A Retrospective Five Year Review of Snakebite In Bida, Nigeria.

A. E. Fawibe,[1] I. O. Ibok.[2]

[1]Department of Medicine, College of Health Sciences, University of Ilorin, PMB 1515 Ilorin, Kwara state, Nigeria. [2] Department of Medicine, Federal Medical Centre, Bida.

Abstract

Snakebite is an important but often overlooked medical emergency which many health institutions in some parts of rural tropics are yet to fully appreciate. This study was undertaken to underscore the important contribution of snakebite injuries to medical morbidity and mortality in Bida, Nigeria. It is a retrospective analysis of snakebite injuries managed at FMC Bida over a period of 5 years. The results showed that snakebite constituted 1.7 per 1000 hospital admission and 15.9 per 1000 medical admission with a mortality rate of 8.9%. Presence of systemic features and complications were significantly associated with death. The menace of snakebite at Bida can be reduced through mass education with respect to appropriate preventive measures, prompt reporting and management of cases with effective and affordable antisnake venom which should be made available in the hospital pharmacy.

Keywords: snakebite, antisnake venom, Nigeria.

Introduction

Of the more than 3000 species of snakes worldwide, about 25 species are known to have caused human deaths in Africa and at least another 30 are capable of causing local pain and swelling or rarely more severe symptoms.[1]

Snakebite is an important medical emergency in some parts of rural tropics; its incidence is usually underestimated because most victims seek the help of traditional healers rather than practitioners of western-style medicine.[2] Although accurate information about the incidence of snakebite morbidity and mortality is extremely difficult to obtain, it is estimated that its worldwide incidence is in excess of 3 million per year with more than 150,000deaths.[3]

In Nigeria, the report of health facilities survey on snakebite in 1994 showed that Taraba state had the highest number of cases with 10.3 per 1000 admission while Osun state had the lowest with 2.7 per 1000 admission. However, the highest case fatality rate was from Jigawa state.[4] Nasidi[5] reported 174 cases per 100,000 population per year, where one species, the *Echis Ocelatus* is responsible for 90% of bites and 60% of deaths. An estimated 10,000 deaths from snakebite occur every year in the savannah region of Nigeria.[6] Mustapha[7] in 2003 reported a mortality rate of 10.6% among 207 patients in Gombe, despite administration of antisnake venom (ASV); while more recently Njoku et al[8] reported a mortality rate of 2.7% in Sokoto. This is far in excess of the mortality rate from Australia which was reported to be only 1-4 persons per year despite being the home of the deadliest snakes in the world, judging by the lethal potency of their venoms.[2,9] Habib et al[10] reported that snakebite is an important but often overlooked medical problem and that many health institutions are yet to become aware of the magnitude of this problem. This work was carried out to determine the important contribution of snakebite injuries to medical morbidity and mortality at the Federal Medical Centre Bida (FMCB), a suburban tertiary health facility in North central region of Nigeria.

Patients and Methods

The record files of all adult patients managed for snakebite at FMCB between 1st January 2002 and 31st December 2006 were retrieved from the medical records department. Relevant information such as biosocial data, site of bite, location of patient at the time of bite, circumstance of bite, presence of local and /or systemic features as well as complications at presentation, type of treatment before presentation, interval between time of bite and presentation, treatment given and outcome (alive or dead) were all noted.

Statistical analysis was done using SPSS version 13.0. The mean ± standard deviation was calculated for the ages while percentages were calculated for the categorical variables. Difference in mean age between those that died and those alive was assessed by t-test. The chi-square test was used to determine the statistical significance of differences in the percentages of

Correspondence to:

Dr A. E. Fawibe
P. O. Box 4923 GPO Ilorin,
240001, Kwara State,
Nigera
Email: drdemola@yahoo.com

the categorical variables of those alive compared to those that died. A p value of < 0.05 was considered significant.

Results

Out of 32,283 total hospital admissions and 3,514 total medical admissions within the study period, 56 patients were admitted for snakebite. Therefore, snakebite constituted 1.7 per 1000 hospital admission and 15.9 per 1000 medical admission within the period under review.

Table 1 shows the baseline characteristics of the patients. They were predominantly males (34; 60.7%) with male: female ratio of 1.6:1. Their mean age was 27.4 ±10.9 years with a range of 15-50 years. Majority of them (41; 73.2%) were between the ages of 15 and 30 years and were predominantly students (24; 42.9%) and farmers (15; 26.8%). Twenty-eight of them (50.0%) were bitten while walking in the dark and 17 cases (30.9%) occurred in farmers or their relations while working on the farm, 5 patients (8.9%) were bitten while sleeping at home in the night and 6 bites occurred under diverse circumstances such as when attempting to wear slippers, during defeacation in bush or while bathing outside at night. The foot was the most frequently bitten site (50; 89.3%); involving the right in 26 patients (46.4%) and the left in 24 patients (42.9%). Five bites (8.9%) occurred on the hands (4; 80% on the right hand) while the head was bitten In 1 patient. Most of the bites (36; 64.3%) occurred between the months of February and June.

Fifty-five (98.2%) of them presented with local features such as pain, swelling and in some cases blisters. Signs of systemic envenomation (bleeding from fang puncture sites, gum, heamaturia or haematemesis) were seen in 13 patients (23.2%). Fifteen patients (26.8%) had traditional (native) treatment before presentation while 5(8.9%) were treated at private clinics before referral. Ten patients had complications such as septicaemia in 3, acute renal failure (ARF) in 1 and systemic bleeding in the remaining 6. Thirty-six patients (64.3%) presented within 6 hours of bite, 4 (7.1%) presented between 6-12 hours, 9 (16.1%) presented between 13-24 hours and the remaining 7 (12.5%) presented after more than 1 day. In all 87.5% of the patients presented within 24 hours of bite.

All the patients with envenomation received polyvalent ASV at various doses, antibiotics, analgesics and tetanus prophylaxis while 4 (7.1%) received fresh whole blood transfusion because of anaemia from continuous bleeding.

Table 2 shows the relationship between presenting features and outcome. Five patients (all males) died giving a mortality rate of 8.9%. Two of those that died presented to the hospital within 6 hours and another one between 6-12 hours of bite. The 3 of them died because they were unable to procure ASV until after some days when fatal complications had set in. The remaining 2 cases of mortality presented to the hospital after 24 hours. Also those that died were younger than those that survived but the difference was not statistically significant. However, the presence of systemic features and complications were significantly associated with death.

Discussion

Snakebite is an important medical condition accounting for 15.9 per 1000 medical admission in Bida. Fifty-six cases of snakebite were seen at FMC Bida over a five-year period. This is probably an underestimation of the prevalence of snakebites in the community. It is possible that more than 15 victims sought the help of traditional healers but that some of them died before they were referred to the hospital. Earlier reports[2,3] have noted the extreme difficulty in obtaining accurate information about the incidence of snakebite morbidity and mortality because most victims seek the help of traditional healers rather than practitioners of orthodox medicine. Njoku et al[8] attributed the main reason for the underestimation of the burden of snakebites in UDUTH Sokoto to the use of secondary health care facility as well as private hospitals. Their finding is different from the observation in this study in which just 5 cases were treated at private clinics before referral to our centre despite the absence of secondary care facility in Bida during the period covered by this review.

The biosocial characteristics of the patients were similar to findings from other studies. [7,8,11] Most of the bites occurred in the healthiest and most productive segment of the population. Virtually all bites occurred on the feet and hands. This underscores the importance of wearing protective clothing, boots and gloves especially while farming or walking in the dark. Majority of the bites occurred between February and June. The intense heat between February and April in Bida may drive snakes from open Savannah to the inhabited areas that are cooler

Table 1: baseline characteristics of snakebite victims in Bida.

Characteristics	Number (%)
Gender	
Males	34(60.7)
Females	22(39.3)
Mean age ± SD (years)	27.4±10.9
Age range (years)	
15-20	20(35.7)
21-30	21(37.5)
31-40	7(12.5)
41-50	8(14.3)
Occupation	
Students	24(42.9)
Farmers	15(26.8)
House wives	8(14.3)
Cattle rears	3(5.4)
Civil servants	3(5.4)
Others	3(5.4)
Circumstances of bite	
Walking in the dark	28(50.0)
Working on the farm	7(30.9)
Sleeping at home	5(8.9)
Others	6(10.2)
Site of bite	
Right foot	26(46.4)
Left foot	24(42.9)
Right hand	4(7.1)
Left hand	1(1.8)
Head	1(1.8)
Presenting features*	
Local	55(98.2)
Systemic	13(23.2)
None	1(1.8)
Treatment prior to presentation	
Traditional	15(26.8)
Orthodox	5(8.9)
None	36(64.3)
Complications	
Septicaemia	3(5.4)
Acute renal failure	1(1.8)
Systemic bleeding	6(10.7)
None	46(82.1)

***All patients with systemic features also have local features**

because of shades and houses. On the other hand, the months of May and June correspond to onset of rainy season when Bida farmers flock into the fields to till the land. This increase in risk of snakebites which is closely related to temperature and rainfall has been reported by other studies.[8,12]

Majority (87.5%) of the patients presented within 24 hours of bite in this study. A shorter time to presentation interval has been shown elsewhere[8,13] to be correlated with more favourable outcome. Pugh and Theakston[13] reported a survival of 88.5% among hospitalised carpet viper snakebite victims in Northern Nigeria and more recently, Njoku et al[8] reported a rate of 97.3% among snakebite victims given polyvalent ASV in a similar setting. However, the early presentation of snakebite victims to FMC Bida did not show any statistically significant association with survival. This is because 3 of those patients that presented within 24 hours of bite were unable to procure ASV until after some days when systemic features and fatal complications had occurred. The crises of ASV supply to Sub-Saharan Africa have been widely reported in earlier studies.[14,15] Of about 1.5-2 million doses of ASV needed per year, <20,000 ampoules/year were supplied to Africa.[16] Nigeria, Africa's most populous country, requires an estimated 245,000 vials.[5] This situation is further compounded by our national statistics which tends to overlook rural emergency problems, including snakebites. All these conspired to make ASV very expensive and sometimes unaffordable. Therefore, larger quantities of good quality and affordable ASV are

Table 2: relationship between presenting features and outcome among snake bite victims in Bida

Variable	Alive Number (%)	Dead Number (%)	X^2	P value
Mean age±SD(years)	27.8±10.7	22.8±14.2		0.34(NS)
Gender				
Male	29(51.8)	5(8.9)		
Female	22(39.3)	0(0)	3.55	0.06(NS
Time interval [a]				
<6hours	34(60.7)	2(3.6)*		
6-12hours	3(5.4)	1(1.8)*		
13-24hours	9(16.1)	0(0)		
>24hours	5(8.9)	2(3.6)	5.98	0.11(NS)
Treatment [b]				
Traditional	12(21.4)	3(5.4)		
Orthodox	4(7.1)	1(1.8)		
None	35(62.5)	1(1.8)	4.69	0.10(NS)
Systemic features				
Present	9(16.1)	4(7.1)**		
Absent	42(75.0)	1(1.8)	9.93	0.002(S)
Complications				
Present	6(10.7)	4(7.1)**		
Absent	45(80.4)	1(1.8)	14.45	0.001(S)

Key
SD=standard deviation
[a] Time interval between bite and presentation at FMC Bida
[b] Treatment received by patients before presentation at FMC Bida
NS= not significant
S=significant
***Did not procure antisnake venom until after fatal complications developed**
****Three patients with systemic bleeding and the only patient with acute renal failure died**

urgently needed. In addition, the system must ensure effective distribution to affected areas. This may help to prevent deaths in those who report early to health care facilities since systemic effects of snakebite are readily reversible by appropriate ASV unless a fatal complication has already supervened. Since effective snakebite treatment can achieve mortality rates < 2%, [17] hospital mortality rates above this (such as 8.9% in this study) should prompt further investigations for correctable causes.

The interpretation of the results of this study is limited by some factors. One of these is the retrospective nature of this work which made it difficult to ensure that all the victims were subjected to similar treatment conditions. For example, 3 patients died because of delay in procurement of ASV. Secondly, the 56 cases reported in this review is probably an underestimation of the burden of snakebite in the community because some patients that presented to traditional healers might have died there.

In conclusion, snakebite is an important cause of morbidity and mortality in Bida. This problem can be reduced through mass education with respect to wearing of appropriate protective materials, avoidance of night walking without a light, keeping a clean surrounding, prompt reporting and management of cases with effective and affordable ASV. The hospital management should also ensure availability of ASV within the hospital pharmacy (particularly during the peak period of bite) and the hospital policy of providing emergency services for patients within the first 24 hours of arrival, irrespective of their financial status, should include ASV for snakebite victims.

References

1. Warrel DA. Animals and disease in Parry EHO(Ed). Principle of Medicine in Africa. Oxford University press, 2nd edition; 1984: 110-121.
2. Warrel DA. Injuries, envenoming, poisoning and allergic reactions caused by animals in Warrel DA, Cox TM, Firth JD, Edward JB(Eds). Oxford Textbook of Medicine 4th edition (PDF version), Oxford University press, March 2003: 163.
3. White J. Bites and stings from venomous animals: a global review. Ther Drug Monit 2002: 65-68.
4. National Snakebite Control Programme. Preliminary report presented by Benebo NS at Annual meeting of states epidemiologist, Kano 27th June-1st July 1994.
5. Nasidi A. snakebite as a serious public heath problem for Nigeria and Africa. Presented at WHO Consultative Meeting on Rabies and Envenomings: A Neglected Public Health Issue, Geneva, Switzerland 10th January 2007. http:www.who.int/bloodproducts/animal_sera/A.Nasidi.pdf (accessed 14th November 2007).
6. Pugh RN, Theakston RD. Incidence and mortality of Snakebite in Savannah Nigeria. Lancet 1980; 2(1): 1181-1183.
7. Mustapha SK. Snakebite in Gombe. Highland Medical Research Journal 2003; 1(4): 22-26.
8. Njoku CN, Isezuo SA, Makusidi MA. An audit of Snakebite injuries seen at Usmanu Danfodiyo University Hospital Sokoto, Nigeria. Nig Postgrad Med J 2008; 15(2): 112-115.
9. Stewart CJ. Snakebite in Australia, first aid and envenomation management. http:www.hotkeepers.Com/aho/pdf/menu6/stewart2003.pdf (accessed 12th January 2005).
10. Habib AG. Trends in snakebite pattern in Zaria, Northern Nigeria. A 10year retrospective study ? presented at Nigerian Medical Association conference at NTI conference centre, Kaduna 22-26 April 1992.
11. Opadijo OG, Omotoso ABO. Snakebite in Ilorin: A review of 115 cases. Nig Med Practitioner 1996; 32(4): 30-32.
12. Hansdak SG, Lallar KS, Pokhavel P, Shyangwa P, Karki P, Koirala S. A clinico-epidemiological study of Snake bite in Nepal. Tropical Doctor 1998; 28: 223-226.
13. Pugh RNH, Theakston RDG. A clinical study of Viper bite poisoning. Annals of Tropical Medicine and Parasitology 1987; 81: 135-149.
14. Theakston RD, Warrel DA, Griffiths E. Report of a WHO workshop on the standardization and control of antivenoms. Toxicon 2003; 41: 541-557
15. Gutierrez JM, Theakston RD, Warrel DA. Confronting the neglected problem of Snake bite envenoming: the need for a global partnership. PLoS Med 2006; 3: e150.
16. Stock RP, Massougbodji A, Alagón A, Chippaux JP. Bringing antivenoms to Sub-Saharan Africa. Nat Biotechnol 2007; 25: 173-177.
17. Visser LE, Kyei-Faried S, Belcher DW. Protocol and monitoring to improve snake bite outcomes in rural Ghana. Tran R Soc Trop Med Hyg 2004; 98:278-283.