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**SCHOOL OF MEDICINE**

**DEPARTMENT OF EMERGENCY MEDICINE**

ASSESSMENT OF PREVALENCE AND OUT COME OF SNAKE BITE AMONG  
PATIENTS ATTENDING AT ABDURAFIE TOWN A GOVRNMENTAL HEALTH  
CENTER AND MSF (NGO'S) NORTH WEST;GONDAR, ETHIOPIA,2014 GC.

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## ABSTRACT

**Background:**-Snake bite is found in worldwide that environmental and occupational hazard causes a potential life threatening medical emergency and, it needs high priority assessment and treatment. It is a greater burden in low and middle income country. Globally snakebites (envenoming's) is a substantial cause of mortality and morbidity across all age groups. The incidence has been estimated as 500,000 and mortality reaches up to 125,000. The largest numbers of fatal snakebites occur in South Asia and Africa. In South Asia, there are 30,000–50,000 deaths each year and in India With approximately 10,000 deaths occurring snake bite per year(1).

**Objective:**-To assess the prevalence and the outcomes of snakebite patients attending at Abdurafie town a governmental Health center and MSF Holland, From January 2011-December 2014 GC. North West; Gondar, Ethiopia.

**Methods and materials:**- Institutional based retrospective; descriptive, cross-sectional study design will be conducted at Abdurafie town Health facilities North West, Gondar, Ethiopia; from January 2011 to December 2014 . All Snake bite patients who fulfill inclusion criteria that complete medical record registrations and visited during the study period. Data were collected by using prepared observational checklist through reviewing of patient chart. The collected data were encoded to Microsoft Excel and analyzed( SPSS) version 20.0. Frequency were generated and used binary logistic regression and chi square test the association between categorical variables.

**RESULT:**-Predominantly males 408/358 (87.7%) were as 12.3% females affected .Majority of the victims attacks at the age groups of 21-30 (48.8%); 94.6% Urban areas peoples who had predominantly affected. 283 (64.9%) and 74 (18.1 %) were bitten outdoors and bitten indoors respectively. The lower limb frequently bite 57.8%) followed by the upper limb 31.1%. Among those poisonous snake bite 86.0% were 69.9 % received polyvalent Anti snake venom (ASV). The incidence of snake bite patients and 17.6% were referred to higher hospital. high; majority 74.0% patients improved and discharged, The mortality rate of snake bite patients were very high 4.9%. However three case(0.3%) corrective finger amputations were done.

**Conclusion:**-A high prevalence of snake bites with high morbidity and mortality especially among the very active fertile youth segment in Abdurafie town a governmental health center and MSF NGO'S, North West; Gondar, Ethiopia.

**Key words:**- prevalence ,Snake bite, anti snake venom, envenomation, squeals, Abdurafi Town.

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## LISTSOF ABBREVIATIONS

TAT.....	TetanusAnti toxoid.
ASV.....	Anti-snake venom
ETB.....	Ethiopian Birr
GBD.....	Global burden disease.
HC .....	Health centres
ICD .....	International classifications of diseases
MOH.....	Ministry of Health
MSF .....	Medicine san frontier's
NTD.....	Neglected tropical diseases
NGO.....	None governmental organization
PI .....	Principal Investigator
SB.....	Snake bite
WHO.....	World Health organization
WB .....	World Bank.
UNDP .....	United Nations Development Programme.

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# CHAPTER ONE

## BACKGROUND

### 1.1. INTRODUCTION

Snake bite is a worldwide environmental and occupational hazards which causes a potential life threatening medical emergency. Venomous snakes are found throughout most of the world (including many oceans), except for a few islands, frozen environments, and high altitudes(1). Snake bite is one of the most neglected public health issues in poor rural communities living in the tropics. Based on World Bank 2005 report, there could be globally, 421,000- 1,841,000 envenomings with 20,000- 94,000 deaths and about 100,000 of these develop severe sequelae occur each year due to snakebite, where higher burden of snakebite and death occurred in South east Asia and in sub-Saharan Africa [1,2].

The global burden of snakebite the researchers estimate that, worldwide, at least 421,000 envenomings and 20,000 deaths from snakebite occur every year. These figures may be as high as 1,841,000 envenomings and 125,000 deaths [2]. Based on the fact that envenoming occurs in about one in every four snakebites, between 1.2 million and 5.5 million snakebites could occur per annum. Their estimates also indicate that the highest burden of snakebite envenomings and death occurs in South and Southeast Asia and in sub-Saharan Africa, and that India is the country with the highest annual number of envenomings (81,000) and deaths (nearly 11,000) [4,5]. Snakebites have been considered a neglected disease by the World Health Organization (WHO). The distributions of venoms and non-venomous snakes are worldwide. There are more than 3000 species of snakes in the world but only about 350 are venomous. Snake bite is a common problem in the world the common snake species that attacked Human beings are grouped in three families; the venomous snake bite has a medical emergency that needs appropriate management. It depends up on their species various potency and toxicity actions. The commonest human poisonous species of snakes were identified in to three families [7,]. Elapid (cobra, king Cobra, krait and coral snakes), Viperida (Vipers):- The head is triangular in shape wider than the neck. Moveable, & canalized like hypodermic needle. And Hydrophidae (Sea snake), the sea snake found in the water, they have a small head and a flattened tail that helps to swim [7,8].

Snake venom characterized very complex mixture of enzymes, low molecule weight, polypeptide polyproteins and metallic ions. The enzymes and polypeptide are affects the human



body in multi system fashion among these the deleterious components are hemorrhages, that renders the vasculature leakage and these can cause both local and systemic bleeding. Snake bite millions of people annually creating one of the neglected health problems of the tropics due to a lack of ant venoms, Contributing to this in developing nations, there is also deficiencies in the management of complications, transportation, hospital equipment's and public knowledge of appropriate first aid, which result in a mortality rate one hundred fold higher than in developed countries, The victims of snake bites are mainly of the rural population, who are bitten during field work and when sleeping outdoors Snake bite remains a public health problem in many countries even though; it is difficult to be precise about the actual number of cases. It is estimated that the true incidence of snake envenomation could exceed by five folds million per year[10].

Clinical features of snake bite that evidence that needs for immediate management of envenomation's snake bite infusion administrations of Antivenom evidences are based on local or systemic manifestations such as; Neurotoxicity, systemic toxicity including hypotension and shock; neurotoxicity, coagulopathy, rhabdomyolysis ,persistent hypotension ,coagulopathy and local tissue necrosis. Snake venoms are a mixture of complex toxins that may be independent, synergistic or antagonistic. The major groups of toxins are: neurotoxins, myotoxins, haemotoxins and nephrotoxins. It is important to understand that the actual mixture of toxins in the venom could be vary by individual species and also by age and season[26].Snake bite millions of people annually creating one of the neglected health problems of the tropics due to a lack of ant venoms. Contributing to this in developing nations, there is also deficiencies in the management of complications, transportation, hospital equipment's and public knowledge of appropriate first aid, which result in a mortality rate one hundred fold higher than in developed countries. The victims of snake bites are mainly of the rural population, who are bitten during field work and when sleeping outdoors, Snake bite remains a public health problem in many countries even though; it is difficult to be precise about the actual number of cases[10,18].The only specific anti dote to the toxins snake venom is hyper immunoglobulin from an animal that has been immunized with appropriate venom approved in 1895[30].

## **1.2 STATEMENTS OF THE PROBLEMS**

The distribution of snakes are worldwide, especially in warm & low land areas including the proposed study area and SB is a common occupational and environmental public health problems which can inflict much morbidity and occasional it can be fatal. In sub-Saharan Africa, recent estimates suggest that per year about 1 million bites by venomous snake occurred, with 100,000 to 500,000 cases of envenomation's and up to 30,000 deaths per year and 12,000-14,000 amputation. Populations in these regions face high morbidity and mortality due to the poor access to health services [5,7].

Although there are studies related to snake bite prevalence & its outcomes in the world, there are no relevant data particularly for our country, Ethiopia and in the proposed study area that are the more remote and hot weather conditions. I heard about a number of people died from snake bite, some developed partial or complete impairment of physical, psychological as well as social sequelae & I noticed snakes that had different colors, sizes & shapes of snakes.

As literatures shown most of the individuals affected groups are those who are leading their life on agricultural & related works and most of the rural community are the exposed ones to snake bite. These highly risk group of populations are not aware of modern or scientific techniques of the possible preventive and control measure of the problems. As to my knowledge there are no accessibility and availability of adequate antivenom medications provided at health facilities that are found in a high risk areas, such as the case in the proposed area. When I was seen a number of snake bite patient flows were comes with referred to Gondar university hospital from Abdurafie town health center and MSF Holland due shortage of Anti venom. when I employed and worked there. There is a limitations of research regarding snake bite prevalence and its outcomes and impacts in Ethiopia and this problem should be given a priority as an emergency management. Due to these facts the motives arises to study snake bite epidemiology.

### **1.3 SIGNIFICANCE OF THE STUDY**

The importance of the study is that both for the community and health institutions. To encourage better health service delivery system in the study area and to evidence for a possible preventable measure had been taken, also to decrease the epidemiology of acute and chronic complications of snake bite and also to reduce the prevalence of snake bite victims, to treat patients who had developed severe sequelae secondary to snake bite. Another important for the study is that better to a preliminary study reference for secondary data analysis further research should be easy to be done. In addition to these to address for institutions for research reference, to create awareness for extension health workers how to control prevent snake bite and its first aid management addressed to highly risk native peoples.

## CHAPTER TWO

### LITRATURE REVIEW

Worldwide estimation; Global Burden of Disease 2005 study report (Global Burden Project of the World bank). That estimate the incidence rate is that globally, around 421,000 envenoming's and 20,000 deaths occur each year due to snakebite. These figures may be as high as 1,841,000 envenoming's and 94,000 deaths. Based on the fact that envenoming occurs in about one in every four snakebites, between 1.2 million and 5.5 million snakebites could occur per year [2,3]. Their estimates also indicate that the highest burden of snakebite and death occurs in South east Asia and in sub-Saharan Africa, The largest numbers of fatal snakebites occur in South Asia and Africa. In SouthAsia, there are 25,000–30,000 deaths each year from snakebite. , and that India is the country with the highest annual number of envenoming's (81,000) and deaths (nearly 11,000). Snakebites have been considered a neglected disease by the World Health Organization (WHO). India's first national survey of the causes of death, the Million Death Study, undertaken in 2001-2003 by the Registrar General of India and the Centre for Global Health Research gives an estimate of 46,000 annual deaths by snakebite[1,2].

The number of snake bite envenoming's varying from region to regions. WHO reports that Over 90% of these fatalities occur in two continents i.e. Africa and Asia; that conservative estimate, the highest number of envenoming's were estimated for South Asia (121,000) followed by South east Asia (111,000), and East Sub-Saharan Africa (43,000). in India the most envenoming's at 81,000 per year. Sri Lanka (33,000), Viet Nam (30,000), Brazil (30,000), Mexico (28,000), and Nepal (20,000) were the other countries that had a high estimated number of envenoming are annually [16,17].

Outcomes of snake bite permanent physical sequeale, social and psychological insult and a greater burden of morbidity&mortality in low and middle income countries. The study was conducted Two hundred and seven (207) cases of snakebite admitted at the State Specialist Hospital Gombe Mustapha, Nigeria , a 4-year period were retrospectively studied was done in 2003. The highest proportion age group was in the 21-30 years age group accounting for 36.9% of the total. There is a male preponderance with a male to female ratio of 6: 1. Most of the victims were bitten outdoors (75%). The lower limb was the most frequently bitten site (68.1%). The highest number of bites (77.3%) occurred during the rainy season, with farmers accounting

for 64.2% of cases. 92% of the bites occurred during the day. Systemic envenomation was noted in 46.4% of the victims. 96.6 % of them received polyvalent antivenom, while 89.5% and 78.4% received antibiotics and antitetanus prophylaxis respectively. The mortality rate was 10.6% [15,,21,22].

Another retrospective crosssectional study was done in Kogi State Specialist Hospital, Lokoja, and Nigeria, in 2002. A sum total of six hundred and sixty-six patients were admitted to the medical wards of the hospital during the period in question out of which fifteen cases of snake bite were recorded. This represents only 2.25% of the total admission on the medical wards during the study period. In this study were able to retrieve the full medical records of only twelve (12) patients for full analysis and review. Majority of the patients (11 to 73.3%) were male while only four (26.7%) were of the female gender. The mean age of the patient was 34.3 years ( $\pm 1.9$ ). In all cases, the snake bite affected the lower limbs with the left foot being affected in seven cases and the right in five. Five of the affected patients were bitten during the months of the rainy season (May to October) while the remaining seven patients had their episodes during the months of the dry season (November to April). Majority of the patients (75%) were attacked during the evening or at night. No mortality was recorded among the fifteen patients seen during the study period [15,21].

Administration of anti-snake venom was carried out in eleven patients (91.7%), while five patients had fresh whole blood transfused. The Pasteur anti-venom was administered in ten patients (83.3%). A study conducted a total of 130 cases of snakebites had presented to the south India hospital emergency department during the study period 2008. Seventy-six patients [46 (60.52%) male, 30 (39.47%) female] satisfying the inclusion criteria were included in the present study. The rest of 54 cases had no signs of envenomation and were discharged after 24 hours. All the patients were in the age range of 16 to 82 years, with 61% cases below 50 years age. Occupationally, male agriculture worker 41(53.95%) were most affected followed by housewives 15 (19.74%) and students 7 (9.21). Most of the cases occurred during the month of June to December. Seventy-five percent of patients were bitten between 6 PM to 12 AM, whereas 25% cases between 12 AM to 6 PM. Most of the bites were on the lower limb (77.63%); upper limbs were bitten in 21.95% of victims. Only one patient was bitten by krait on the trunk while sleeping over the floor [22].

Another similar study was conducted in the Kintampo and the Bole District hospital in the Northern Region of Ghana. a prospective documentation of snakebite cases presenting to the two hospitals in the period between January and December 2012. The study designed by collected detailed quantitative information on the socio demographic background of the victims, the exposure and circumstances associated with the bite, the pre-hospital care received by the victim, as well as the clinical presentation and treatment outcomes during hospital stay. one hundred sixty-three of snake bite cases were reported during one year study period. This gives a facility-based study done incidence of 110/100,000 population in Bole and 74/100,000 population in Kintampo, and an over incidence of 92/100,000 population. The majority were men (62%) and the mean age of 24 year [15,21].

There was a 92 female farmer who was bitten on the lower extremities while working on the farm. Only about 47% of the victims had any form of education with less than 1% going beyond secondary education. Most victims were farmers (41.7%) or students (33.1 %). The highest number of snakebite cases were recorded during the months of April (14.3%), June (12.4%) and November (12.4%). Two thirds (68%) of the bites occurred at night. Bites occurred most when victims were undertaking farming-related activities (50.3 %), other outdoor events (playing on the field and hunting (16.0%), and in-house activities (waking up to urinate, sleeping) (13.5%). About 86% of bites occurred at the extremities with lower limb involvement. In cases where the snake was seen (58.3%), the majority (75.9%) could not describe the color. The most common colors of snake that were reported were black in 17 cases, black and white in 2 cases, and green in 1 case. Victims or other individuals present at the scene identified the 17 'black' snakes as cobras. In 12 cases, victims/bystanders reported that vipers were involved, which they identified by their local names (i.e. Akwatia and Kyereben). All victims reported to the hospital more than one hour after the snakebite. Average time of presentation after the snakebite was 3.6 (1.0SD) hours and this did not differ with sex and age of victims. The majority (49%) of the patients presented to the emergency room between 4-12 hours after snakebite occurred. In general, few patients received any form of pre-hospital treatment. Pre-hospital treatments that were reported included external application of local herbs (35 cases), incision at the site of bite (16 cases), wound cleaning with water (10 cases), and application of tourniquet (6 cases) , 'black stone' to the site of bite (5 cases) & Other traditional remedies [4,11].

A sample size of 16500 is sufficient to demonstrate an annual incidence of 50 per 100,000 with a 95% confidence interval of  $\pm 20$  per 100,000. Considering the non-compliance and non-response, an extra 10% of the participants were encompassed. There for 3993 households were approached. Bangladesh in one year prospective multistage cluster sampling methods of households within six administrative division study among 98 snake bites 52% are males and 48% females. among age >50 years (23%), 11-20 years (22%), similar to 0-10 years (22%), 41-50 years accounts 11% of snake bite victims. Majority of the victims 71% bitten at the lower extremities, followed by the upper limb (27%) and other parts of the body accounts 2% . The distributions of the monthly snake bites mainly at October (22%), July (15%) accounts for the highest proportions of snake bite episodes harvesting activities increases during this month. A relatively high proportions of snake bite happened during night time (36%) because at night. Most of the snake bites occurs in water (27%), followed by the field at work out doors (24%) indoors (23%). 86% of the victims received management at hospital within two hours, although only 3% of them received herbal medications lately arrival to hospital after one days, only one death were reported [11]. In Nepal and Bangladesh showed that 90% and 98% of snake bite victims, respectively used tourniquets. In Bangladesh, incisions at and around the bite site were made in 28% of envenomed victims and 13-14% of those without sign of envenomation's. In North West India, incision and drainage were practiced by 20% of the patient [16, 17].

The most frequently encountered clinical presentation was pain at bite site (93%), swelling (84%), and local bleeding (51%). Other manifestations of envenomation included generalized edema (27%), hypotension, hematemesis (12%), dizziness (12%), as well as headache, fever, chills, diarrhea, hematemesis, and anuria. 107 (66.0%) patients showed a prolonged clotting time as measured by the whole blood clotting test. Management and outcome of snakebite patients is presented with a total of 125 cases (77%) received snake anti-venom. The majority of patients (61%) were given between 2-5 vials of the snake anti-venom; only one patient received 12 vials before full recovery was achieved. Most patients also received antibiotics for infection prophylaxis (96%), corticosteroids (91%), and anti-tetanus prophylaxis (74%). Blood transfusions were given to 10% of the patients [17].

Nearly all patients (98%) were admitted to the hospitals. Of these, 78.4% were successfully treated and discharged, 4% requested for discharge against advice from the medical team, while

17.3% were referred to a higher level health facilities for reasons such as shortage of blood at the hospital, shortage of anti-venom, and severe infection requiring advanced care. On average a snakebite patient stayed in the hospital for 4.4(1.9SD) days. The length of stay did not vary with age or sex of the victim [16].

Another similar Study was done on the Clinico-Epidemiological Profile and the Outcome of Snake Bite Victims in a Tertiary Care Centre in Southern India , A total of 180 cases of venomous snakebite cases were included in this study, who had reported to the hospital from January 2010 to December 2011. In this study sample, a majority of snake bite victims were aged between 20-40 years. The mean age of the male victims was 36.6 years (range 15-68 years) and that of the female victims was 44.2 years (range 17-62 years) [26].

The detailed demographic profiles of the snake bite victims have been presented in Most of the cases were males (60.55%) and the male to female ratio was 1.5:1. A majority of the patients were farmers (54.4%) and plantation workers (30.5%). And 41 patients (27.22%) were illiterates. The biting species was identified only in 98 cases and the commonest species was Russell's viper (58 cases), followed by cobra (25 cases) and common Krait (15 cases). Demographic factors of snake bite victims. The peak incidence in the snake bite cases occurred during the months of July to September. Most of the victims were bitten outdoors (n=149, 82.7%), mostly in the field during the day time (70.5%). The most frequently bitten site was the lower extremity (67.22%). A majority of the snake bite victims were from the rural areas, with a rural to urban ratio of 4.2:1 [9].

Definitive fang marks were seen in 94.5% of the cases, double punctured fang marks were observed in a majority of the cases (67.7%) and in 10 cases, scratch marks were present at the site of the bite. Only 17.2% of the snake bite victims could come to the hospital within one hour of the bite. First aid measures were employed in a majority of the patients (n=150, 83.4%), while the other 30 victims did not received any first aid treatment [13, 24].

The mean duration of the hospital stay was 6 days (range 1-23 days). The incidence of the complications like acute renal failure, gangrene at the bite area, DIC and ARDS were more in the subgroup of patients who presented to the hospital after a delay of > 6 hours. No fatal outcome was reported in the victims who were admitted within 24 hours of the snake bite, thus suggesting



the importance of an early specific treatment. Seven patients died, due to acute respiratory distress syndrome (ARDS-3 cases), disseminated intravascular coagulation (DIC-2 cases), and intracerebral hemorrhage (2 cases), thus giving a mortality rate of 3.8% [26].

Similar study was carried out Pakistan, at Liqueate University Hospital Hyderabad/Jamshoro during the year 2008. One hundred cases with history of snake bite, from different districts of Sindh were analyzed. Patients included were those with the presence of fang marks and presence of swelling, cellulites, bleeding or blister formation at local site. A total of one hundred cases of snake bite were included in the study from the period January 2008 to December 2008. Seventy-three (73%) cases had been bitten by poisonous snakes while 23 (23%) by non poisonous ones. Most of the cases of snake bite occurred during the months of July and August [4, 9]. Majority of victims of snakebite were from Tando Mohammad Khan and Hyderabad (rural) districts of Sindh. Out of 100 cases, 70 (70%) were men, 25 (25%) were women and 5 (5%) were children. Most of the cases were young rural men with a mean age of 24 years (range 8–55 years). The urban to rural ratio was 1:4.5 and the male to female ratio was 4:1. The place of bite was close to the home (25%) and the rest in or around the fields. Some 40 (40%) of snakebites occurred at night when the victims were asleep and 60 (60%) during the afternoon nap sleeping. The most frequently bitten site was the legs below knee (80%). Arrival at hospital was within 1 hour of the bite, and they were given anti-venom immediately if the clotting time was prolonged or if ptosis was evident. Another, 50 victims (50%) arrived and were treated within 1–3 hours; 25 (25%) within 3–6 hours and 10 (10%) arrived at hospital more than 6 hours after the bite. The median time to arrival at our hospital after the bite was 3 hours. Medical referral records were available with 45 (45%) patients. Forty patients (40%) had received treatment before coming to other hospital among the types of treatment already received were tourniquet tied in eight patients, incision and drainage was performed in 5 and anti-venom was given to 23 victims. Four patients (4%) were referred after antiseptic dressing of the bitten site [13, 24, 26].

Similar descriptive cross sectional study was performed in the Teaching Hospital Anuradhapura in the North Central Province of Sri Lanka from May 2010 to 2011 May to describe the characteristics associated with cases of snake bite. Inclusion criteria were children whose age less than twelve years. There were 27 males and 23 females. Out of these, six were mistaken to have been bitten by snakes but were in fact bitten by centipedes (50%), black ants (33%) and

scorpions (17%). The highest number of snake bite victims 21 (48%) were in the age group 6-12 years and lowest 9 (21%) were in the <1 year age group. Envenomed bites were caused by venomous and mildly venomous snakes and a few of the unidentified snakes. Only the venomous species caused the bites that resulted in severe envenomation. Hump-nosed pit viper (*Hypnalehypnale*) accounted for the highest number of venomous bites 8 (44%) .Antivenom serum (AVS) had to be administered in 39% of venomous bites. Deaths accounted for 2 (5%) of the cases. Both were due to Common krait (*Bungarus careuleus*) bites. In this study the three krait bites were caused by *Bungarus careuleus* species. Swelling (59%) and bleeding (48%) were the most common symptoms for these patients. Lower limbs were the most common site of bite (73%) and in (7%) of patients the site of bite was in the region of face and scalp. The majority of cases (64%) took 1-4 hours to reach the teaching hospital. Reassurance (80%) and immobilization (75%) were the most common first aid types given to these patients. In the study snake bite victims were children, and they were carried by their parents until they got into the vehicle and were transported to the hospital ward. No pressure bandages or any other total body immobilizations were done. A tourniquet was used in (9%) of cases. The majority of the bites 26 (59%) occurred between 6 pm to 6 am. A significant number of venomous bites occurred indoors 4 (22%) while sleeping [15,21].

A prospective Snake poisoning study was done in Rural Zimbabwe; over a period of two years (January 1991 to December 1992) 274 cases of snake bite were admitted to hospital in the eight provinces of Zimbabwe. Of these patients, 54% were males and 88% belongs to the 6-40 year age group. Five deaths (1.8% of the total cases) were reported. The majority of snake bites (63%) occurred at night (between 6.30 AM and mid night) and over 74% took place during the hot rainy season that is between November and April. In over 58% of the cases the victim accidentally stepped on the snake, the snake being cobra in 37% of the patient, puff adder in 20% and the black and green mamba in 18% of the cases. Most of the bites occurred on the leg, below the knee. Treatment of snake envenomation consisted mainly of the administrations of antibiotics (151cases), analgesics (144 cases), Anti venom tropical snake polyvalent (ATT)(89 cases), tetanus toxoid tetanus(TT)(61 )cases),antihistamines(47 cases) and traditional medicines(43 cases). This study indicates that snake envenomation's in rural Zimbabwe is common but fatalities are relatively rare [19,20].

Similarly A retrospective study done in Zimbabwe Hospital record at the six major referral hospitals in Rural Zimbabwe were reviewed for the years 1980-1989 in order to determine the type of snake, incidence, morbidity and mortality associated with snake venom poisoning. From the total of 1087 cases of animal toxin poisoning were retrieved retrospectively, 91.5%(995) of which were due snake venom poisoning. Of 995 cases, 50.9 % (506) were females and 49.1%(489) males. The majority of patients were aged from 21-30 years (22%), followed by the 6-15(16%) and then 16-20 years of age groups(11%), respectively. The mean period of hospitalization of a snake venom poisoned patient was found to be two days (the range was 1 -9 weeks).The first line treatment most used was a combination of antibiotics (44.6%),alone or with an antivenom tropical snake polyvalent (ATT) (21.2%), and analgesics(19.9%). Mortality was recorded at 1.8%(18 patients)and the few records of the type of snakes associated with envenomation in order of frequency were the cobra, mamba and boomslang.The prevention and promote treatment of snake envenomation is priority in the reduction of incidence of poisoning [19,20].

Another prospective study conducted and to review the epidemiology, treatment and out come of snake venom poisoning in central Karnataka. Six Hundred and thirty three cases of snake bite, seen in a teaching hospital, up to the age of 18 years, over a period of 18 years from 1985 to 1992 constituted the materials of the study. Detailed history with the special reference to the type of snake circumstance leading to the bite and clinical consequences were studied and final outcome was noted males (n=433) were bitten more often than females (n=200). Two hundred and fifty six (40.4%) cases were in the age of 11-15 years. The cases were seen during two periods, i.e. October, November, December (n=210) and April, May, June (n=199). Most (n=506) were encountered in the lower limb. Viper was the most common poisonous snake. Five hundred and seventy (70%) cases were from the rural area. Coagulation time was prolonged in 371(58.6%) cases, hemorrhagic syndrome was noticed in 354(55.9%) cases, and Neurological involvement in 79 (12.5%) cases Poly valent anti snake venom (ASV) was given to 479 cases. Hyper sensitivity to ASV was noted in 8 cases. Blood transfusion was given to 33 cases for the management of excessive bleeding. The death rate among snake victims was 5.2(33) cases [25].

Another study was done in the United States, poisonous snake accounts for approximately 8.000 bites annually, resulting in about 9 to 10 fatalities. The majority of deaths occur in children, the

elderly, and untreated or mistreated individuals. Pit vipers accounts for almost all bites. Diagnosis and treatment are based on sign and symptoms of envenomation along with identifications of the snake. First aid treatments should focus on transporting the victims to the nearest medical facilities as soon as possible. The mainstay of treatment for envenomation is the prompt administration of sufficient quantities of the appropriate anti venom [27,28,29].

Another study conducted Snake bite envenomation in Riyadh province of Saudi Arabia over the period of (2005-2010) study done a retrospective review of snake bite in Riyadh province over the period (2005-2010). A six years ,A total of 1019 cases of snake bite admitted to the ministry of health medical center in Riyadh province were analyzed on the bases of age, sex, time of bite and its site on the body, outcome of treatment, antiserum dose and type of snake. Bite occurred through out the six years with the highest frequency in 2005 and the least in 2006 where most of the bite cases were mild and all evolved or cured except four patients who died following the administrations of ant venom during 24 hours after snake bite. Most of the patients were males (81.7%) and the most attacked age range of 11-30 years (51.5%). All the bites were mainly in the exposed limbs and the most frequently bitten anatomical regions were the lower limb (427 cases, 41.9%), principally the feet. The study incriminates *Crotalus cerastes* in most of the bites indicating it as the snake of medical importance in Riyadh province. Also, the study indicates low degree of threat in spite of high rate of snake bites as a result of the availability of the medical facilities and ant venom use in medical centers in Riyadh province. The highest rate ( $P < 0.05$ ) of snake bite was in 2005 with 183 cases (17.90%) while 160 cases (15.70%) were recorded in 2006. Ninety-eight bite cases (9.6%) were recorded with age category below 10 years. 13 bites were their twenties (28.5 cases, 2% over 61 (1.2%) while most patients were males in 7.7%) [31,32]. September accounts a high rate of snake bites. While others showed that a relatively low rate of snake bites. The highest rate of bite cases occurred at night during all the years. The nocturnal bites counted 505.9 cases (49.60%) and the diurnal ones were 284 cases (27.8%) while undecided time cases counted 229 (22.49%). The analysis of the data showed that the highest nocturnal bites ( $p < 0.05$ ) were recorded. The number of death 4 out of the total of 1019, which makes 0.3%. Other bitten patients evolved to cure after being hospitalized. No cases were discharged against medical advice

## CHAPTER THREE

### OBJECTIVES

#### **3.1. General objective.**

To assess the prevalence and outcomes of snake bite among patients attending at Abdurafie Towna governmental health center and MSF Holland (NGO'S) From January 2011 –December 2014 (September 2003-August 2006) N/West, Gondar, Ethiopia.

**2. Specific objectives.** To achieve the general objectives of the study, the following specific objectives were addressed.

1. To assess the prevalence of snake bite patients at Abdu Rafi Town a governmental health center and MSF Holland (NGO'S) from January 2011-December 2014.
2. To determine the pertinent clinical features of snake bite victim attending at Abdurafie Towna governmental health center and MSF(NGO'S) during the study period.
3. To assess the management of snake bite patients attending at Abdurafie town a governmental health center and MSF Holland (NGO's) during the study period.
4. To assess the outcomes of snake bite patients attending at Abdurafietown a governmental health center and MSF(NGO'S) during the study period.

## **CHAPTER FOUR**

### **METHODES AND MATERIALS**

#### **4.1. Study Area and Period.**

The study area Abdurrafie town located in Amhara region, North Gondar and it is "230" km apart to North West and "950" km apart from the capital city of Ethiopia, Addis Ababa. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), Abdurrafie has a total population of 72,000 out of these 37,564 has been females and 34,436 men; most populations are rural inhabitants. MSF Holland and health facilities and governmental health center provides treatment and is open 24 hours for emergency services. The study was conducted from January 2011—December 2014.

#### **4.2. Design of the study.**

The study was conducted institutional facility based retrospective, descriptive, cross-sectional study.

#### **4.3. Population of the study.**

All populations were lived in the community of Abdurrafie town and its rural communities.

##### **4.3.1. Source Population.**

All patients attending at Abdurrafie Town governmental health center and MSF (NGO'S) during the study period from January 2011-December 2014 GC. N/West; Gondar, Ethiopia.

##### **4.3.2. Study population.**

All victims of Snake bite patients attending at Abdurrafie town governmental Health center and at MSF Holland during the study period from January 2011 to December 2014 GC.

#### **4.4. Inclusion and Exclusion criteria.**

##### **4.4.1. Inclusion Criteria.**

Subjects of the study includes all age groups and sex snake bite victims attending at Abdurrafie town health center from January 2011—December 2014 GC. North West, Gondar; Ethiopia.

#### **4.4.2. Exclusion Criteria.**

- insect bite (scorpion and other Arachnida)
- Other Animal bite
  - -Incomplete snake bite victim medical record data.

#### **4.5. Sample size and sampling procedures.**

##### **4.5.1. Sample size determinations.**

All those snake bite victims who came at Abdurafie town a governmental health center from January 2011- December 2014 GC.

##### **4.5.2 Sampling Technique and procedures.**

All snake bite victims who attended the health center and medicines sanfrontier's in the study period.

#### **4.6. Study variables.**

##### **4.6.1 Dependent Variables:**

- Outcomes of snake bite
  
- Clinical manifestation of the victims

##### **4.6.2.Independent Variables:**

- Age
  
- Sex
  
- Marital status
  
- Occupation.
  
- Anatomical site of snake bite.
  
- Arrival time of health center.
  
- Species of snake.
  
- Place of inhabitants

## **4.7. Methods of data collections, procedures and controls.**

### **4.7.1. Data collection instrument.**

Before the data collected by the data collectors explanation was given about the aim of the data was collected by using observational check list patient reviewing medical chart. The check lists were composed of on socio demographic variables, anatomical site, attacked time, durations or arrival time to health center, clinical features & managements, the length of hospital stay, the prevalence and the outcome of snake bite during the study period.

### **4.7.2. Data collector personnel.**

The data was collected by a total of one investigators one supervisor and three staff trained and oriented for one day health professional data collectors . Before the data collectors fill the check -list written clear information's was given about the aims of the research.

### **4.7.3. Data quality control.**

To assured the quality of data , structural data collection check list was used. during the data collections procedures , all the collected data was observed and checked the previous medical individual record fills, by checking consistency & completeness, cross-checking 10% of the check list every day by supervisor and principal investigators, supervision and pre-testing by 5% health workers at the study area. Finally necessary comments and feedback was incorporated for the final instruments.

## **4.8. Operational definition.**

Prevalence:- the amount of diseases indicates that the number already existing cases in a populations.

Anti-venom:- The only specific antidote to the toxins in snake venom.

Poisonous snake:-snakes that envenoming or toxic to human beings.

Non-poisons snake:-snakes that do not cause envenoming.

Squealed-Snake bite patients who develops acute or chronic complications physical, social or psychological insult like renal dysfunction, tissue lose, limb amputation.

## **3.9. Data entry, analysis and interpretation:**

The data obtained was edited manually, coded and entered in to the computer and analyzed using the statistical package for the social science (SPSS) version 20. 0 .The result was displayed by



using frequency tables, graphs and charts. Chi-square test and binary logistic regression analysis was used to test association between categorical variables.

### **3.10. Ethical considerations.**

Ethical clearance and approval letter to conduct study was obtained from department of Emergency medicine of Addis Ababa University(AAU), IRB and from hospital administrations, after the submissions of proposed project. Then to communicate with Abdurafie town health facility medical administrative bodies, then the permission letter was obtained from the administrative body. Finally verbal consent was obtained from the data collectors immediately before starting the duties. During card review patient confidentiality was kept.

### **4.11. PLAN FOR DISSEMINATION RESULT:**

The study result will be presented to Addis Ababa University, College of Medicine and Health science, department of emergency medicine. And the documents were disseminated to Amhara regional health Bureau, Abdurafie Town a governmental Health Bureau, and to other concerned bodies.

## CHAPTER FIVE

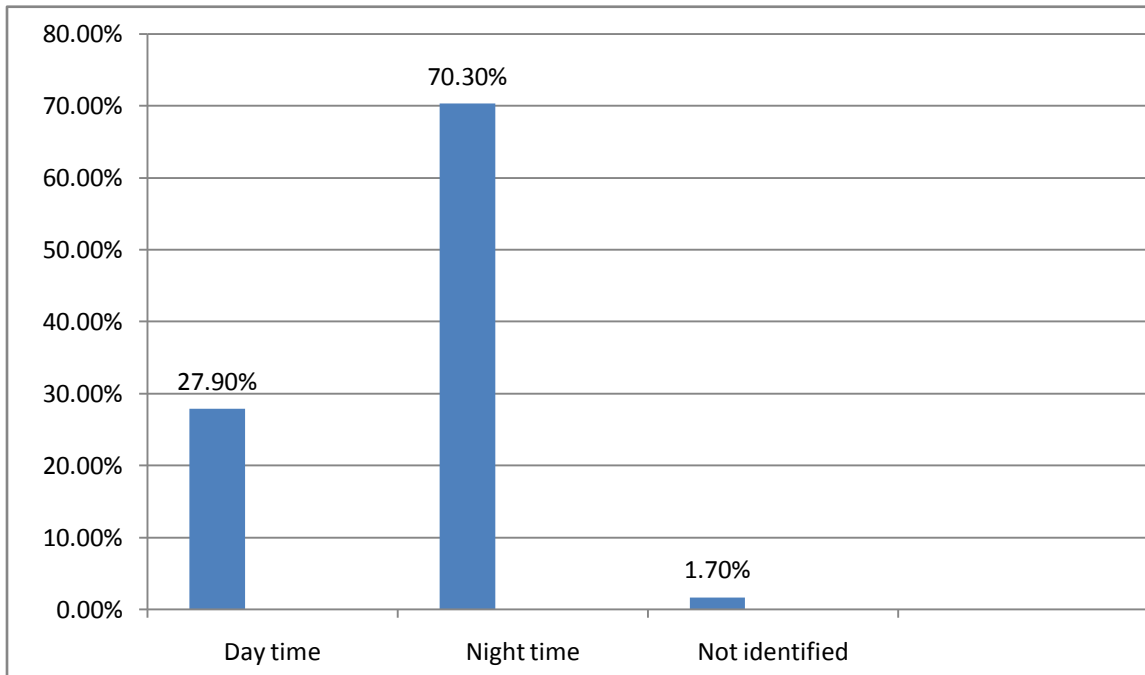
### 5. RESULT

There were 408 snake bite victims who presented to Abdurafie town a governmental health center and MSF Holland (NGO'S) from January 2011 to December 2014 GC were studied. A total of 408 subjects with cases of snake bite victims were studied during the study period. Predominantly males 358 (87.7%), were females 50 (12.5 %) and male to female ratio was 8:1. Majority of the study participants were the age group of 21-30 (48.8%). The mean age  $25 \pm 1.045$  with the range of ( 5-55 yrs.). 13(3.2%) of the age greater than 50 years. Children (less than 10 years) were 23 (5.6%). Majority 305 (74.6 %) were farmers followed by 35 (8.6%) of animal husbandries, 33 (8.1%) housewives and others 35(8.2%) 5.6%. Majority 283 (69.4 %) of attacked from outdoors whereas 18.1% of snake bite where indoors while others 12.5% of victims whereas not identified.

**Table:- 1** .The table shows summery of Socio demographic data, the distributions of frequency and percentage of study participants from January 2011-Dcember 2014 GC at Abdurafie town a governmental health center and MSF Holland (NGO’s).N/West, Gondar, Ethiopia.

Variable	Group	Frequency(n=408)	Percent (%)
Age	Up to 10 yrs	23	5.6
	11-20 yrs	83	20.3
	21-30 yrs	199	48.8
	31-40 yrs	70	17.2
	41-50yrs	20	4.9
	>50yrs	13	3.2
Sex	Male	358	87.7
	Female	50	12.3
Address	Rural	386	94.6
	Urban	22	5.4
Religion	Orthodox	365	89.5
	Islam	29	7.1
	Protestant	9	2.2
	Others	5	1.2
Ethnicity	Amara	330	88.9
	Tigre	64	15.7
	Oromo	6	1.5
	Others	8	2.0
Educational status	Cannot read and write	372	91.2
	Can read and write	7	1.7
	Primary school	26	6.4
	Secondary school	3	0.7
	Higher education	0	0.0
Occupation	Farmer	305	74.6
	Animal husbanderies	35	8.6
	House wife	33	8.1
	Fisheries	8	2.2
	Gardians	4	1.0
	Others	23	5.6

Periodic attacked time distributions of Snake bite victim.



**Figure:-1.** Shows that the time distributions snake bite patients at Abdurafie town a governmental health center and MSF Holland (NGO's) over the period of 2011-2014 GC. North west, Ethiopia, North Gondar.

Majority 287% (70.3%) of snake bite victims were attacked during the period of night time.were as 114 (27.9 %) were bitten at the day time while 1.7%were not identified.

**TABLE :-2.** Shows the frequency and percentage distribution of snake bite patients where the place of attacks, Arrival time and pre hospital first aid interventions had been received at Abdurafie a Governmental health center from 2011-2014 GC. N/West, Ethiopia.

Variables		Frequency (n=408)	Percentage
Place of attack	Indoors	73	18.1
	Out doors	283	69.4
	Not identified	51	12.5
Arrival time to the health center	With in 1 hour	82	20.1
	1-2 hours	101	24.8
	2-3 hours	50	12.3
	3-4 hours	27	6.6
	4-6 hours	14	3.4
	>6 hours	123	30.1
	Not identified	11	2.7
Anatomical sit of snake bite	head & neck region	12	2.9
	Upper extremities	129	31.6
	Chest	4	1.0
	Abdomen	11	2.7
	Spinal	6	1.5
	Pelvic	8	2.0
	Lower extremities	236	57.8
First aid interventions had been received.	herbal medication	20	4.0
	Wound Incision	37	9.8
	Tourniquet apply	107	26.2
	Wound dressing	47	11.5
	Mixed	32	7.8
	Noon	165	40.0

From 408 /243 (59.6% of snake bites patient who had received first aid interventions(26.2%) were applied tourniquet; 47(11.5%) wound dressing; 37 (9.8% ) incision at the site of bite; 20( 4.0%) herbal medications and 7.8% combined interventions had received. treatment. The rest 160

(40.4%) didn't have received first aid.

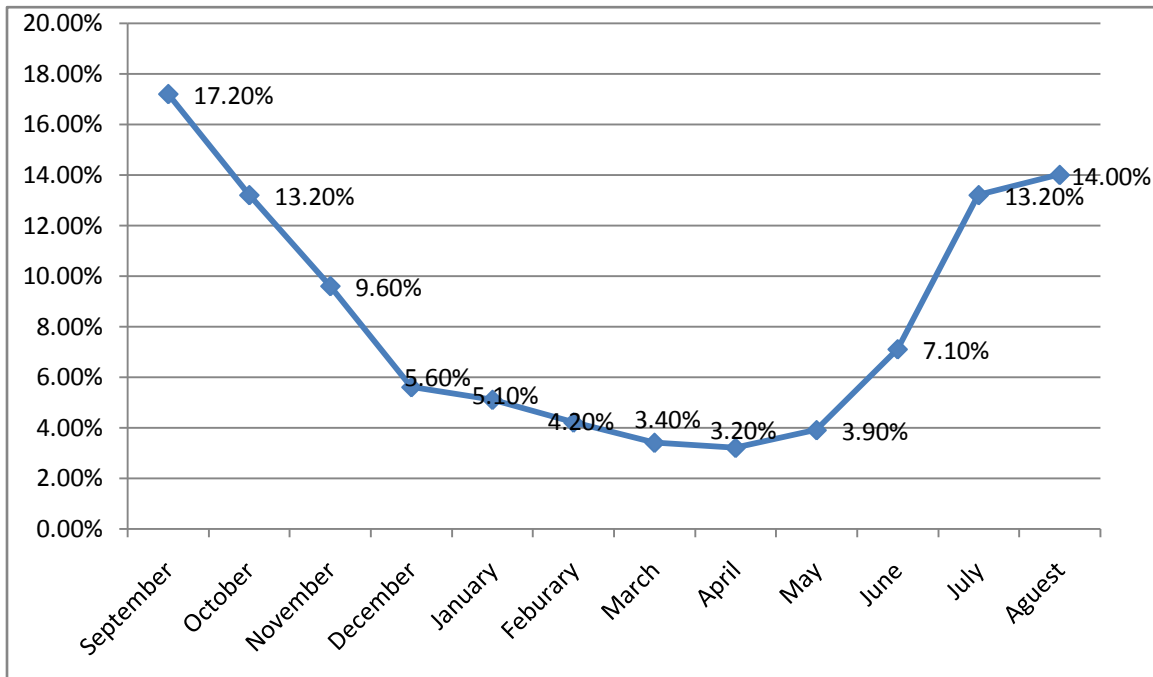
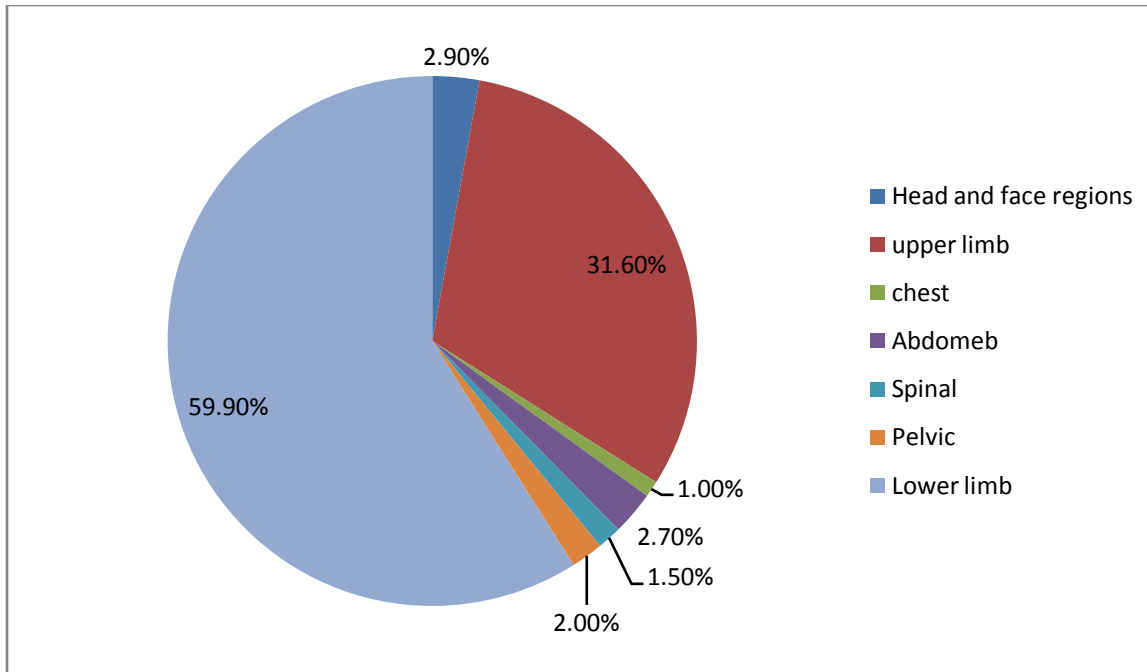


Figure-2: -shows that Percentage and incidence of snake bite victims monthly seasonal variations throughout the year. At Abdurafie a Governmental Health center and MSF Holland (NGO's) from January 2011-December 2014 GC.

The majority of victims were affected by snake bite predominantly the month at September (17.2%) while others common from June to November. Regarding the arrival time of the victims at the health center were majority (30.1 %) within 6-12 hours; 82 (20.1%) while reaches with in one hrs. The arrival time of the mean  $3.5 \pm 2.0$ . The mean length of hospital stayed 3.27 days  $\pm 1.87$  % the average were 6 days.



**Figure3:-** Shows the frequency and percentage of snake bite victims associated with Anatomical site of the body at Abdurafie governmental Health center and MSF Holland( NGO'S).From January 2011-December 2014.

Majority 57.8%, of snake bite victims was bitten the lower limb, the head and face region ,the upper limb,chest, abdomen, spinal and pelvic (31.6%, 2.9%, 1.0%, 2.7%,1.5%) of bitten respectively recorded.

### Yearly Incidence of Snake bite From During the study period.

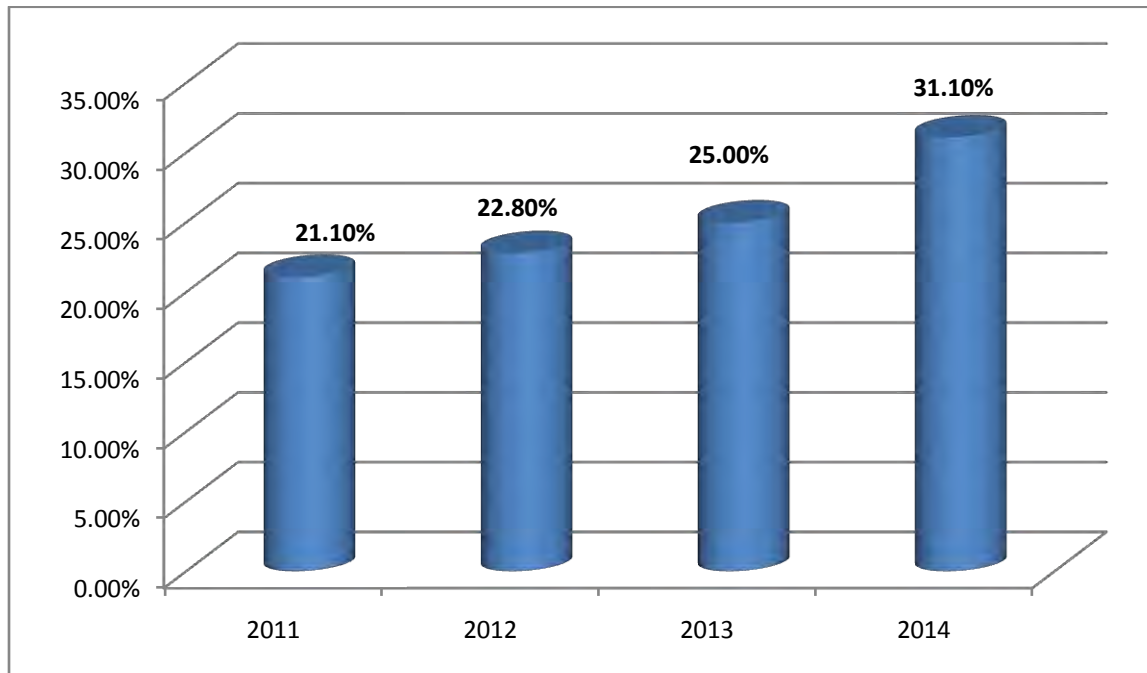


Figure 4:-The figure shows that annual distributions and incidence of snake bite victims at Abdurafie a governmental health center and MSF Holland (NGO'S) from January 2011-December 2014 GC.

The prevalence of snake bite from the study participants were increases from year to year while 408/86(21.15%) patient were seen in the beginning of the study period in 2011. In 2012 were 93/408 (22.8%) of victims observed; while 102/408 (25.0%) patients recorded in 2013. The highest snake bite patient flow 127 /408 (31.1%) snake bite patients were recorded in the year of 2014 GC.

The total prevalence of proportions from the source of population results shows that varies for each year in 2011 N=18,000 (0.6%), in 2014 N=22,000 (1.85%); in 2013 N=23,500 (1.78%); where as in 2014 N=27,000(1.5%).



**TABLE 3:-** The table Shows that distributions of clinical features frequency and percentage of snake bite patients at Abdurafie governmental Health center and MSF Holland (NGO'S) from January 2011-December 2014 GC.

Local symptoms		Frequency	Percentage
	Local pain	368	90.2
	Systemic pain	40	9.8
	Local swelling	345	83.3
	Generalized swelling	63	15.4
	Signs of fang marks	68	16.7
	Lymphadenitis	58	14.2
	Local tissue laceration	95	23.3
	Ecchymosis,brusing	33	8.4
Neurotoxic symptoms	Petosis	8	2.0
	Dysphagia	48	11.8
	Dyspnea	146	35.5
	Limb weakness	70	17.2
	Bulbar palsy	36	8.8
Bleeding disorder	Epistaxis	54	13.2
	Gingival bleeding	66	16.2
	Bleeding from site of bit	123	30.1
Physiological vital sign	Hypotension	109	26.7
	Tachycardia	153	37.5
	Bradycardia	50	12.5
	Peripheral/central cyanosis	39	9.6

Majority (90.2%) of snake bite victims developed local pain; 9.8% systemic pain, 21.1% fang mark while (86.7%) and (15.4%) local swelling and generalized swelling respectively. Hematological manifestations that is 30.1% bleeding from the site whereas 16.2%; gingival and nasal bleeding contributes (13.2%). While to these Cardiovascular manifestations who had developed Hypotension, tachycardia, bradycardia, peripheral and central cyanosis 26.1%, 37.5%, 12.5%, and 9.6% respectively.

**Table 4:-**Managements of snake bite patient at Abdurafia governmental health center and MSF (NGO'S) from January 2011-December 2014 GC. N/ West; Ethiopia, Gondar, Addis Ababa.

Medical managements of SB patient at health center & MSF Holland.	Patients who had received	Frequency(n=408)	Percentage
	Anti-snake venom	285	69.9
	Antibiotic	282	69.1
	TAT	137	33.7
	Whole blood transfused	67	16.4
	Crystalloid iv fluid	150	37.7
	Wound debridement & daily wound care	27	6.6
	Analgesia.	368	90.2

From the total of snake bite victims 69.9% were received Anti snake venom (ASV) were as with or without combined with Antibiotic 69.9%, TAT prophylaxis 3.7%, whole blood transfused 16.4%, proper wound management 6.6%, crystalloid fluid 37.7% and 90.2% were received analgesia.

**Table 5:-**The table shows that the frequency and percentage of snake bite were whole blood clotting test positive From January 2011-December 2014. At Abdurafia a governmental Health center. N/West; Ethiopia.

Snake bite victims	Frequency(n=408)	Percentage
Clotting test positive	351	86.0
Clotting test negative	57	14.0

Majority 86.0% positive whole blood clotting test result were envenoming snake bite. Whereas 14.0% show that non-envenoming snake bite. Among those snake bite victims 69.9% were received Anti snake venom.

**TABLE 6:-**The table shows that the distribution and percentages of outcomes of snake bite at Abdurafie governmental Health center and MSF Holland (NGO'S) from January 2011-December 2014 GC.N/West; Ethiopia.

Outcomes of snake bite	Frequency(n=408)	Percentage
Improved and discharged	302	74.0
Referred to higher hospital	72	17.6
Local tissue loss	5	1.2
Corrective amputation was done	3	0.7
Death	15	4.9

Majority (74.0%) were improved, 17.6% were referred to higher hospitals while 3 cases (0.7%) were corrective amputation. The mortality rates of snake bite patients 15 (4.9%)

## CHAPTER SIX

### 6. DISCUSSION

In this study 408 snake bites patients were recorded. Of these, 87.7% were males who engaged in agriculture with a male to female ratio of 8:1. In males outnumbered females in the present investigation. It might be in fact that men spent their time were elaborated in farming activities their life outdoors. The current finding was higher compared to study done in Zimbabwe referral hospital (n=1087) where by ; males accounted 49.1% [19,20]. Study done in Pakistan, Liate university hospital, (n=100) majority of victims were males 73.0% who were victims attacked by poisonous snake bite where 40% of the victims attacked indoors during night times (sleeping) [7,8]. The current finding result (n=351) 86.0% of poisonous snake venom were confirmed by clotting tests positive result. While in addition to these the study showed that majority of them were attacked outdoors (69.4%) and this is nearly consistent with Nigeria Gombe Mustapha hospital study with male to female ratio 6:1; where 75% of victims attacked outdoors [15,21,30] and night times attack is reported by various observational studies.

Of the victims in the current study children aged 3-10 years accounted 23 (5.6%), vulnerable peak attack was observed in those age groups of 21-30 years (48.8%) followed by 11-20 years (20.3%). This may be explained by where this age category is associated with the most outdoor activities. The current finding is consistent with the findings made in Nigerian, national Hospital study where the peak age group were 21-30 years (36.9%). Besides, 385 (94.4%) of patients were from rural areas and this is comparable with a study conducted in Pakistan, Eight years prospective study reported carried out in South India; central Karnataka, 256/633 (40.4%) were belonging to the age group between 11-15 years; and 570/633 (70.0%) of the cases were in the rural areas [25]. Retrospective study conducted in Saudi Arabia, Riyadh over six years period (2005-2006) n=1019; were 98/1019 (9.6%) recorded age below 10 years whereas 13 (1.2%) over age of 60 years [31,32,33]. However Research in Sirilaka, North central province international hospital studied for 1 year, indicated that those aged 6-12 years accounted 21/57 (48%) of snake bite. In South India, 256/633 (40.4%) of snake bite patient aged 11-15 years; Similarly in Zimbabwe a 2-years prospective study showed 88% (n=274) of the victims were 6-40 years [19,20]. The difference by across age groups could be explained by the possible existence of most of venomous snakes near to the public inhabitants where children's playing or sleeping

on the field with inadvertently attacks, or possibility of child abuse who might be under protections and controls. Furthermore, snake might move the dwelling areas to search food and then resulting in biting.

The current study revealed those aged >50 were less affected accounted about 3.2%. However, in Bangladesh a one year multi stage cluster sampling study conducted in North East Asia reported that (n=100), were age >50 years of snake bite victims were accounts 23 %. This could be justified by the possibility of limited agricultural and related activities as age increases in our country.

In this study we found that snake bite extent was more during June-November, where maximum number of attack reported on September n=70 (70.3%), followed by July and August contributed (n=56). The flow of snake bite incidence low were reported in the winter month. This may be due to the fact that snakes hibernate and becomes totally in active due to lower ambient temperatures. A study in South India reported the peaks on November, December (n=210) and April, May, June (n=199). Seasonal variation in the incidence of snake bite was in according to with increased agricultural activities. Furthermore it might be snakes as they come out of their shelter, also other possibilities due to geographic variations in rainy seasons. In Zimbabwe, majority 63% of snake bites were recorded at night times[20], while in Pakistan 40% were poisoned sleeping time and 60% during the afternoon nap sleeping [9,10] and in Nigeria, 92% of victims bitten at the day time[21,30]. From the current study the most frequent victims attacked at night time (70.3% and night to day ratio of 2:1. In Saudi Arabia, Riyadh study reported the highest rate of bite recorded attacks at night accounts 505.9/1019(49.60%) were 284(27.8%) diurnal while undecided [33]. The mean time to reach health centers after snake bite were 3.5 hrs $\pm$  2.0 with a range of 1 days. Similar study were conducted In Gana-kintampo study reported that the average arrival time 3.6 hours $\pm$ 1.0 SD with a range of 4-12 hours[11,12,13]; were as in Sirilanka the range of arrival time was 1-4 hours [15,21 ]. The current finding result shows that majority of cases late time arrival after bite. The possible reasons it could be correlated to inaccessibility of transportations systems. Furthermore it might be lack of awareness most individuals that snake bite needs a real medical emergency intervention. Delay contributes for the undesired outcomes, whereby early arrival could reduce the length of hospital stay as well as fatality rate.

Out of 319 admitted, the median length (LOS) of stay in the current study was 3.27 days  $\pm$  2.0 with a range of 3-8 days. A study done in North regions of Ghana-kintampo showed a mean length of stay  $4.41 \pm 1.9$  (n= 174) days where as it was 6 days ranging from 1-23 days [4,9,10]in South India. The difference in LOS between the these studies could be attributed to differences in age, the bite of anatomical sites as well as multiple sites of attacks and possible systemic complications of the patients.

In this study, lower extremities were found to be most frequently (59.6%) affected site. Upper limb, head and face regions, the chest and the abdomen, contributed about 31.6%, 2.9%, 2.0% and 2.7%, respectively. Majority of the study showed that the lower extremities are the sites that most frequently attacked by snake bites.on the basis that the exposed limbs are usually used in most manual activities and moving or entering the snakes departures. The current finding is consistent with the study conducted in North central Province of Sirilanka where 73% of the bites belonged to lower limb. But, there was a difference in head and face region where it accounted about 7.0%. The difference could be related to involvement of children spent more lift time outdoors agricultural activities at their earlier age in Sirilanka compared to the current finding.

In this study pre-hospital first aid 243/ 408 (59.6%) interventions were given by traditional practitioners to the victims without having either clear benefit or out rightly harm full. The techniques include, 26.2% applying tourniquet, 9.1% incision, 4.9% herbal medications and 7.8% received a combinations. Study in North regions of Ghana- Kintampo showed 77% used the combinations of interventions [14,15].Where as in Nepal, 90% used tourniquet and Bangladish, 80% practiced incision drainage[6,17]. In all cases there is a variation in pre-hospital interventions and this could be due to differences in community experience/practice and the severity of bites. The current study revealed different clinical manifestations of poisoning. Clinical manifestations like cardiovascular system, respiratory system, gastrointestinal system, hematological, integumentary and neurological symptoms were reported in the current study. Respiratory failure and hematological disorders were the main cause of mortality in the study. In this study 86.0% were poisoned, majority of the victims complained local pain 90.2%, local swelling (16.7%), fang mark (21.1%), generalized edema 15.4%, hematological or coagulopathy disorder with local site of bleeding (30.1%) accompanied with gingival bleeding (16.2%) and

epistaxis (13.2%). Hypotension and cyanosis contributed about 36.3% and neurotoxic manifestations develop contributes 35.5% of snake bite patients. In South India researchers reported 55.9% of hemorrhagic symptoms and 97(12.5%) of neurological involvement [24,26]. The difference in clinical manifestations could be described to the species of snake that are existing in the country, age of individuals affected and underline medical care taken.

Using binary logistic regression, the current study indicated that generalized edema was increased the death from snake by 5.9 times (COR, 5.9, 95%, CI: 1.60-22.0); Similar study done In Gana-Kintampo hospital study reported shows 27% of victims develops generalized edema and 12% of develops gum bleeding increases the risk of mortality at ( $p < 0.05$ : 95% CI) [11,12,13]. No death reported in study done in Nigeria; kogi state Lokoja Hospitals from the total ( $n=666$ ) [ 21,15]. However, death was reported in Nepal (20%) and Bangladish (1 case only) [6,17]. Were as study reported in United State of America 9-10/8,000 per annum snake bite case fatality rate were reported [28,29 ].Of 75.6% patients who received ASV in Karntaka hospital, mortality rate was 5.2% [25], were as in Zimbabwe hospital within two years study coverage of ASV 44.6%, the mortality rate was 1.8% [ 19,20 ].In Saudi Arabia;hospitalized death reported 4/1019 (0.3%) [31,32]. The death was increased for those who bitten on the chest by 597 times (COR:597; 95% CI:16.8-21139.2), the abdomen by COR 35.5 times(95% CI :2.1-602.9),whereas the head and face regions by 29.7 times (COR,29.7,95% CI:1.8-504.2) at ( $P < 0.05$ ).The current study result showed that majority of snake bites patients were treated, and 78.4% were improved; were as 17.6 % were referred. On the other hand in our study patients who received ASV 69.9%; Whereas 3 cases (0.3%) was corrective finger amputations were done.Whereas the mortality rate in our study much higher this was 15 cases (4.9%). The increases mortality could be explained by the inaccessibility of ASV . Apparently high mortality rate recorded in our study may be due to delay in arriving at the health center after the snake bite or external factors which increases the chance of mortality who are not receiving first aid, unavailability of Anti snake venom(ASV) at health center, no transport facilities and further more may be lack of public awareness about needs of medical emergency treatment.

## **7. Limitation:**

A retrospective cross sectional study design was employed to conduct this study due to time constraint. All the data was collected from patients' medical record cards. So, it is impossible to get clear and consistent clinical features of patients as all of the information might not be recorded on the cards. There are some features that could only be assessed by observation or by taking history. It might be good to use a prospective study design which may help to overcome the above mentioned problem. There was also difficult to compare findings, due to dearth of study in Ethiopia.

## **8. CONCLUSIONS:**

The prevalence of snake bite in our study area was high. Majority (n=408). 358/408 (87.7%) were males, the male to female ratio is 8:1. The peak age groups 21-30 years( 48.8%) ; 5.6% of bite 10 years. Majority 70.3% were bitten at night time. The mean length of patient's arrival time was to health center 3.6 hours $\pm$ 1.6. The peak incidence of snake bite seasons at the month of June -- November. 57.8% of bite happened at lower extremity followed by the upper limb 31.6%. Majority 69.9% were received Anti- snake venom(ASV), were as 17.6% referred to higher tertiary hospital due to shortage of Anti venom. The most cause of death due to neurotoxic effects on respiratory system and bleeding disorder. There was high mortality rate 4.9%, and 3 cases(0.3%) corrective limb amputation were done.

## **9. RECOMMENDATION.**

### **Public Recommendations**

- ✓ Early transport the victims to any emergency medical care facilities might to reduce the mortality rate.
- ✓ Also gives training for individual to provide first aid emergency medical care.
- ✓ Health educations also a high contribute for provid first aid measurements applying tourniquets preventions that to develop further complications increased tissue damage, necrosis and ischemia.
- ✓ Applying splint with binding the bandages and immobilized the extremity recommended.



### **For health professional**

- To give health educations for the individuals develops good attitude and practiced towards managements and Antivenom is the only specific medical treatment for snake bite envenoming.
- Uses guide lines for managements and protocols.
- The health facilities should full filled and organized emergency service equipments like laboratory equipment materials, Antivenom medications on hand exceeds the number of patients for better evaluations and managements.

### **To the ministry of health:**

Prepared well trained personnel to provide medical emergency care for the individuals addressed as Compiene program in the peak seasons it might reduce the mortality rate and further more complications. Also should be adjusted the accessibility Anti venom and funding to deliver timely and addressed to the victims it may be reduces the referral and mortality rate.

### **To the researchers:**

Advice to more snake bite research done in Ethiopia, there for this is a preliminary study, further investigations should be continued to find out further more this occupational and environmental hazard diseases associated to prevalence outcomes and better management to it might be to reduce the mortality rate.

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## ANNEX I

### OBSERVATIONAL CHECKLIST.

**ADDIS ABABA UNIVERSITY SCHOOL OF HEALTH SCIENCE AND COLLEGE OF MEDICINE ,DEPARMENT OF EMERGENCY MEEDICINE.**

This observational checklist helps to assess the prevalence and outcomes of snake bite patient attending at Abdurafie town a governmental health center and MSF Holland (NGO'S)from January 2011-December2014(Sept 2003-August2006)North West; Gondar, Ethiopia, 2014 GC.

**Table 1.Socio demographic characteristics of SB patients.**

Variable	Sociodemographic variables		Remark
Age	Up to 9 yr.		
	10-19 yrs.		
	20-29 yrs.		
	30-40 yrs.		
	40-50yr		
	>50 yrs.		
Sex	Male		
	Female		
Address	Rural		
	Urban		
Religion	Orthodox		
	Muslim		
	Protestant		
Ethnicity	Oromo		
	Amhara		
	SNNPR		
	Tigri		
	Others		
Educational status	Cannot read and write		
	Can read and write		
	Primary school		
	Secondary school		
	Higher education		
Occupation	Farmer		
	Animal husbanderies		
	House wife		
	Fisheries		
	Plantation		

**Table 2. Attack time and place of snake bite during the study period.**

Sr.no	Time		Place		Remark.
1	day time		In doors		
2.	night time		Out doors		
3	Not identified		Not identified		

**Table 3. Arrival time to health facilities & length of hospital stay From 2011-2014 GC.**

Characterstices			Remark
Within one hour			
1-2 hours			
2-3 hours			
3-4 hours			
4-6 hours			
>6 hours			
Not identified			
1	1-2 days		
2.	3-5 days		
3.	6-8 days		
4.	9-12 days		
5.	13-15 days		
6.	>16 days.		

**Table 5. Anatomical Site of snake bite from January-2011-2014.**

1	Head and Neck region		
2	Upper extremities		
3	Chest		
4	Abdomen		
5	Spinal		
6	Pelvic		
7	Lower extermities		

**Table 6. Seasonal variations in snake bite incidence from 2011-2014 GC.**

Sr.no	Sep	Oct	Nov	Dec	Janu	Feb	March	April	May	Jun	July	Aguest
2011(2003)												
2012(2004)												
2014(2005)												
2015(2006)												

**Table 7. clinical features of snake bite from January 2011-December 2014 GC.**

Local symptom	Local Pain		Remark
	Systemic pain		
	Fang marks		
	Local Swelling		
	Generalized Swelling		
	Local tissue Laceration		
Neurotoxic syptom	Ptosis		
	Limb weakness		
	Dysphagia		
	Bulbar palsy		
	Dyspnea		
Bleeding Disorder	Hematemesis/vomiting		
	Epistaxis.		
	Gingival bleeding		
	Bleeding from venopuncture site		
Sign and symptom of Shock	Hypotension		
	Tachycardia		
	Bradycardia		
	Tachypnea		
	Cyanosis/peripheral/central		

**Table 8.MANAGEMENT OF SB.**

8.1.Prehospitalinterventions had been taken During the study period.

1.Harbal medication		Remark
2.wound incision		
3.unknown IM injectable drug		
4.Torniquet apply		
5.wound dressed		
6.noon		

**Table 8.2.Managment of snake bite patient at health centeramd MSF from January 2011-December 2014 GC.**

At health facility interventions		
1.wound debridement		
2. daily wound care given		
3.Antibiotics		
4.TAT prophylaxis		
5.Anti-venom		
6.blood transfused		
7.IV fluid(colloid)		
8.Analgesia		

**Table 9. Snake bite patient outcome .**

Sr..No	Outcomes criteria(measures)	2011	2012	2013	2014	Remark
1	Improved& discharged					
2	Referred to higher hospital					
3	Local tissue loss					
4	limb amputation					
5	Death					

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