

# Snake Bites: A Public Health Problem Present

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**Abstract:-** This article shows the results of a retrospective analysis study, 2018-2019, with the aim of clinically and epidemiologically characterizing patients with snake bite accidents treated at Huixtla General Hospital, Chiapas, Mexico. The universe of study consists of No. 43 patients. The variables were studied: age, sex, occupation, time of aggression, place and time of aggression, clinical picture, hematological alterations, neurotoxic alterations, type of snake and laboratory studies. Snakebite is a significant occupational risk, especially for field workers, to whom prevention-focused educational campaigns should be run. Appropriate provision of anti-crotalic serum is recommended in hospitals located in risk areas and deepen the formation of health servers in these areas.

**Keywords:-** Snake Bites, Chiapas, Clinical and Epidemiological Aspects.

## I. INTRODUCTION

Snakebite accident, is defined as a skin lesion caused by snake bite, followed by inoculation of toxic substance (poison) that damages tissues, considering alterations pathological pathologies of variable gravity (GPC, 2010). It is considered a public health problem, it is an accidental disease, not infectious or contagious (Zúñiga, 2013).

These accidents continue to be a public health problem, especially in tropical countries (Gutierrez, 2010), as they are habitat environments for the diversity of venomous snakes. According to the World Health Organization (WHO), snake bites are an unattended problem in tropical and subtropical countries. 5.4 million bites occur each year, causing between 81,000 and 137 thousand deaths and approximately three times as many amputations and other permanent disabilities, mainly in countries in tropical and subtropical regions of Africa, Asia, and Latin America (Harrison, 2016).

In the 21st century, rural communities in Africa, Asia and Latin America continue to be the hardest hit, particularly people of productive age (Arnold, 2016).

In Mexico, while it is not one of the biggest health problems, venomous snake bites are common in certain

areas that endanger patients' lives. The main perpetrators of the accidents in Mexico are species of the Genera *Bothrops* and *Crotalus* (Zabala, 2002).

Thus, in Mexico, there is great ignorance of the subject, which causes many cases to be treated inappropriately. Likely, too, much of the population has false traditional beliefs and practices that in addition to being useless, in most cases delay medical care to the point of aggravating the clinical picture of these patients and causing unfavorable results (Otero, 1992).

In addition, some socioeconomic factors generate that in the 21st century, more than a centenary after the anti-chromal serum has been discovered, as a treatment for snakebite, deaths still occur, especially in rural areas with difficult access to adequate and immediate medical care (Sotelo, 2011).

Health professionals must be trained to differentiate these types of emergencies because of the similarity handled by poisonings. For example, knowing how to identify bites of some species such as *Bothrops* and *Asper* that can lead to the death of a patient in 48 hours (Velez, 2017) for lack of rapid care and appropriate treatment of both the type of bite and the type of poison (Naik, 2017).

The morbidity and mortality from snakebite is associated with the unavailability of anti-crotalic serums and late care, these two aspects are part of the problem because cases occur in regions of the country where it will have to be traveled long distances to a center of attention and this associated with difficulties with the means of transport, the economic status of the victim, the situations of the health system such as the unavailability of the corresponding antidote, are factors by which cases with serious and irreversible complications, such as amputations and renal failure, increase, or worse, end in the patient's death (Vera, 2004).

Based on the above, it is the objective of the study to describe the clinical and epidemiological characteristics of patients treated in the medical emergency area of Huixtla General Hospital, Chiapas during 2018 and 2019 by accident by bite of Snake.

## II. METHODS

### ➤ *Research Design*

An observational, descriptive, retrospective study was conducted on the clinical and epidemiological characteristics of snakebite accidents at Huixtla General Hospital, Chiapas, Mexico, during 2018 and 2019.

### ➤ *Description of the Study Area*

The present study was carried out at Huixtla General Hospital is located at km. 1 of the Huixtla-Motozintla road. It belongs to Sanitary Jurisdiction No. VII of the city of Tapachula de Córdova and Ordoñez, has a territorial extension of 7829.39 mts.

It provides medical coverage to 8 municipalities of Sanitary Jurisdiction VII, Mapastepec Acacoyagua, Acapetahua, Escuintla, Villa Comaltitlan, Tuzantán, Huehuetan and Huixtla as head. In addition to providing care and being a reference center of the IMSS Rural Medical Hospitals of Mapastepec and Motozintla.

Study population. This research included 43 patients with official accidents who went to the medical emergency department of Huixtla General Hospital, Chiapas, Mexico, during 2018 and 2019.

### ➤ *Sources of Information*

- The primary source for data collection was epidemiological studies conducted during the entry of cases.
- SINBA-SIS-01-P (daily external consultation sheet), to obtain the number of consultations in the medical emergency department, during the years 2018 and 2019, of the general hospital Huixtla, Chiapas Mexico.
- SIS (Health Information System) for obtaining hospital egress from the medical emergency department, during the years 2018 and 2019, of Huixtla General Hospital, Chiapas, Mexico.
- Clinical records of patients with ophidic accidents taken care of at Huixtla General Hospital, Chiapas, Mexico, during 2018 and 2019.

Data collection. Prior to the execution of this study, the director of the medical unit, the head of teaching and research, the department of epidemiology, the department of statistics and archival of the Hospital were requested for authorization.

The instrument will provide information on general data, age, sex, schooling, marital status, occupation, provenance, religion, pathological personal history, months of reporting of accidents, risk factors, symptoms and signs of the disease.

### ➤ *Processing of Information*

The matrix and interpretation of data was performed with the EPIINFO program, the data processing will be complemented with the programs Microsoft Office Word, Excel, and then perform through that program the respective tables and graphs for analysis, also using the

theoretical framework of the study for its respective interpretation.

### ➤ *Ethical Aspects*

Prior to the data collection, the authorization of the authorities of the General Hospital Huixtla was obtained, in order to make the review of the case files, guaranteeing the confidentiality of the data and the anonymity of the patient's name and responsible for the patient's initials and clinical record number will only be used for identification within the study.

The use of data for purposes other than those authorized for the study will be avoided, the researcher assumes responsibility for ensuring the confidentiality, veracity and quality of the data.

## III. DISCUSSION

Currently, there are no studies in the Costa-Soconusco area of Chiapas state that characterize the morbidity and mortality from snake bites, this work would represent the first to describe the epidemiological clinical pattern of bites snakes in the country.

The issue of snakebite is an unattended line of research at the local, state and national levels and is a phenomenon to which we must pay special attention to the epidemiological, demographic and economic impact it entails for the population. Man's continued contact with snakes makes bite accidents a global cause of human morbidity and mortality (Berguillos Gasion, 2012).

The study found that the highest frequency of snakebite poisoning increases in rainy season, according to the months of the year in which the highest number of accidents occurred (April to October in both years of the study). These results are consistent with those of (Oliveira, 2001), who mentions that snakes usually hide beneath the ground and are forced out of their burrows looking for drier, taller places near the house where they meet Human.

The study observed male dominance with 37 cases (86.0%), relative to female cases with 6 cases (14%), similar to different studies that suggest that in out dig as car accidents the male sex is more likely to get sick, complicate and aggravate, which attributed to the risk occupations they exercise and by not using means of protection (Moreno, 2015).

The age ranges with the greatest affectation were the 25-59 years for the economically active, young and mature population that are involved in agricultural work and are exposed daily to suffer from snake's aggression by invading the environment where these animals live.

In some studies, carried out such as Betancourt (2012), the group of farmers has been classified as the most susceptible to this type of accident, which is consistent with our results where agricultural activity presented the highest number of cases with 29 (67.4 %). It should be noted that

most of the accidents occurred while people were doing agricultural activities involving the movement through the countryside.

The main manifestations presented were edema and pain, mainly due to the proteolytic action of bothropic poisoning (Pardal, 2010), in line with the studies of Villamarín (2009) and Moreno, (2015).

The time when the highest number of accidents were recorded was 06:00 – 11:59 hours with 25 cases (58.1%) similar to what Carrasco found (2013), and is explained by the thermoregulation required in snakes that need external sources of heat to survive and are exposed to the sun's rays especially at the beginning of the day.

Regarding the anatomical site of snake bites, 59% occurred in the lower limbs, coinciding with the study of Sira Hernández (2009), in which more than 55% of the snake bites occurred on the lower limbs and the remaining occurred upper limbs.

This research showed that the time elapsed between the time of snakebite and the application of anti-venom serum in 3 patients was less than 1 hour (6.9%) and 31 patients was between 1 to 6 hours (72.1%). This should be considered as a sensitive data since the longer the longer the more poison has elapsed, the more poison will have been absorbed and the damage will be greater (Alarcón, 2011). In a study conducted by Guzmán (2014), it is mentioned that it should not take more than two hours between the time of the bite and the application of anti-venom serum.

In the municipalities of Escuintla, Acacoyagua, Huixtla and Motozintla where the greatest number of accidents occurred, these municipalities have the ecological conditions conducive to the habitation of snakes forming an adequate balance in the ecosystem (INEGI, 2010).

Among the hematological alterations such as: hematomas, gingival hemorrhage, equimosis and flictenas was present in 12 patients, while in neurotoxic alterations such as blurred vision presented in 4 patients, results consistent with the revised literature (Mechan, 2010). Snake venom is a toxic complex, its clinical effects are directly related to the toxic effect of venom, either through anticoagulant/procoagulant activity or neurotoxic effects, usually containing several digestive enzymes and dispersion factors, resulting in local and systemic lesions.

In the coastal plains of the Pacific and the mother mountain range of Chiapas, the species of venomous snakes are the coralillo (*Micrurus nigrocinctus*; *Micrurus latifasciatus*), cantile (*Agkistrodon bilineatus*), cold nauyaca (*Cerrophidion godmani*), bicolor or ornate nauyaca (*Bothriechis bicolor*), the jumping nauyaca (*Atropoides occiduus*). Most of the cases identified (34.8%), were snakes of the genus *Agkistrodon* (cantile), as the various species of this genus are widely distributed in the state of Chiapas.

Laboratory results in this study such as prothrombin time (Tp) 74% and 58% thromboplastin part-time (TpT) were found prolonged in patients, which is consistent with Guido's study (2001) due to X-factor activation of the coagulation cascade. In this study, 93% of patients had platelets at normal limits.

#### IV. CONCLUSION

- Snake bite accident is a public health problem.
- In the field of research, epidemiological, clinical, biochemical and pharmacological research is needed with the aim of better understanding the mechanism of action of the different poisons due to their local, hemorrhagic, nephrotoxic toxicity, vagal neurotoxicity, neurotoxic of the crotalic poison and crippling.
- Signs, symptoms and severity of ophidic accidents vary in victims according to age, sex, size, prior health condition, injected tissues.
- Signs, symptoms and severity of ophidic accidents vary in victims based on age, sex, size, prior health condition.
- In the snake specimen, the age, size and condition of the tusks, bit site and number, and amount of inoculated venom are the factors that condition the severity of the bites.
- The type of first aid received, availability of qualified hospital medical care, length of time between accident and proper care, environmental factors such as temperature are factors that condition the care and positive evolution of the Patient.

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