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Traditional remedies for snakebite in Sudan

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Abstract

Purpose: The aim of this review is to collect information in the available literature (PubMed central, Google scholar, Science direct and Medline and others) to reflect on the traditional remedies used to treat snakebite in Sudan.

Methodology: This is a systemic electronic database review accomplished by searching randomly selected databases including: PubMed central, Google scholar, Science direct and Medline and others. Data concerning Sudan was selected and written in a narrative descriptive format.

Findings: The data collected was written in a narrative descriptive style including the classification of venomous snakes with specific reference to the magnitude of the problem in Sudan and a reflection on the global magnitude of the problem.

Unique contribution to theory, policy, and practice: Snakebite is considered one of the neglected tropical diseases in the tropical and subtropical regions including Sudan, the heart of Africa. The significance of this problem is related to the fact that the snakebite in Sudan is sometimes sadly fatal and affects the young farmers and herders impacting the agricultural economy which is the backbone of the economy of the country.

Keywords: *Snakebite, Traditional remedies, Sudan, neglected tropical disease, envenoming.*

Highlights:

1. Snakebite, despite its global burden, still it is among the neglected tropical diseases
2. Snake venoms are very potent toxins that can damage vital organs like the nervous system, cardiovascular system and the kidney resulting in death or chronic disability
3. Snakes are of different types, of different geographical distributions, of different behaviors and toxicity. Sudan harpers one of the deadliest snake species in the world, saw-scaled viper (Echis carinatus)
4. Traditional medicines for snakebites are practiced nationwide without matching them with the species of the biting snake

Introduction:

Snake-bite constitutes a well-known public health problem and a medical emergency that was included in the WHO's list of neglected tropical diseases since 2009. The WHO struggled to direct the attention and care of the international communities towards addressing the problem seriously and efficiently through integration, collaboration and effective partnerships. Snakebite is highly prevalent in poor, politically marginalized rural areas [1]. The main problem can be expressed by an interaction between man and snake sharing the same ecosystem. In the farm, man is cultivating food and snake is looking for food or prey, it is a sort of biological competition as the ecosystem will determine the favorable climate for each. This environmental relation needs to be considered to solve the problem radically or efficiently [2].

Methodology:

This is a systemic electronic database review accomplished by searching randomly selected databases including: PubMed central, Google scholar, Science direct and Medline and others. Examples of topics searched included: Types of venomous snakes, neglected tropical diseases, venous snakes in Sudan, snakebites toxicity, morbidity and mortality of snakebites, treatment of snakebites, and prevention of snakebites. Data concerning Sudan was selected and written in a narrative descriptive format.

Findings:

There are three types of venomous snakes: Elapidae, Viperidae and hydrophidae main features and characteristics of which are going be briefed here.

Elapidae are neurotoxic (affecting the nervous system) land snakes with short fixed fangs while some of them are cardiotoxic (affecting the heart) and some are cytotoxic (causing cell lysis). They include cobras, coral snakes. tiger snakes, mambas and kraits. They have a worldwide distribution more intense on the southern have of the world in the tropical and subtropical regions [3]. Viperidae are vasculotoxic (damaging blood vessels) land snakes with long erectile fangs. They are found in most parts of the world. Examples include the Gaboon viper (Bitis gabonica), the puff adder (Bitis arietans) and the Rattlesnakes of which Echis carinatus (saw-scaled viper) is considered the deadliest of all snakes causing a mortality more than that caused by all other snake species combined. Unfortunately, this is available in most of the rural agricultural areas in Sudan. Echis carinatus is characterized by a thermosensitive pit between eye and nostril through which it discovers another human, animal or a prey approaching the zone by detecting the infrared waves emitted by such living organisms [4]. Hydrophidae are myotoxic (damaging the muscles) sea snakes with short fangs and flat tails. Beaked sea snake is very toxic to an extent that only three drops of its venom is enough to kill eight persons at once [5].

Discussion:

The main pathogenesis of snakebite is the injection of the venom into the body of the victim, and this is called snakebite envenoming (SBE). This leads to local (site of the bite) and systemic effects that me be fatal or causing chronic effects resulting in handicap (like limb or digital amputation) or chronic kidney disease necessitating long term hemodialysis. Different venomous snakes have different venoms with different mechanisms of actions like being neurotoxic, cardiotoxic, myotoxic, cytotoxic or antifoulant [6]. In the global health context snakebite envenoming is a challenging, distressing and compelling, nevertheless neglected medical emergency with low-income countries taking the heaviest burden of the problem. According to the World Health Organization (WHO), between 4.5 and 5.4 million snakebites occur each year and 1.8 to 2.7 million of which cause illnesses. Around 81,000 to 138,000 people die each year from snakebites envenoming. People at risk for snakebite include agricultural workers, herders, fishermen and hunters [7]. This is more manifested in Asia, Sub-Saharan Africa and Latin America. Effective tackling of this problem requires collaboration, integration and partnership involving many participants with good global funding and good supervision by the WHO. The main line of life saving treatment is early administration of the antivenom which is not available or available with unaffordable price to most of the victims. Without global cooperation and support this problem can become a humanitarian crisis. Currently this is the approach of the WHO in the form of the Global Snake Bite Initiative of the International Society on Toxicology which needs to be urged and converted into actions [8]. In the year 2019 the WHO adopted a Snakebite Envenoming Strategy for Prevention and Control. The strategy was tasked by the Snakebite Envenoming Working Group (SBE-WG) concentrating on the achievement of a 50% reduction in mortality and disability caused by snakebite envenoming by 2030. This aim will be accomplished through four objectives in terms of engagement of the communities, provision of safe effective treatment, strengthening of the health systems and establishment of an effective partnership [9].

In Sudan the snakebite envenoming appears even more disastrous considering the fragile health system with a downhill going national economy and the state of political instability. The remote areas with poor transportation, lack of security, poverty and ignorance are more susceptible to the impacts of SBE with considerable mortality and permanent disabilities largely not included in official health statistics as most of the victims fail to reach the health facilities for the reasons mentioned above. According to the Sudan ministry of health statistics during 2014-2018 people envenomed by snakebites reached 63160 with a mortality rate of 2,5% with an annual incidence of 18-47 cases/100000 population. The highest incidence of SBE in Sudan was reported in the eastern region (Gadarif state) as 132/100000 population and the lowest incidence was in the north around 5/100000 population. Males are at higher risk of snakebite than females and the favorable age is 15-24 years [10]. The number of Sudanese people working as traditional healers or traditional medicine practitioners is great, especially

in the rural areas where snakebites are prevalent. In some areas in the south a mixture of mboya plant and kpoyo tree (local names) with added salt are given to the victim to induce vomiting thinking of expelling the venom to relieve the patient after which the patient is taken to a ventilated area and pour cold water on the face of the patient for more relief [11]. The bark of Acacia mellifera (Kitir is the local name) is macerated and is used orally as a snake antivenom. The shrub and root of Albizia lebbeck (Arad is a local name) are used as a paste for external use as a snake antivenom. Other medicinal herbs used externally in the form of paste to be used as snake antivenom include Aristolochia indica, Oxystelma esculentum and Acacia foetida.[12] Decoction of leaves and roots of the widely used *Azadirachta indica* used in the treatment of snakebite in Sudan.[13]

Conclusion:

Snakebite is a real challenge, a medical emergency and a neglected health problem in spite of the efforts exerted by the WHO to put it forward as a health priority among the neglected tropical diseases to find care and support from the international community. Epidemiological studies to explore the types and distribution of venomous snake are much below the expectations. Snakebite badly affects the poor community, farmers and herders as well as innocent children in low- and middle-income countries. Children cheaply pay their lives for their small size which increases their risk of toxicity. Mortality and sad disabilities cost the poor people more than they can afford. Traditional remedies are not well studied to prove their safety and efficacy to support the role they play in closing the gap between what poor remote communities need and what fragile weak heath systems can offer.

Recommendations:

1. It is high time to conduct epidemiological studies to provide vital database and achieve improvement and excellence in promoting health and preventing the sad consequences of snakebite.
2. Global support with integrate and coordinated efficient partnerships led by the WHO is urgently needed.
3. Methods of snakebite prevention in a large scale need to be adopted to protect the farmers and herders to support the national economy.

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References:

1. Omer SM, Abdallah MA, Abdallah S, Ali KM, Eltayeb K, Abdalla TM, Adam GK, Ali AA. (2017). International Journal of Healthcare and Medical Sciences; 3 (10):pp76-79
2. Martín G, Carlos Yáñez-Arenas, Rodrigo Rangel-Camacho, Kris A. Murray, Eyal Goldstein, Iwamura T, Xavier Chiappa-Carrar. (2021). Implications of global environmental change for the burden of snakebite. Toxicon;(9).
3. Khalid, H., et al. (2015). "Cytotoxiciy of Naja nubiae(Serpentes: Elapidae) and Echis ocellatus(Serpentes: Viperidae) Venoms from Sudan." Journal of Toxins ;(167492).
4. Aslam N, Fatima S, Khalid S, Hussain S, Qayum M, Afzal K, Asad MH. (2021) Anti-5-Nucleotidases (5-ND) and Acetylcholinesterase (AChE) Activities of Medicinal Plants to Combat Echis carinatus Venom-Induced Toxicities. BioMed Research International.
5. Tan CH, Tan KY, Lim SE, Tan NH. (2015). Venomics of the beaked sea snake, Hydrophis schistosus: A minimalist toxin arsenal and its cross-neutralization by heterologous antivenoms. Journal of proteomics; (126).
6. Patra A, Mukherjee A K, (2021). *Assessment of snakebite burdens, clinical features of envenomation, and strategies to improve snakebite management in Vietnam*. Acta Tropica;(216).
7. Alcoba G, Chabloz M, Eyong J, Wanda F, Ochoa C, Comte E, Nkwescheu A, Chappuis.(2020). *Snakebite epidemiology and health-seeking behavior in Akonolinga health district, Cameroon: cross-sectional study. PLoS neglected tropical diseases*.;14(6).
8. Gutiérrez J M, Williams D, Fan H W, Warrell D A. (2010). *Snakebite envenoming from a global perspective: Towards an integrated approach*. Toxicon.;56(7): pp1223-1235.
9. Oirschot J, Ooms G I, Waldmann B, Kadam P. (2021). Snakebite incidents, prevention and care during COVID-19: Global key-informant Toxicon.; (9).
10. Khalid H, Azrag R S. (2021). *Retrospective hospital-based study on snakebite envenomation in Sudan, Transactions of The Royal Society of Tropical Medicine and Hygiene*.; 115(9): pp 992-997.
11. El Safi A. (2007). *Traditional Sudanese medicine: a primer for health care providers, researchers, and students*. AZZA house.
12. Ahmed IM, Tahir YF, Nour SM & Suliman MA (2020). *Traditional use of medicinal plants among the Barti tribe community in Fangoga area, Sennar State, Sudan.* Tropical Plant Research. 7(2): pp517–521
13. Gamaleldin M, Karar E and Kuhnert N.(2017). *Herbal Drugs from Sudan: Traditional Uses and Phytoconstituents*. Pharmacogn Rev.; 11(22): pp 83–103