths in the USA were unintentional, and 3770 (9%) were of intentional [14]. Many studies also reveal that acute poisoning has been identified as a significant cause of both morbidity and mortality in developing countries and the mortality is very high. In India, the mortality due to poisoning varies between 15 to 30% and poisoning is the fourth most common cause of mortality in rural India [15]. In Sri Lanka, the reported mortality is 10% and acute poisoning is among the leading ten causes of hospital death in the country [16]. In Botswana, acute poisoning contributes to 7% of morbidity and ranks third among injuries leading to hospitalization [3,17].

1.2. Statement of the problem

Though a lot is known and documented on poisoning on a global perspective, very little is known on its prevalence, management practice and outcome in most developing countries. Furthermore, although there are good databases in developed countries concerning poisoning surveillance system, there are no formal and well-established poison control centers to collect such data in most of the low-income countries. Hence, information on this public health issue remains insufficient [12]. Studies with regard to pattern of poisoning in a particular region

would help to identify the risk factors and allow early diagnosis and management of such cases, which in turn should reduce morbidity and mortality in the public [13].

There are few studies done on prevalence of acute poisonings in Ethiopia. The existing little hospital-based studies revealed that the case fatality rate was reported to range from 1.5% to 8.6%. Despite the rapidly growing role of chemicals in the country, lack of poison centers and toxicological expertise among health professionals may increase the likelihood of adverse health impacts of acute poisoning to the public [18, 19, 20]. Study done in Tikur Anbessa specialized hospital and Ambo University hospital in 2010 and 2020 respectively showed that the case fatality rate from acute poisoning was about 8.6% and 1.5% respectively [18,19].

1.3. Significance of the study

Since there are few studies done on poisoning in this country, and no study done to assess outcome of poisoning cases at TASH, it is believed that valuable information will be gained from the study. The findings of the study would help in identifying gaps and potential intervention areas with respect to management practice at ED and MICU. The findings would also show the outcome and other predictors of acute poisoning cases for the hospital managers as well as concerned stakeholders to work on quality of care. The findings would also help for policy makers to develop strategies and guidelines to improve quality of care and decrease mortality. The findings will also be quite informative to emergency department about case exposures towards their residents. Besides, it would serve as a baseline for further multicenter study in the area of poisoning.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 World wide

A study done on 5009 patients aged ≥11 years with acute poisoning presented to the ED in Shenyang Hospital, China, from January 2012 to December 2016showed that: Over half (52.7%) were in the 20–39 age group. The female to male ratio was 1.2:1. The majority of patients consumed poison as suicide attempts (56.7%). Men were more commonly poisoned by drug abuse than women, but women outnumbered men in suicidal poisoning. The most common form of exposure was ingestion (86.2%). The five most common toxic agent groups, in descending order, were therapeutic drugs (32.6%), pesticides (26.9%), alcohol (20.7%), fumes/ gases/vapors (11.4%) and chemicals (3.6%). Sedatives/ hypnotics in the therapeutic drugs group and paraquat in the pesticides group were the most common toxic agents, respectively. Being female and young adults (ages 20-29 years) were strongly associated with intentional poisoning (P value <0.001). It was noted that gastric lavage and activated charcoal were administered in (72.5%) and (64.8%) of cases respectively. Some (7.7%) of cases received hemodialysis treatment. All patients with OPs poisoning (n=232) were treated with atropine and pralidoxime. In addition, hyperbaric oxygen therapy for CO poisoning was performed in all cases (n=556). The case fatality rate was 1.3% [21].

A study done in Nepal from 582 data collected in central, zonal, and district level hospitals showed that females were found to be more susceptible to the intentional incidence than males (P value=0.000). Intentional poisoning for unmarried male was found to be more (34%) than for female. On the contrary, intentional poisoning in females was high in case of married subjects (57%) (P value =0.000). The most common type of poisoning causing the intentional attempts was organophosphates (40%) followed by phosphides (14%). On the other hand, accidental poisoning was most common due to the unclassified and other agents (8%) which were followed by hydrocarbons (6.3%). The most common organophosphate used for intentional attempts for poisoning is methyl parathion (31%) when compared with other groups of OPs (26%). Sedatives and hypnotics were the most common type of drugs (43%) used for intentional attempts. Most of the cases were found to be cured (84.8%).

Accidental intake of hydrocarbons was found to be most frequent in the children (33%) while intentional intakes of other agents were more frequent in adults (97%). Most of the intentional incidence adding to mortality is caused by OPs (66.7%) followed by phosphides (19%). Subjects between age groups 15-24 years are more likely to cause the intentional exposure (44%) while children below 5 years are more likely to cause accidental exposure (6%) (P value=0.000) [1].

2.2 African perspective

Medical records of 424 patients admitted to eight hospitals in South Africa, from January 2005 to June 2005, were evaluated retrospectively. The median age was 17.6 years and 57.8 % were females. Fifty-nine percent of the poisonings were accidental, and the involved toxic agents were, in descending order: household chemicals (45.7%), modern medicines (17.5%), animal/insect bites (15.8%), agrochemical chemicals (9.7%), food poisoning (5.4%), drugs of abuse (3.3%), traditional medicines (2.4%), and plants (0.2%). Poisoning by drugs of abuse was more common in males than females, but the percentage of females poisoned by all other toxic agents was higher than in males. Deliberate poisoning was more prevalent in females (48.4%) than in males (31.3%). Most patients stayed less than two days in hospital, but more females (70.1%) than males (29.9%) stayed for more than two days. The overall case fatality rate was 2.4 % [3].

Study done in MNH –tertiary referral hospital in Dares salaam showed that: alcohol was the commonest substance of poisoning (50%), and 59.4% were intentional poisoning. Tachypnea (64.2%) and altered mental status (62.3%) were the commonest presentations. Considering outcome death occurred in (0.9%) of cases and (6.6%) of cases discharged home [22].

2.3 Ethiopian perspective

A study done in Ambo town on patients admitted with acute poisoning at two hospitals between 01 January 2018 to17 March 2019showed that the prevalence was 1.7%. The female to male ratio was 1:1.06. The most affected individuals were in the age range of 18 to 29 years (50.7%) for both genders. The most common cause of poisoning were organophosphates (53.7%). Besides, intentional poisoning was the most common (76.9%) circumstance of poisoning and family disharmony was the common reason (35.9%). All

cases arrived to the hospitals within 5 hours. The case fatality rate was (1.5%). The independent predictors of poor treatment outcome were age ≥35 years (p-value= 0.049), female gender (p-value= 0.027), and hospital stay of >48 hours (p-value= 0.035) [18].

A one-year record based retrospective study conducted on acute poisoning for 103 patients at JUSH showed (52.4%) were females and (47.6%) were males. The highest prevalence was observed in persons aged 12–20 years (67.96%). Majority (50.5%) of the cases were intentional, and (27.2%) of the cases were accidental poisoning. Ingestion (94.25%) was the commonest route and inhalational exposure occurs in 5.75% of patients. House hold cleansing agents, organophosphates, and drugs (41.7%, 27.2%, 12.6%) were commonest causes respectively. Diarrhea and vomiting, altered consciousness and epigastric pain (49.5%, 16.5% and 13.6%) were the common presenting symptoms respectively. Among 54 patients who reported their reason for poisoning, the commonest reasons were quarrel (family, marital) (75.9%), psychiatric problem (14.8%) and substance abuse (9.3%). Considering time of arrival, (52.4%) of patients presented to the hospital between 30 minutes and 1 hour after exposure, and only (8.7%) arrived within 30 minutes. The rest arrived between 1 hour and 24 hours (38.8%). GI decontamination was performed for (78.6%) and specific antidotes were given for (12.6%) of cases. The rest of the victims obtained other managements (8.7%). Most of the cases (61.2%) were improved and discharged. The case fatality rate was (5.8%). Psychiatric referral and specific education were given for 8.7% and 40.8% of the cases respectively upon discharge. Intentional poisoning was significantly associated ($P<0.05$) with the age ($P=0.0002$) and the marital status of the victims ($P<0.0001$). [23].

Study done at Adama Hospital Medical College over 2 years of period from 2013 to 2015 revealed that the most common affected patients were in the 21–30-year age-group (39.5%). The highest number of patients were farmers (18.8%) followed by unemployed individuals (18.2%). Majority of the patients lived in rural areas (68.8%). Organophosphates were the most commonly used toxic agents (52.1%), followed by household cleaning products (12.7%) and alcohols (10.3%). The treatments delivered were GI-decontamination for (56.6%) of patients, atropine for (37.8%) of OP-poisoned patients, and high-pressure oxygen for 5(1.7%) of carbon monoxide poisoned patients. The case fatality rate was 1.37 % and all

of them were due to complications of OP poisoning. Age ranges between 21-30 years were strongly associated with suicidal intention (p value <0.001) but there was no significant difference between genders for intention of poisoning (p value =0.147). Men were more commonly affected by OPs, alcohols, and kerosene, whilst women were mostly affected by household cleaning products, rat poison, CO and contaminated food (P value =0.011). Use of OP compounds, rat poison, household cleaning products and kerosene for poisoning was significantly more common in rural patients, while CO poisoning was only observed in urban residents (P value =0.010) [24].

Retrospective chart review of 116 adult patients who presented to Tikur Anbessa Specialized University Hospital from January 2007 to December 2008 was done. Females (64.6%) outnumbered males. Mean age was 21 years. Considering place of residence most (89.6%) were from Addis Ababa. Most (96.5%) were intentional self-harm poisonings. Household cleansing agents (43.1%), organophosphates (21.6%) and phenobarbitone (10.3%) were the leading causes of poisoning. Intentional self-harm poisoning was the commonest circumstance described accounting for 112 (96.6%) of 116. The common presenting complaints were Loss of consciousness (46.2%), vomiting (23.8%) and epigastric pain (22.5%). A total of 13(11.2%) patients had already known mental illness and 12 of them poisoned by using their own medications. Among patients who reported their reason of poisoning, temporary quarrel (57%) and emotional disturbance (26%) were commonest reasons. The median time from poison exposure to hospital presentation was 3 hours. Majority of patients (94.3%) presented to the hospital within 12 hours of exposure. Home treatment had no statistically significant beneficial association with the outcome (OR =1.428, 95%CI=0.343-5.959). Of 116 patients, (75%) were treated at emergency unit, (13.8%) were admitted to MICU and (11.2%) were admitted to the medical wards. The case fatality rate was 8.6%. The common causes of death were organophosphate (5/25) and phenobarbitone poisoning (3/12). Psychiatry consultation was made for 17.2 % of patients in the hospital [19].

CHAPTER THREE

3. OBJECTIVE OF THE STUDY

3.1. General objective

- To assess outcome and Associated factors of adult poisoning cases at Tikur Anbessa specialized hospital from January 1,2015 to December 31 ,2020

3.2. Specific objectives

- To determine the outcome of poisoning cases at TASH
- To determine factors affecting the outcome of poisoning cases at TASH

CHAPTER FOUR

4. METHODS

4.1. Study area and setting

The study was conducted at TASH in Addis Ababa. TASH was opened in 1972 and it has become the university teaching hospital under AAU since 1998. It is the largest tertiary hospital in the nation. The hospital has many clinical departments including emergency medicine, internal medicine, pediatrics, gynecology /obstetrics, general surgery, family medicine, psychiatry, ophthalmology, ENT, dentistry, neurology and other specialty and subspecialty departments. It has a total of 21 specialty departments. TASH has 200 doctors, 379 nurses and 115 other health professionals dedicated to providing health care services. The various departments, faculties and residents under specialty training in the School of Medicine provide patient care in the hospital [25].

Emergency department was established as a separate department in 2008 and currently it has 6 separate working areas. These are triage and front, Red, waiting, orange, yellow and green. Currently ED has 12 consultants, 40 residents and 58 nurses [26].

Addis Ababa is the capital city of Ethiopia and the seat of Africa union. According to 2007census, it has population of 2,739,551. [27].

4.2. Study design and period

Hospital based cross -sectional study design was used and data was collected retrospectively on adult poisoning cases at TASH from January 1, 2015 to December 31, 2020. Data collection was carried out from March 1 to April 30, 2021.

4.3. Population

4.3.1. Source of population

All patients seen at adult emergency department during the study period

4.3.2. Study population

All patients seen at adult emergency department with a case of poisoning during the study period

4.4. Inclusion and Exclusion criteria

4.4.1. Inclusion criteria

All adult patients who were acutely poisoned and presented to emergency department, and admitted to MICU during the study period were included.

4.4.2. Exclusion criteria

Adult patients whose medical records were found to be incomplete, completely lost or misplaced were excluded.

4.5. Sample Size determination

The sample size was calculated by using the formula for single population proportion for cross sectional survey considering the following assumptions: the proportion of discharge rate was 61.2% taken from a one-year study done on pattern of poisoning for patients presented to Jimma University specialized Hospital among 103 patients, 5% marginal error [23] and 95% CI (1.96) was used. Using single population proportion formula, the sample size was

$$n = \frac{z^2 p(1-p)}{d^2}$$

Where: n=sample size from an infinite population

Z= standard deviations corresponding to the **95%** confidence interval =**1.96**

P= proportion among the study population =0.612

d= degree of accuracy required or desired precision (maximum allowable error of the estimate) =**0.05**

$$n = \frac{(1.96)^2 * 0.612(1-0.612)}{(0.05)^2} = 364.$$ It will be **382** (with 5% non-response rate).

But since the number of cases were below the calculated sample size, all records, during the study period, were included.

4.6. Sampling method

Non probability convenience sampling method was used and all adult patients with a case of poisoning who fulfill the inclusion criteria and trailed between the study period were included.

4.7. Data collection

After preparing a structured questionnaire in English, which was prepared using prior literatures with few amendments based on study objectives, cards were collected from the card office by workers in the office. For this purpose, the card numbers in the registration log book were used. The medical record numbers of patients who were admitted from ED to MICU were cross checked to avoid double count. After selecting the cards, the structured formats were filled by trained data collectors and reviewed by the principal investigator (PI). Pretest was done and the necessary modifications were made on the data collection tool based on the findings.

4.8. Data quality assurance

Data was checked for accuracy and consistency by the PI on a daily basis during data collection.

4.9. Data analysis

Data extracted from patient's medical charts were coded, cleaned and the registry was made into computer using SPSS version 26 software program for further analysis. Simple descriptive statistics such as frequencies and percentages were used to characterize the variables. Chi square test was used to explore associations between dependent and independent variables. Odds ratio with 95% confidence interval was computed to assess the level of association and statistical significance. Those variables which were found to be significant in bivariate analysis were retained for further multivariate analysis. Then logistic regression analysis was done to control confounding variables and to predict independent factors associated with outcome. A p-value of < 0.05 was considered to be statistically significant. The analyzed data was described using tables, graphs and figures accordingly.

4.10. Variables

4.10.1. Independent variables

- Socio demographic characteristics
  - Age
  - Sex
  - Place of residence
  - Source of referral
- Triage category
- Causes of poisoning
- Circumstance of poisoning
- Predisposing factors
- Route of exposure
- Average time of presentation from exposure to hospital
- Clinical presentation at time of visit
- Pre hospital intervention by the family
- Type of treatment employed

4.10.2. Dependent variables

- Outcome of adult poisoning

4.11. Operational definitions

Outcome of acute poisoning: in this study outcome of acute poisoning was either discharge or in hospital death

Rural: place of residence for cases that were admitted from areas surrounding Addis Ababa or out of Addis Ababa.

Adult: in this study adult is defined as patients whose age is 13 years and above

Urban: place of residence for cases admitted from the city of Addis Ababa.

Prehospital intervention by family: administration of water, milk and other home remedies.

4.12. Ethical considerations

The study was conducted after it was evaluated by departmental research review board and ethical approval letter obtained from department of Emergency medicine and Critical care. The objective of the study was briefed to the staff of the documentation unit. Documents and Information obtained at each course of study was kept confidential.

4.13. Dissemination of result

The findings of the study will be presented to department of Emergency medicine & Critical care /AAU. Then, copies of the research paper will be submitted to AAU College of health science Emergency medicine & Critical care department. If possible, it will be published on journals as well.

CHAPTER FIVE

5.RESULTS

5.1 Sociodemographic characteristics

During the specified study period, there were a total of 218 acute adult poisoning cases as retrieved from the log book of Emergency department and adult MICU. From 218 patients, 183 Patients have had complete information on their charts and included in this study making the response rate of 83.9%. According to this study, out of 183 patients, 92 (50.3%) of them were females and 91 (49.7%) of them were males. Considering age related variables, the median age of study variables was 27 years (IQR=22years-35 years, maximum age 57 years). most of them were in the range of 21 to 30 years which accounts 75 (41%) followed by the age range of 31 to 40 years accounting 41 (22.4%) and 13 to 20 years accounting 38 (20.8%). With regard to place of residence, 158 (86.3%) of them were from Addis Ababa and the remaining 25 (13.7%) were from out of Addis Ababa. Most of them were self referred which accounts 146 (79.8%).

Table 1: Socio-demographic characteristics of poisoning cases based on outcome at TASH from January 1,2015-December 31,2020.

Characteristics		Outcome	
		Discharge (%)	Death (%)
Age	13-20	32 (84.2)	6 (15.8)
	21-30	61 (81.3)	14 (18.7)
	31-40	37 (90.2)	4 (9.8)
	41-50	15 (100)	0
	≥51	13 (92.9)	1 (7.1)
Sex	Females	74 (80.4)	18 (19.6)
	Males	84 (92.3)	7 (7.7)
Place of residence	Urban	147 (93)	11 (7)
	Rural	11 (44)	14 (56)
Source of referral	Self	135 (92.5)	11 (7.5)
	Government hospital	14 (66.7)	7 (33.3)
	Health center	5 (45.5)	6 (54.5)
	Private hospital	4 (80)	1 (20)

5.2 Poisoning characteristics

Triage category

Most patients were triaged as red which accounts 95 (51.9%) followed by Orange, Yellow and Green which account 38 (20.8%), 26 (14.2%) and 24 (13.1%) respectively. All deaths (n=25) were triaged as Red.

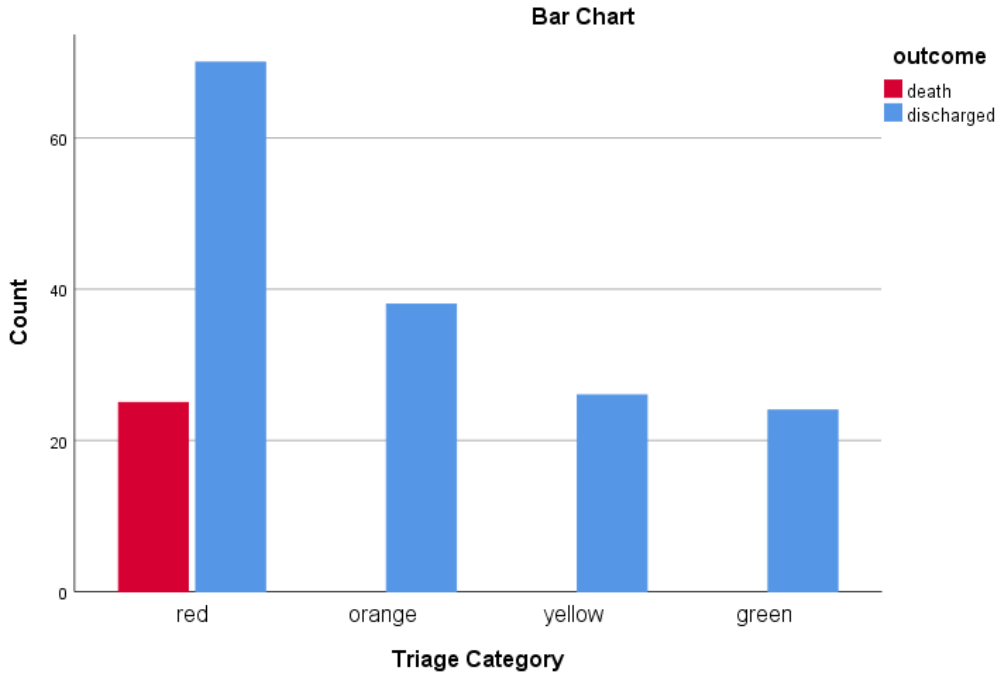

Figure 1:Triage category of poisoning cases at TASH based on outcome from January1,2015-December 31,2020.

Causes of poisoning

The most common type of poison identified was sodium hypochlorite or Berekina which was ingested by 40 patients (21.9%), followed by Alcohol 33 (18%), Rodenticides 22 (12%), Barbiturates 21 (11.5%), organophosphates 20 (10.9%), and carbon monoxide 11(6%) in descending order. Other less common causes of poisoning were Metformin 8 (4.4%), Acetaminophen 8 (4.4%), Opioids 7 (3.8%), antidepressants 5 (2.7%), and Hydrocarbons 4 (2.2%) in descending order. The type of poison was not specified for 4 patients (2.2%). The common causes of death were Rodenticides (n=10), Barbiturates (n=8), and Organophosphates (n=5). Other less common causes were Opioids (n=1) and Antidepressants (n=1).

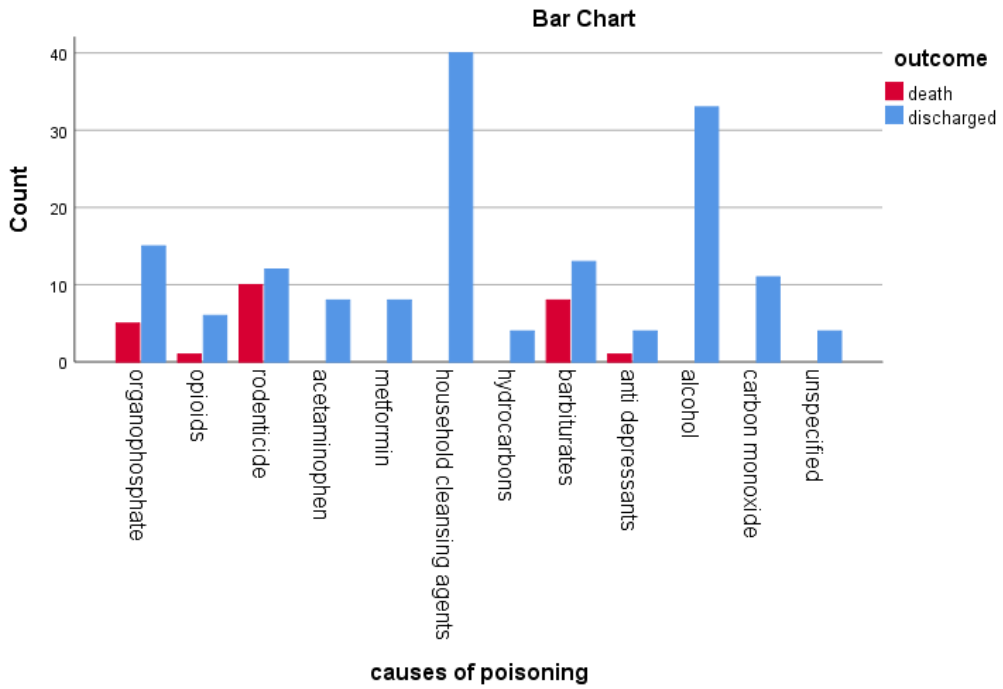

Figure 2: Frequency distribution of common causes of poisoning at TASH based on outcome from January 1,2015 -December 31,2020.

Circumstance of poisoning

Most of the cases were intentional poisoning which accounts 169 cases (92.3%) and the remaining 11 (6%) were accidental and for 3 patients (1.7 %) the circumstance was not documented. Suicidal attempt was more common in males 88 (52.1%) than females 81 (47.9%). All deaths (n=25) were due to intentional poisoning.

Comorbid conditions / underlying reasons for poisoning

The commonest reason for poisoning was social conflict accounting 74 cases (40.4%), followed by substance abuse 30 (16.4%), patients with epilepsy 19 (10.4%), psychiatric illness 13 (7.1%) and exam failure 10 (5.5%) in descending order. Overall, 146 patients (79.8%). The commonest underlying reasons which result in death were social conflict (n=10), Epilepsy (n=8), psychiatric illness (n=2), exam failure (n=1), and substance abuse (n=1) in descending order. Three deaths were from unspecified underlying reason.

Table 2: Underlying reasons for poisoning cases based on outcome at TASH from January 1,2015-Deceber 31,2020.

Underlying reason	Discharge (%) *	Death (%) *
Social conflict	64 (86.5)	10 (13.5)
Substance abuse	29 (96.7)	1 (3.3)
Epilepsy	11 (58)	8 (42)
Psychiatric illness	11 (84.6)	2 (15.4)
Exam failure	9 (90)	1 (10)
Unspecified	34 (91.9)	3 (8.1)
Total	158 (86.3)	25 (13.7)

*the percentages are within outcome

Route of exposure

There were only two routes of exposure. In 172 cases (94%) the route of exposure was through ingestion and the remaining 11 (6%) cases were inhalational exposures. All deaths (n=25) were from ingestion.

Time of presentation to hospital after poisoning

The median time from poison exposure to hospital presentation was 2 hours (IQR 30minutes-6 hours, maximum 96 hours). Hundred six (57.9%) of cases presented to hospital within 24 hours, 62 cases (33.9%) of cases arrived within 1 hour and the remaining 15 (8.2%) of cases arrived after 24 hours. Most deaths (n=11) occurred for those who arrived after 24 hours.

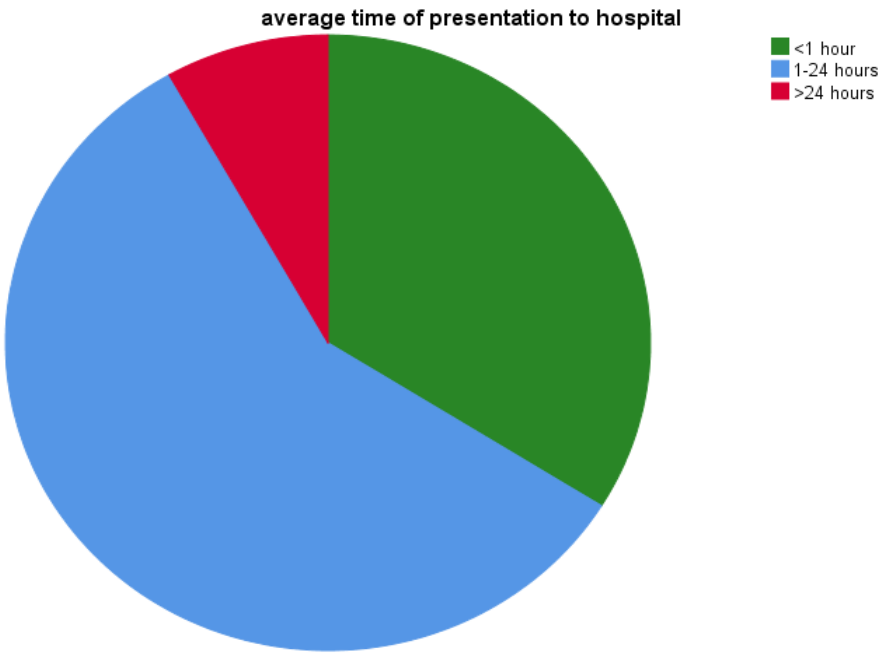

Figure 3: Frequency distribution of poisoning cases at TASH based on time of presentation from exposure to hospital from January 1,2015 -December 31,2020.

Clinical presentation of poisoning cases

The commonest presentations were altered consciousness 67 (36.6%), epigastric pain, diarrhea & vomiting 30 (16.4%), diarrhea & vomiting 26 (14.2%), and epigastric pain 20 (10.9%).

Table 3: Frequency distribution of main clinical presentations of poisoning cases at TASH from January 1,2015-December 31,2020.

Main presenting complaint	Frequency (%)
Altered consciousness	67 (36.6%)
Epigastric pain, diarrhea & vomiting	30 (16.4)
Diarrhea & vomiting	26 (14.2)
Epigastric pain	20 (10.9)
Altered consciousness, epigastric pain, diarrhea & vomiting	16 (8.8)
Altered consciousness & headache	7 (3.8)
Headache	5 (2.8)
Diarrhea, vomiting, excessive salivation & urination	4 (2.2)
Breathing difficulty	2 (1.1)
Hypotension	2 (1.1)
Bleeding	2 (1.1)
Diarrhea, vomiting & headache	1 (0.5)
Excessive sweating, salivation & urination	1 (0.5)
Total	**183 (100%)**

Prehospital intervention

One hundred sixty- five patients (90.2%) did not receive prehospital intervention by family and the remaining 18 cases (9.8%) received prehospital treatment. All deaths (n=25) did not receive prehospital treatment.

Main Managements employed

Most patients were managed with fluid resuscitation, PPIs and antiemetics (46.4%), fifteen patients (8.2%) of patients received specific antidotes as the main management.

Table 4: Frequency distribution of main managements employed for poisoning cases at TASH from January 1,2015 -December 31,2020.

Main management employed	Frequency (%)
Fluid resuscitation, PPIs and antiemetics	85 (46.4)
Fluid resuscitation	19 (10.4)
Antidotes (vitamin K1, atropine &naloxone)	15 (8.2)
Oxygen	11 (6.0)
Other medications* other than antidotes	10 (5.5)
GI-decontamination & specific antidotes	9 (4.9)
Hemodialysis	9 (4.9)
Tracheal intubation	9 (4.9)
GI-decontamination	9 (4.9)
Hemodialysis & tracheal intubation	7 (3.8)

*other medications to mean analgesics, PPIs & antiemetics

Outcome

Most patients were discharged from ED (n=144) of which 49 patients were linked to psychiatry clinic and 6 patients were linked to neurology referral clinic, one patient was referred out due to lack of MICU bed but the remaining 88 patients were directly discharged home from ED. There were 17 deaths at ED making ED case fatality rate of 17/161(10.56%). Twenty- two patients were admitted to MICU of which 8 cases died and 14 cases discharged which makes MICU case fatality rate of 8/22 (36.36%). There was no information whether MICU discharged patients were linked to referral clinics or not. The overall discharge rate was 158/183 **(86.3%)** and the overall case fatality rate was 25/183**(13.7%).**

Table 5: Frequency distribution of outcome for poisoning cases at TASH from January 1,2015 -December 31,2020.

	Discharge (%)	Death (%)	Total (%)
ED	144 (89.44)	17 (10.56)	161 (88)
MICU	14 (63.64)	8 (36.36)	22 (12)
Total (%)	158 (86.3)	25 (13.7)	183 (100)

5.3 Factors associated with outcome

Initially different variables such as age, sex, place of residence, source of referral, triage early warning score, causes of poisoning, circumstances of poisoning, underlying reasons for poisoning, route of exposure, average time of presentation, clinical presentation, prehospital treatment, and management employed were considered for bivariate analysis. In the bivariate analysis, the following variables showed statistically significant association with the outcome: Being male (COR=2.919,95%CI=1.155-7.378, P=0.024), Place of residence from Addis Ababa (COR=17.008, 95% CI= 6.260-46.209, P=0.000), time of arrival within 1 hour (COR=31.350,95%CI=7.247-135.624, P=0.000), time of arrival within 1-24 hours (COR=29.639, 95%CI=7.818-112.366, P=0.000), underlying reason being Epilepsy (COR=0.121, 95%CI=0.027-0.539, P=0.006), Management with intubation (COR=16.0 ,95%CI=1.315-194.623, P=0.030). These variables were taken and analyzed together using multivariate logistic regression model.

After controlling for the effects of potentially confounding factors using multivariate logistic regression model, place of residence and management with intubation were found to be statistically significant predictors of outcome. Relative to rural, being from urban place of residence was strongly associated with discharge (AOR=6.384, 95%CI=1.270-32.098, P=0.024). Relative to other main management options, need for intubation was associated with less chance of discharge (AOR=0.045,95%CI=0.003-0.776, p=0.033).

Table 6:Relationship between sociodemographic and poisoning characteristics with outcome for poisoning cases at TASH from January 1,2015-December 31,2020.

Variables		Outcome		COR (95% CI)	AOR (95%CI)	P - value
		Discharge (%)	Death (%)			
Sex	male	84 (92.3%)	7 (7.7%)	2.919(1.155-7.378)	0.557(0.115-2.702)	0.467
	female	74 (80.4%)	18 (19.6%)	1.00(reference)		
Place of residence	Rural	11 (44%)	14 (56%)	1.00 (reference)		
	Urban	147 (93%)	11 (7%)	17.008 (6.260-46.209)	6.384(1.270-32.098)	0.024*
Time of arrival	<1hr	57(91.9%)	5(8.1%)	31.350(7.247-135.624)	3.016(0.199-45.791	0.426
	1-24 hr.	97 (91.5%)	9(8.5%)	29.639(7.818-112.366)	12.833(0.925-177.932)	0.057
	>24hrs	4 (26.7%)	11 (73.3%)	1.00 (reference)		
Underlying reason	Psychiatric illness	11 (84.6%)	2 (15.4%)	0.485(0.072-3.290)	0.339(0.025-4.547)	0.414
	Substance abuse	29 (96.7%)	1 (3.3%)	2.559(0.252-25.954)	2.195(0.127-37.859)	0.588
	Epilepsy	11 (57.9%)	8 (42.1%)	0.121(0.027-0.539)	1.706(0.106-27.552)	0.706
	Social conflict	64 (86.5%)	10 13.5%)	0.565(0.146-2.191)	1.214(0.172-8.581)	0.846
	Exam failure	9 (90%)	1 (10%)	0.794(0.074-8.576)	5.104(0.149-174.584)	0.366
	Unspecified reason	34 (91.9%)	3 (8.1%)	1.00(reference)		
management	Specific antidotes	10 (66.7%)	5(33.3%)	4.000(0.385-41.511)	0.299(0.025-3.582)	0.340
	Fluid resuscitation	18 (94.7%)	1 (5.3%)	0.444(0.025-8.031)	1.528(0.074-31.651)	0.784
	intubation	3 (33.3%)	6(66.7%)	16.000(1.315-194.623)	0.045(0.003-0.776)	0.033*
	Dialysis	8 (88.9%)	1 (11.1%)	1.000(0.053-18.915)	4.035(0.092-176.596)	0.469
	Fluid & other medication	81(95.3%)	4(4.7%)	0.395(0.039-3.974)	1.875(0.173-20.287)	0.605
	GI-decontamination & specific antidotes	8 (88.9%)	1 (11.1%)	1.00 (reference)		

*p-value <0.05 -statistically significant

CHAPTER SIX

6. DISCUSSION

In this study the overall case fatality rate was 13.7% and the overall discharge rate was 86.3%. Urban place of residence & management with intubation were independent predictors of outcome.

The overall case fatality rate in this study was 13.7% which was higher as compared to a study done in similar study area (8.6%) [19], JUSH (5.8%) [23], Ambo (1.5%) [18], Adama (1.37%) [24], Dares Salaam (0.9%) [22], south Africa (2.4%) [3], and China (1.3%) [21]. This difference might be due to an increase in referral of critical patients from the periphery, the differences in specific causes of poisoning and difference in study area and set up. The overall discharge rate in this study was 86.3% which was higher than a study done at JUSH (61.2%) [23]. Psychiatry department consultation was made for 34% (49/144) of discharged patients at ED which was higher as compared to a study done in similar study area (17.2%) [19] and JUSH (8.7%) [23]. The difference might be due to availability of psychiatry department. But 61.1% (88/144) of discharged patients were directly sent home from ED without consultation to referral clinics (Psychiatry and neurology) which was higher than a study done in Dares Salaam (6.6%) [22].

Majority of the cases were represented by females (50.3%) like that of a study done in south Africa (57.8%) [3], study done in JUSH (52.4%) [23], and study conducted in the same hospital (64.6%) [19]. The most affected age group was in the age range of 21-30 years (41%) which was higher than a study done at Adama (39.5%) [24] but lower than a study done at Ambo (50.7%) [18]. This difference might be due to difference in study areas. Most of the cases were from Addis Ababa (86.3%) which is almost consistent with a previous study in the same hospital (89.6%) [19].

Sodium hypochlorite (household cleansing agent) was the commonest cause of poisoning (21.9%) which was lower as compared to a study done in south Africa (45.7%) [3], JUSH (41.7%) [23], and similar hospital (43.1%) [19]. Alcohol (18%) and rodenticides (12%) were

the 2nd and 3rd commonest causes of poisoning in this study. CO poisoning was observed only in urban residents which similar with a study done in Adama [24].

Considering circumstance of poisoning, most (92.3%) were intentional poisoning like a study done in Nepal (97%) [1], Dares Salaam (59.4%) [22], JUSH (50.5%) [23], Ambo (76.9%) [18], and similar hospital (96.6%) [19]. Males were more likely to attempt suicide (52.1%) which was higher as compared to a study done in Nepal (34%) [1], and south Africa (31.3%) [3]. These differences might be due to differences in study area and sociocultural practices.

Social conflict was the commonest reason for poisoning (40.4%) which was higher than a study done at Ambo (35.9%) [18] but lower than a study done in JUSH (75.9%) [23], and similar hospital (TASH) (57%) [19]. Substance abuse (16.4%), patients with epilepsy (10.4%), psychiatric illness (7.1%) and exam failure (5.5%) were other reasons in descending order. Overall, 79.8% of patients specified their reason for poisoning.

Ingestion was the commonest rout of exposure (94%) which is almost comparable with a study done at JUSH (94.25%) [23] and slightly higher than a study done in china (86.2%) [21]. Inhalational poisoning occurred in 6% of the cases which is almost similar with a study done in JUSH (5.75%) [23]. These differences might be due to the difference in the type of substances used for poisoning.

Most cases (57.9%) arrived within 1-24 hours which shows there is a delay in arrival as compared to a study done in JUSH (54.2% arrived within 30minutes-1 hour) [23], Ambo (all of them arrived within 5 hours) [18], and similar study area (94.3% arrived within 12 hours) [19]. This difference might be due to an increase in referral from the periphery and traffic overcrowding in the city.

The most common clinical presentations were altered consciousness (36.6%), epigastric pain, nausea & vomiting (16.4%), diarrhea & vomiting (14.2%) and epigastric pain (10.9%) in descending order. According to a study done in similar study area, the commonest presentations were altered consciousness (46.2%), vomiting (23.8%), and epigastric pain (22.5%) in descending order [19]. A study done in JUSH diarrhea & vomiting (49.5%), altered consciousness (16.5%), and epigastric pain (13.6%) [23]. These differences might be due to differences in the specific causes of poisonings and time of presentation.

Prehospital treatment was given for 9.8% of patients which was lower as compared to a study done in similar study area (23.3%) [19]. All deaths (n=25) did not receive prehospital treatment but prehospital treatment has no statistically significant relationship with outcome which is similar with a study done in similar study area [19].

Most patients were managed with fluid resuscitation, PPIs & antiemetics (46.4%).GI-decontamination was performed only for 4.9% of patients which was lower than a study done in Adama (56.6%) [24], JUSH (78.6%) [23], China (72.5%) [21]. According to a study done in china, 64.8% of patients received activated charcoal [21] but in this study no patient received activated charcoal for GI-decontamination. The low performance of GI-decontamination in this study might be due to delayed presentation of patients. Specific antidotes were administered for 8.2% of patients which was lower as compared to a study done in JUSH (12.6%) [23], Adama (37.8%) [24]. The difference in use of specific antidotes might be due to the difference in the specific types of poisonings and availability of antidotes. Oxygen was used as the main management option for 6% of patients which was higher than a study done in Adama (1.7%) [24]. This difference might be due to the number of patients who were poisoned by CO relative to sample size. Hemodialysis was done for 4.9% of patients which was lower as compared to a study done in China (7.7%) [21]. This difference might be due to the specific causes which needed hemodialysis and availability of hemodialysis service.

This study found out that relative to rural, being from urban place of residence was strongly associated with discharge or patients who came from rural areas were high likely to die as compared to those of who were from Addis Ababa. This could be due to the fact that patients who lives in urban can easily access the hospital and get treatment early and patients who came from rural area might be more critical.

Relative to other main management options, patients who required intubation were less likely to be discharged or intubation was strongly associated with death. This might be due to the fact that patients who had indication for intubation might be more critical and had less chance of survival as compared to those who did not require intubation. The other reason might be due to poor close follow up and care in MICU for intubated patients.

CHAPTER SEVEN

7. LIMITATION AND STRENGTH OF THE STUDY

7.1 Limitation of the study

This was a hospital based single cross-sectional study with retrospective chart review that may not establish trends and causality between outcome and potential risk factors. The retrospective nature of the study prohibited us from collecting detail clinical and laboratory data to determine the severity of the cases and to calculate poisoning severity index (PSI) as a determinant of outcome. The medical records of the studied patients lack completeness and uniformity which makes study variables incomplete.

7.2 Strength of study

The objective of this study was to assess outcome and associated factors, which is a new study to this particular study area that will provide new information. So, the findings of this study will serve as a baseline to do further study. The findings of this study also identified gaps and potential intervention areas for management of poisoning cases to the hospital and FMOH.

CHAPTER EIGHT

8. CONCLUSIONS AND RECOMMENDATION

8.1 Conclusion

In this study the overall case fatality rate was 13.7% which was very high as compared to the findings of other studies. The commonest cause of poisoning in this study was household cleansing agent. The commonest causes of death were ingestion of Rodenticides, Barbiturates and Organophosphates in descending order. GI-decontamination and specific antidotes were given for only few patients. Most deaths occurred in those patients who arrived after 24 hours. The independent predictor for death was a need for intubation and the independent predictor for discharge was being from Addis Ababa.

8.2 Recommendations

Complete recording of patient related information and record keeping process should be improved. As majority of patients poisoned for intentional self-harm purposes, linkage to appropriate mental health service is recommended.

The hospital should work on availability of specific antidotes and MICU patient care. Awareness on proper handling of chemicals should be forwarded to users of these agents by public health workers. Ambulance service and facilitation of early referral of critical patients should be improved.

Prospective study has to be done to predict the factors contributing to poor outcome with the incorporation of poisoning severity index score and laboratory related factors. Further largescale studies are required to investigate national trends of poisoning and factors associated with poor outcome.

CHAPTER NINE

9. REFERENCES

1. A comparative retrospective study of poisoning cases in central, zonal and district Hospitals Kathmandu University Journal of science, Engineering and technology vol. I, No v September 2008, PP 40-48
2. Klassen CD (2008). Toxicology: the basic science of poisons.7th ed. USA: Mc Graw Hill.
3. Malangu N, Ogunbanjo GA (2009). A profile of acute poisoning at selected hospitals in South Africa.SouthAfricanJournal of Epidemiology Infection, 24:4-16
4. Nhachi CFB Casilo OMJ. Household chemical poisoning admissions in Zimbabwe`s main urban centers. Hum Exp Toxicol1994; 13:69-72.
5. Goodman and Gilman`s: The pharmacological basis of therapeutics, 11th edition, 2005, p201-210.
6. Wesseling C McConnel R, Partanen T, Hogstedt C. Agricultural pesticide use in developing countries: health effects and research needs. Int J Health Services 1997; 27:273-308.
7. khan MM Reza H. benzodiazepine self poisoning in Pakistan: implications for prevention and harm reduction JPMA1998; 48:293-5.
8. Islambulchilar M, Islambulchilar Z, Kargar-Maher H (2009). Acute adult poisoning case
9. Zae A, Baa M (2014). Pattern of acute poisoning in Al Majmaah region, Saudi Arabia.American Journal of Clinical and Experimental Medicine 2(4):79-85.
10. Moazzam M, Al-Saigul AM, Naguib M, Alfi MA (2009). Pattern of acute poisoning in AL Qassim region: a surveillance report from Saudi Arabia, 1999-2003. East Mediterr Health J 15:1005-10
11. Banerjee I, Tripathi SK, Sinha Roy A (2012). Clinico-epidemiological characteristics in OP poisoning. North American Journal of Medical Sciences 4:
12. Bundotich JK, Gichuhi M (2015). Acute poisoning in the Rift Valley Provincial General Hospital, Nakuru, Kenya: January to June 2012. S AfrFam Pract 56:1–5.

13. Ahmadi A, Pakravan N and Ghazizadeh Z (2010). Pattern of acute food, drug, and chemical poisoning in Sari City, NorthernIran.Hum Exp Toxicol 29(9):731–738.
14. Centers for disease control and prevention of poisoning in USA, 2010.
15. Unnikrishnan B, Singh B, Rajeev A (2005). Trends of acute poisoning in south Karnataka.Kathmandu University Medical Journal 3:149-154.
16. ShoaibZaheer M, Aslam M, Gupta V, Sharma V, Khan SA (2009). Profile of poisoning cases at a North Indian Tertiary Care Hospital.HPPI 32: 176–83.
17. Malangu N (2008a). Characteristics of acute poisoning at two referral hospitals in Francistown and Gaborone.SAFAM Pract 50:67.
18. Mekonen G, Getachew L (2020). Prevalence, predictors, and treatment outcome of acute poisoning in western Ethiopia. open access emergency medicine Dove press journal 12:365-375
19. Desalew M, Aklilu A, Amanuel A, Addisu M, Ethiopia T (2011). Pattern of acute adult poisoning at Tikur Anbessa specialized teaching hospital: A retrospective study in Ethiopia. Hum Exp Toxicol 30:523-27.
20. World Health Organization (2014). Poisons information, prevention and management, Geneva.
21. Zhang Y, Yu B, Wang N, et al. Acute poisoning in Shenyang, China: a retrospective and descriptive study from 2012 to 2016. BMJOpen2018; 8: e021881. doi:10.1136/bmjopen-2018-021881
22. Mbarouk et.al. patients with acute poisoning presenting to an urban emergency department of a tertiary hospital in Tanzania.MBC Res Notes (2017) 10:482
23. Teklemariam E, Tesema S, Jemal A.Pattern of acute poisoning in Jimma University Specialized Hospital, South West Ethiopia.World J Emerg Med 2016;7(4):290–293
24. Chala TS, Gebramariam H, Hussen M. Two-Year Epidemiologic Pattern of Acute Pharmaceutical and Chemical Poisoning Cases Admitted to Adama Hospital Medical College, Adama, Ethiopia. Asia Pac J Med Toxicol 2015; 4:106-11.
25. http://www.aau.edu.et/index.php/about/history-of-aau
26. https://isaem.net>emergencymedicineinethiopia
27. https://en.wikipedia.org>wiki>addis

Annex I - Data collection format

I. Socio-demographic questions

1. MRN _____
2. *Age* _____
3. Sex Male ☐ Female ☐
4. Place of residence urban ☐ rural ☐
5. Source of referral _____

II. Poisoning Characteristics

1. Triage category _____
2. Causes of poisoning (specify amount)

    i. Organophosphates
    ii. Household cleansing agents
    iii. Hydrocarbons
    iv. Drugs
        - Barbiturates
        - Antidepressants
        - Benzodiazepines
        - Others (specify)
    v. Alcohol
    vi. Carbon monoxide
    vii. Other (specify) _____

3. Circumstances of poisoning

viii. Intentional

ix. Accidental

x. Unspecified

4. Any Co morbid conditions/underlying reasons for poisoning

i. Psychiatric illnesses (specify follow up status)

ii. Substance abuse

iii. Epilepsy (specify follow up status)

iv. Social conflict (family, marital)

v. Exam failure

vi. Others (specify) _____

5. Route of exposure

i. Oral ingestion

ii. Through eye

iii. Through skin (cutaneous)

iv. Inhalation

v. Others (specify) _____

6. Average time of presentation to hospital after poisoning

i. Within 1 hour

ii. 1-24 hours

iii. > 24 hours

7. Clinical presentation

i. Altered consciousness

ii. Epigastric pain

iii. Diarrhea/vomiting

iv. Excess sweating/urine/saliva

v. Fever

vi. Breathing difficulty

vii. Headache
viii. Hypotension
ix. Others (specify) _____

8. Pre hospital treatment given? (specify if any) _____
9. Approaches employed in the management at ED
    i. GI decontamination (specify) _____
    ii. Specific antidote given(specify) _____
    iii. Other medications other than antidote (specify) _____
    iv. Fluid resuscitation _____
    v. Intubation _____
    vi. Hemo dialysis _____
    vii. Other interventions (specify) _____

10. Outcome
    i. Discharged home at ED or MICU _____
        Specify referral linkage (if any) _____
    ii. Died at ED or MICU _____

Declaration by investigator

I the undersigned student declare that this is my original work on the title of "Outcome and Associated factors of adult poisoning cases at Tikur Anbessa specialized hospital" and has not been presented in this or any other university and all sources of materials used for this thesis have been duly acknowledged.

Name of the investigator	Signature	Date
Dr. Belayneh Dessie		

Place: AAU, college of health sciences, department of Emergency medicine &Critical care

Declaration by advisors

This thesis has been submitted to AAU, college of health sciences, Department of Emergency medicine & Critical care with my approval as University advisor/s.

Name of advisor/s Dr. Sofia Kebede Dr. Birhanu Tesfaye

Signature _____ _____

Date _____ _____

Place: AAU, college of Health Sciences, department of Emergency medicine & Critical care