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Research Article

Epidemiology, Clinical Profile & Outcome of Stings and Bites in Children Admitted to A Tertiary Care Hospital

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Abstract

This study was done to determine the socio-demographic pattern, nature of the bite, clinical profile, the management issues and the outcome of the patients with bites and stings admitted to a tertiary care center. A prospective study on all children admitted with a history of sting/bite was considered. Information on demography, nature of bit, clinical features, examination, investigations and the management were obtained.

A total of 103(1%) children were considered. Mean age was 5.75±3.69 years. The aetiology for the bites and stings were unknown in 34% followed by snake (29%) and Scorpion bite (20.3 %). Majority (82.7%) of bites were unprovoked and occurred indoors (63%). Majority (75%) of patients with snake bite had prolonged Whole Blood Clotting Time (WBCT). Anti-Snake Venom (ASV) was given to 75% of snake bite patients and 76% of patients with white scorpion bite received prazosin. All patients recovered completely without sequalae.

Keywords: Bites and Stings;Children; Northern Sri Lanka; Snake Bite; White Scorpion Bite

Introduction

Children are a vulnerable population for getting bitten by insects, animals and reptiles. They usually get admitted to hospital with a history of bite mostly of unknown etiology. According to the hospital statistics 304 snake bites reported in teaching hospital Jaffna from 2009 to 2010 [1]. Several children and adults lost their lives due to white scorpion sting during the period from 2000 to 2003 [2].

Studies among children are limited and have not been reported in Sri Lanka with snakebite or any kind of bite. Hospital admissions due to any kind of animal bite including an unknown bite has increased over the years reflecting the acceptance of allopathic management and treatment of these bites, as a result of energetic health educational programmers. However, the lack of consensus on management issues in a hospital setting has been a major concern. Envenoming from snakebites is an important public health problem in many tropical and subtropical countries. Research estimates that at least 421,000 envenoming's and 20,000 global deaths occur each year in these areas due to snakebite [3]. Snake bite is a major problem in Sri Lanka where recent decades of warfare and economic sanctions have complicated its management. A descriptive study of offending species and epidemiology of snake bites of two areas in the dry zone of Sri Lanka shows 196 (64%) were envenomed and majority of snake bites were saw-scaled viper bites (52%) in Jaffna. In fact, even bites of venomous snakes are often not life threatening. [1]

Scorpion envenomation is an important public health hazard in tropical and sub-tropical regions. Out of 1500 scorpion species known to exist, about 30 are of medical importance. Although a variety of different scorpion species exist, majority of them produce similar cardiovascular effects. Stings by the white scorpion (Hottentotta tumulus) have been widely prevailing in the Northern part of Sri Lanka. Interestingly this has been specific for this area since the beginning of 90s. Scorpion venom is a potent sympathetic stimulator. Alpha receptors stimulation plays a major role in evolution of myocardial dysfunction and acute pulmonary edema in victims of scorpion sting and Prazosin-an alpha adrenoreceptor antagonist-is antidote to venom action. Time lapse between the sting and administration of Prazosin for autonomic storm determines the outcome [4].

Most insect bites are harmless, though they sometimes cause

discomfort. Bee, wasp, and hornet stings and fire ant bites usually hurt. Mosquito, flea, and mite bites usually itch. Some people have more severe reactions to bites or stings. Babies and children may be more affected by bites or stings than adults. Examples of problems that are more serious include severe allergic reaction. The aim of this research was to study the socio-demographic pattern and clinical profile of any kind of bite except dog and cat bite in children who were admitted to teaching Hospital Jaffna.

Methods

This prospective study amongChildren was done in all Pediatric wards at the Teaching Hospital, Jaffna, Sri Lanka. All children aged ≤12years admitted with the history of bite were considered sequentially. The study was conducted over a period of one year from March 2014 to March 2015.Patients with history of dog or cat bite were excluded from this study. A pretested questionnaire was used to collect the demographic details, prehospital care and clinical features. The investigators who were trained prior examined the children and took details regarding the investigations and hospital care by interviewing the doctors and looking at the patient's case notes.

Demographic factors included age and sex, epidemiological factors such as type, situation and time of bite. The prehospital care factors were assessed by getting details regarding first aid measures, taking the child to traditional medical practitioners, application of any home remedies and the time taken to come to the tertiary center. Investigations done in the hospital was recorded using the data record sheets and details of management were assessed.

Patients who were admitted to hospital with history of snake bite were managed according to the Guidelines for the management of snakebite in hospital-2013 which was produced by the Expert Committee on Snakebite Sri Lanka Medical Association. A course of 10 vials of polyvalent snake antivenom (ASV) was given intravenously at the systemic signs of envenomation and or a prolonged Whole Blood Clotting Time (WBCT) and was repeated every 6 hours as long as these signs persisted. The adverse reactions to ASV were observed. Mild reactions were considered when the patients developed an urticarial rash and severe when they had evidence of anaphylaxis and shock.

Envenomation features of the White scorpion (*Hottentotta tumulus*) were classified as grade I, II and II based on the local reaction, systemic evidence and life threatening envenomation. Pain, numbness and swelling were considered as local reactions. Systemic features were profuse sweating, salivation, cold extremities, tachycardia and hypertension. Life threatening features were pulmonary edema and convulsions. Grade II and III received prazosin 125-250microgram (0.4mg/kg/day) every 6-8hourly until the symptoms resolved.

All patients were followed up until they were discharged from the hospital to assess the outcome. Written informed consent was obtained from the parents and accent from the children. Approval was obtained from the Faculty of medicine Ethical Review Board (J/ERC/14/50/NDR/0078). Data of all the enrolled children were collected and analyzed using the Statistical Package for Social Science version 20.

Results

A total of 103(1%) out of 10762 children were hospitalized as a result of stings and bites from January 2014 to January 2015. The mean age was 5.75±2.69 years. Male: Female ratio 1.02:1. The situation of bite was unprovoked in sixty-seven (82.7%).The geographical region was inland mainly for the snake bites and coastal for the scorpion bites. (Table 1) shows the various types of bites and the geographical location.

Type	Inland	Coastal area	Total
Snake	19	11	30 (29%)
Scorpion	4	17	21 (20.3%)
Bees/ Wasps	5	4	9 (8.7%)
Centipede	2	3	5 (5%)
Big ant	2	1	3 (3%)
Unknown	26	9	35 (34%)
Total	59	44	103

Table 1: Distribution of Types of Bite and the Geographical Area.

Sixty-five (63%) of the bites occurred indoor and 43.2% of the situations the children were sleeping. Eighty-one situations were unprovoked whereas only 22 (21%) were provoked.

Seasonal variations were associated with bites. Peak incidents of snake bites occurred in May which is the hot season where the temperature went up to 38°C meanwhile scorpion bites were high in rainy season mostly November recorded highest rainfall of 100mm.(Table 2)summarizes the pre-hospital care given to these patients.

Feature	Number (%)
Time of admission	
<2 hours	87(84.5%)
>2 hours	16(15.5%)
First aid	
Given	41(39.8%)
Not given	62(60.2%)
Traditional physician	
Seen	10(9.7%)
Not Seen	93(90.3%)
Home remedies	

Given	40(38.8%)
Not given	63(61.2%)

Table 2: Pre-Hospital Care in Patients.

The first aid that was given was immobilization with splinting and washing the area with soap and water. Some of the home remedies were application of turmeric, toothpaste and caustic lime. A total of 30 children were admitted to hospital following snake bite. Envenomation features were seen in 23 (75%) of the patients. The poisonous snake was identified in 16 (70%) and the commonest snake was saw scaled viper (*Echiscarinatus*-) in 44% [2], Russell's Viper (*Daboia russelli*)in 25% [5] followed by the Krait (Bungarus caeruleus) in 3 cases and Cobra (*Najanaja*) in 2 cases.

Features of envenomation with local reaction were seen in 8 (27%) snake bites with severe necrosis seen in two cases bitten by cobra. Systemic manifestation of ptosis was seen in 4 (13.3%), breathing difficulty in 4 (13.3%) and bleeding manifestation in 10 (33.3%). 23 patients (75%) had prolonged Whole Blood Clotting Time (WBCT) of more than 20 minutes. Five patients received ICU care and two needed respiratory support. Twenty-three patients received the Anti Snake Venom (ASV) and 16 (70%) had a reaction to the ASV. Mild reactions were seen in 14 (61%) patients and severe reactions in 2 (8.6%). The mild reactions were treated with chlorpheniramine and hydrocortisone. The severe reaction was treated with IM adrenaline and needed ICU care.

None of the patients received a second dose of ASV. Seven patients (30%) patients had prolonged WBCT without systemic features of envenomation received Fresh Frozen Plasma (FFP) after one dose of ASV. Twenty-one children were admitted to hospital following white scorpion sting. The demography, clinical profile and response to treatment are given in (Table 3).

Feature	Number
Mean age	4.5±1.6 years
Male: female	1:1.01
Mean duration of hospital stay	2.1±0.9 days
Area of bite	
Hand	10 (47.6%)
Foot	8 (38%)
Other	3 (14.2%)
Grade of envenomation	
I	5 (23.8%)
II	14 (67%)
III	2 (9.5%)
Location of care	
Ward	13 (62%)
HDU	6 (28.5%)
ICU	2 (9.5%)
Treatment modalities	
Prazosin	16 (76%)
Outcome	
Recovered fully	21 (100%)

Table 3: Socio-Demographic and Clinical Profile of Children Admitted with White Scorpion (Hottentotta tumulus) Bite.

The commonest form (34%) of bite was the unknown aetiology. Children were brought in mainly due to fear of snake bite in 90% of the time. Mean duration of hospital stay was 1.8±0.9 days. Local reaction of pain and swelling was seen in 30 (79%) of the time and 25 (65%) of the patients received regular pain killers and 10 (26%) received chlorpheniramine and prednisolone for possible allergic reactions following the unknown bite. All the patients recovered without any sequalae. All the patients who were admitted following bees and wasp sting received treatment with chlorpheniramine for allergic reactions and were discharged without any complication.

Discussion

Children are a vulnerable population for bites and stings. Snake bite is not a less common problem in Sri Lanka. There is a retrospective study of snake bites done in north-east Sri Lanka in 2005 which covered all age groups. But there are no prospective studies carried out in this region within pediatric population. And this is the first study in which all bites in children were observed prospectively.

In this study, all patients admitted with the history of bite recovered completely without a sequalae. Majority of the patients were managed in the general pediatric wards and ICU care was given to 7% of patients. There were no deaths recorded. A retrospective study of snakebites was done in north- east Sri Lanka which revealed out of 303 victims including both adults and children, one died after the hospital admission [6]. A retrospective study done on white scorpion bite at Teaching hospital Jaffna during 2010-2012 also showed no deaths among 170 victims [7].

Most of the bites were unprovoked, occurred indoor and occurred at night. Even though majority of our patients did not know the aetiology of the bite but were afraid of snake and got admitted to hospital. A previous study says that epidemiological studies in Sri Lanka have shown a distinct pattern of krait bites among victims [8]. They occur predominantly at night and when the victim is asleep. The study also recommended to sleep above ground level (at least 1 foot above ground) and also to use mosquito nets with its edges tucked under the mattress to cause a physical barrier.

Sixty-seven (84%) patients were brought to the hospital

within 2 hours. A previous study 'Snake bites in north east Sri Lanka' shows 39% of victims arrived at hospital within 1 hour of the bite [6]. A descriptive observational study was carried out in India which revealed 33.08% patients reached the health care unit within 1 hour of bite and 48.84% within 1 to 6 hours after bite. Timely admission to hospital in our study and no mortality suggests that knowledge regarding the treatment options of snake bite is good.

Present study revealed majority (60%) of the caregivers had not practiced first aid soon after the bite. This shows there is a lack of knowledge among people regarding first aid. A descriptive observational study which was carried out in a Teaching hospital in India observed pre-hospital care in the form of application of tourniquet (40.82%), local application of lime, chilies, herbal medicine etc. (30.49%), incision over bite (2.32%) and sucking over site of bite (1.29%) [9]. It is noted in our study that none of the above mentioned were practiced and application of home remedies were done only when the nature of bite was unknown. Correct form of first aid was given to those who received it hence the knowledge about first aid was good even though it was not practiced in all patients. And this study recommended starting awareness programmes in community level regarding the pre-hospital care and first aid.

Majority (75%) of the snake bites showed signs of envenomation some being serious needing ICU care. All patients who demonstrated signs of envenomation received ASV. All the patients received only one dose of ASV and 70% of the patients who received ASV had a reaction to it. This clearly demonstrates that the ASV that is available in our country is not suitable and an ASV particularly to our country is needed. According to a study done in 2005, 60% of snake bite patients received ASV [6]. Apart from the snake envenomation the white scorpion is highly venomous in this region.

76% of the children bitten by the white scorpion showed signs of envenomation. All the patients were managed with prazosin and they recovered uneventfully. This clearly shows that prazosin is a lifesaving drug in the management of white scorpion sting as during the 2000-2003 periods several children died due to the lack of knowledge of this drug at that time [2]. According to this study the mean duration of hospital stay for snake bite is 3.5±2.41daysand for unknown bite is 1.95±1.27days. Analysis showed there was no correlation between duration of stay with type of bite ($p = 0.104$) or snake species ($p = 0.3$). There was no correlation between time of admission and mean duration of stay. ($p = 0.104$)

In conclusion, this study showed children with a history of sting or bite arrived in hospital in time. Even though the pre-hospital care was limited the patients survived without a sequale. Features of envenomation was seen in snake and scorpion bites but the unknown nature was benign. Majority of the patients who received the ASV showed signs of reaction.

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References

1. Sivansuthan S, Kularatne SAM, Maduwage KP, Ratnayake HMCD, Paranagama R, et al. (2011) A Descriptive Study of Offending Species and Epidemiology of Snake Bites of Two Areas in the Dry Zone of Sri Lanka, Anuradhapura and Jaffna Peradeniya University Research Sessions 16: 99.
2. Sathiadas MG, Dinamithra P (2013) White scorpion stings in children-experience from Teaching Hospital Jaffna Proceeding of the annual scientific sessions of Jaffna medical association: 26
3. Kasturiratne A, Wickremasinghe AR, de Silva N, Gunawardena NK, Pathmeswaran A, et al. (2008) The Global Burden of Snakebite: A Literature Analysis and Modelling Based on Regional Estimates of Envenoming and Deaths. PLoS Med 5: e218.
4. Bawaskar HS, Bawaskar PH (2003) Clinical Profile of Severe Scorpion Envenomation in Children at Rural Setting in India. Indian Pediatrics 40: 1072-1081.
5. Kassiri H, Naghibzadeh R, Kavosi-Asl P (2012) An Epidemiological Study of Patients with Snake Biting in the Health Centre, SW Iran. Asian Journal of Animal and Veterinary Advances 7: 268-272.
6. Whitehall JS, Yarlini, Arunthath, Varan, Kaanthan, et al. (2007) Snake bites in north east Sri Lanka' Rural and remote Health 7:751.
7. Thakshagini M, Rajeshkannan N, Murugananthan A, Kannathasan S (2014) A retrospective study on scorpion stung patients admitted to the Teaching hospital Jaffna Jaffna science association: 37.
8. Chaturaka Rodrigo, AriaraneeGnanathasan (2011) Prevention of Krait bites by promotion of sleeping above ground level and bed net use'Sri Lanka, Department of Clinical Medicine, Faculty of Medicine, University of Colombo.
9. Wanjesudhir D, GadekarRamhau D (2011) Clinical profile of snake bite. Journal of Fundamental and Applied Life Sciences 1: 93-99.
10. Jarwani B, Jadav P, Madaiya M (2013) Demographic, epidemiologic and clinical profile of snake bite. Journal of Emergencies, trauma & shock 6: 199-202.
11. Singh J, Bhoi S, Gupta V, Goe A (2008) Clinical profile of venomous snake bites in north Indian military hospital. Journal of Emergencies, trauma & shock 1: 78-80.
12. Saravu K Somavarapu V, Shastry AB, Kumar R (2012) Clinical profile species specific severity grading and outcome determinants of snake envenomation. Indian Journal of Critical Care Medicine 16: 187-192.