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SCORPION ENVENOMATION :AN EXPERIENCE WITH CHILDREN AT RABIGH GENERAL HOSPITAL, KSA

Mohammad H. Al-Hemairi, Fazlur Rahim, Abdullah Al-Shamrani, Saad Hashmi, Sultan Qasim.
Department of Pediatric, Rabigh General Hospital Kingdom of Saudi Arabia

ABSTRACT

Objectives: To evaluate the epidemiological and clinical characteristics of scorpion envenomation in children.

Materials and Methods: It was an observational descriptive study for children 11 yrs of age or younger , was carried out, who presented or reffered to emergency department at Rabigh General Hospital due to documented scorpion stings from February 2007 to July 2011.

Results: A total of 41 cases of scorpion envenomation were observed during the study time period. The mean age was 5.4 years ranging from 9 months to 11 years. Male patients were 22 (53.6%). The peak frequency of scorpion stings was observed in the month of June .Most of the stings were on exposed parts of the limbs mainly lower limbs in 30 patients (73%). Local signs (Redness & Swelling) and pain were the most common clinical manifestations seen in 61% of patients. Most common systemic manifestations were restlessness and irritability (31.7%) followed by vomiting (26.8%) and cold extremities (19.5%). All our patients received scorpion antivenom according to guidelines of Ministry of Health Saudia Arabia. One child died while others were discharged within three days of post admission.

Conclusion: Although most of scorpion envenomations in children have a good prognosis, severe complications and death may occur.

Key Words: Scorpion, envenomation, antivenom.

INTRODUCTION

About 1400 species of scorpions are found worldwide[1,2,3]. In Saudi Arabia, there are 23 species and 3 subspecies[4]. Among them, the most common are *Leiurus quinquestriatus*, *Androctonus crassicauda*, and *Apistobuthus pterygocercus*[5]. *Leiurus quinquestriatus*[6] venom is highly cardiotoxic and can cause death within 24 hours[7,8,9]. Globally, around 5000 mortalities occur due to scorpion stings every year[10,11]. Different studies about scorpion stings were done in different parts of Saudi Arabia[12,13,14] but less information is known about scorpion envenomation in children.

The purpose of this study was to know about the scorpion sting syndrome in children at Rabigh area because children with scorpion stings are at increased risk for severe illness[1] with autonomic dysfunction (restlessness, abdominal cramps, urinary incontinence and sweating), multisystem organ failure and death[15]. Mortality in these children can be prevented with appropriate supportive care and probably early antivenom administration[16,17].

Address for Correspondence:
Dr. Mohammad H. Al-Hemairi
Consultant
Pediatric Department,
Rabigh General Hospital KSA,
P.O. Box 251, Rabigh 21911
Cell: 00966557655767
Email: alhemairi-m@hotmail.com

Although the number of our patients is small, we liked to present our own experience in this area because as far as we know, no similar study was conducted in this area. This study represents children 11 years of age or below presented to emergency room. Furthermore, some children with mild envenomation were managed only in primary health care centers, especially those who lives in villages far from the hospital and either were not reffered to hospital or refused to go to hospital.

MATERIAL AND METHODS

This was an observational descriptive study conducted at Rabigh General Hospital, Kingdom of Saudi Arabia. Many children were seen in emergency room or referred from primary health care centers to the hospital during the period from February 2007 to July 2011 because of scorpion sting. Only those with documented scorpion stings were included in this study. Documentation of scorpion sting was by direct visualization of scorpion by the child,a family member or a bystander plus the clinical picture.

All children were admitted according to the hospital policy. Data were extracted from the files of our patients regarding age, sex, site of scorpion sting, time lapsed from the event till seeking medical advice either in primary health care or hospital, month of the sting, the clinical manifestations, doses of scorpion antivenom, duration of hospital stay and outcome. The

data was analysed and the results were compared with other studies. The scorpion antivenom used was the Polyvalent Scorpion Antivenom (Equine) produced by the National Antivenom and Vaccine Production Center,Saudi Arabia. It was administerd by diluting 3-5 ampoules in 20-50 ml of half normal saline and infused over 30 minutes and the dose was repeated if necessary up to 20 ampoules.

RESULTS

A total of 41 patients were studied with 22 (53.65%) male and 19 (46.34%) female children, age range was from 9 months to 12 years (mean 5.4 years). 48.7% of children were from 1-3 years of age. The number of scorpion bites over various months is shown in Figure 1.

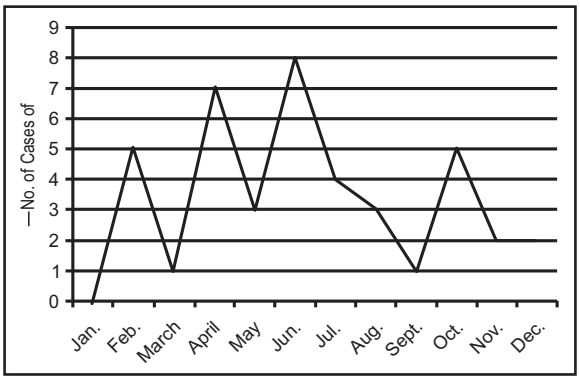

Fig 1

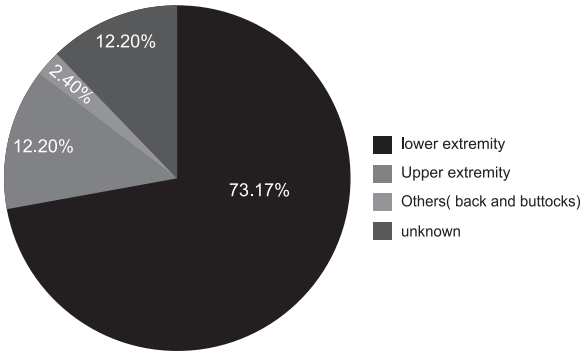

Fig. 2

Majority of the cases were bitten on limbs especillay the exposed areas of limbs, details of which are shown in figure 2. Delay in seeking medical advice (either in primary health care or in emergency room is shown in Table 1. A 11 years male child who presented to emergency department 1 hour after being stung by a yellow scorpion died while playing as reported by his friends. He was carried to the hospital and presented with marked irritability, altered level of consciousness, hypersalivation, cold extremities and shock state unresponsive to supportive measure, he went into arrest in emergency room and was intubated and mechanically ventilated before shifting to ICU, he

Table 1: Patients parameters

Age	**No. of patients & percentage**
<1 year	1 (2.4%)
1-3 years	20 (48.7%)
3-5 years	6 (14.6%)
5-7 years	7 (17%)
7-9 years	6 (14.6%)
9-11 years	1 (2.4%)
Clinical manifestation	
local pain (children > 3 years,	25 (51%)
Vomiting	11 (26.8%)
Cold extremities and sweating	8 (19.5%)
Convulsion	1 (2.4%)
Restlessness, irritability	12 (31.7%)
Pulmonary edema	3 (7.3%)
Priapism	3 (13.6%)
Doses of scorpion antivenom given (ampoules)	
3 ampoules	4 (9.8%)
5 ampoules	26 (63.4%)
6 to 10 ampoules	10 (24.4%)
> 10 ampoules	1 (2.4%)
Delay in seeking medical advice (PHC or ER)	
< 30 minutes	11 (26.8%)
3 min-1 hour	8 (19.5%)
1 hr-1.5 hr	4 (9.8%)
1-hr-1.5 hr	9 (22%)
1.5 hr-2 hr	3 (7.3%)
> 3 hr	2 (4.8%)
unknown	4 (9.8%)
Blood sugar on presentation	
(mg/dl)	
70-100	1 (17%)
101-150	13 (31.7%)
151-200	9 (22%)
201-300	6 (14.6%)
> 300	2 (4.8%)
unknown	4 (9.8%)
Duration of hospitalization	
1-3 days	40 (97.6%)
3-6 days	1 (2.4%)
Outcome	
improved	40 (97.6%)
death	1 (2.4%)

went into deep coma. His chest X-ray showed marked pulmonary edema and was given 15 ampoules of scorpion antivenom during the first 3 hours of presentation and died 2 weeks after admission due to irreversible shock and DIC. The delayed presentation and the severity of clinical picture on presentation seems to be responsible for this mortality.

DISCUSSION

Rabigh is located on the western coast of Saudi Arabia. The total population in the city and surrounding villages is 92,000 habitant according to natioal census in 2010 and it has an area of 8000 km. It is a semi dessert area , infested with scorpions. Although the number of our patients is small, we liked to present our own experience in this area because as far as we know, no similar study was conducted in this area. This study represent only children 11 years of age or below presented to emergency room. Furthermore, some children with mild envenomation were managed only in primary health care centers-especially those who lives in villages far from the hospital and are not referred to hospital or refuse to go to hospital.

The age range in our study was from 9 months to 11 years with mean age of 5.4 years.This is lower than the mean age reported in two studies from Saudi Arabia in which it was 6.4 and 6.29[9,13] respectively for the similar age group while it is higher than the mean of 4.8 years reported in Morocco for a similar age group[20].

Although it may not have clinical significance, and no difference in severity of cases was found[21], the percentage of male patients was slightly higher in our study with a male to female ratio 1.15:1. Male predominance in children with scorpion sting was reported in different studies with a male to female ratio predominance with a range from 1.9:1[22,23,24]. Female predominance was also reported[16,22-25].

The site of scorpion sting in our study was mainly in the exposed parts of limbs amounting to 85.37% of cases which is not different from other studies[12,13,16,26-28,29-31]. In our study, the monthly distribution of scorpion stings was predominant during the warm and hot seasons of the year with a peak in June. This is similar to the results found in different studies in Saudi Arabia[4,6,14,19] and worldwide[16,25,26,31-33]. Furthermore, fatalities due to scorpion stings were more in summer months in Mexico[1].

All our patients received scorpion antivenom according to Ministry of Health Guidelines in Saudi Arabia.Similarly,all children reported by F Helmy and M Al-Malki from Taif, Saudi Arabia were given scorpion antivenom. Repeated doses of antivenom were given when no or inadequate response after giving the antivenom together with other supportive measures . The frequent use of scorpion antivenom might have contributed to the reduction in mortality cases in Saudi Arabia from 3% in 1986 and 1988 to 0.05% in a large epidemiological study in different parts of Saudi Arabia[4,13].

The controversy regarding the efficacy of scorpion antivenom especially in the management of severe envenomation has been discussed in different articles[17,18,34-38]. Recently, in one study of 163 cases from Morocco, no scorpion antivenom was given, however, the mortality rate was 6.74%[16].

New reports showed resolution of the clinical syndrome within 4 hours in critically ill children having neurotoxic effects with treatment by scorpion specific antivenom[21] and better outcome and faster recovery in patients treated with scorpion antivenom over those treated with prazosin alone[18,39]. Furthermore, scorpion specific antivenom was recommended to be the first choice in the management of scorpion stings[40]. In a national study in Saudi Arabia over 12 years for more than 3800 patients, the incidence of severe venom toxicity after antivenom administration was almost negligible[41].

Local signs and pain were reported variably in children. Local pain with or without local signs (redness, swelling, itching, parasthesia) was seen in 61% of patients, being the most common clinical manifestation (Table 1), In Saudi Arabia[19]; F Helmy et al reported nearly similar frequency of 43.75% and 45.5% in children respectively while higher percentage of more than 89% was reported by Izuora et al in south of Saudi Arabia One study in children from Morocco, local pain was present in almost all cases[13,20].

These differences may be due to the difficulty in recognition and assessment of pain in younger children and infants and because of the usual use of analgesics in victims of scorpion stings. Some children were unable to locate the site of pain which may be due to the radiating character of pain due to scorpion sting[39].

Most common systemic manifestation in our study were restlessness and irritability in 31.7% followed by vomiting in 26.8% and cold extremities in 19.5%. A 16 month old child presented with generalized convulsion in emergency room controlled by IV diluted diazepam and was discharged on 3rd day after hospitalization.

Priapism was seen in 13.6% of male children which is lower than that reported by studies in children in Saudi Arabia and Morocco[13,16 ,43]. The severity of clinical manifestation and hence morbidity and mortality following scorpion envenomation depends on age of victim, body weight, scorpion species, season, size of scorpion,dose of venom

injected, time lapsed till seeking medical advice,victim physiological status and quality of medical care provided[18,35 ,39,44-47]. Children are at greater risk of severe illness due cardiac, respiratory,neurologic complications and multiorgan failure.

In Morocco, 90% of fatal cases occurred in those younger than 10 years of age[16,48] and those less than 5 years of age were found to be assosciated with poor prognosis[49]. Furthermore,mortality in children was found to be higher more than 10 times that of adult in a study from Mali[50].

Death rates due to scorpion stings is variable. No death cases reported in Arizona,United states from 1968 till 2010 while 685(8.9%) patients died in Tunis over 13 years period[51]. These differences in death reports could be explained by the above mentioned factors of severity. However these differences might be attributed to different varieties and species of scorpions in different parts of the world as some species are more venomacious than others.

In Saudi Arabia, only one 12 years old child died in a series of 72,168 patients[4] and no deaths were reported in a series of 1449 patients[14]. In our study, one child died (2.4%) which is slightly higher than result of 2 studies in children in Saudi Arabia, 2 children out of 96 and no deaths reported in 64 children in an other study[51]. However, the small sample size may give false percentages.

Generally, it seems that mortality in Saudi Arabia is lesser than some other countries which may be due to the improved medical care in general and the application of a nationalwide protocol for treatment of scorpion sting.

CONCLUSION

Although most of our patients had excellent prognosis,the death of one patient should alert health care workers for the possibility of severe complications following scorpion sting especially in children. Early presentation and aggressive medical interventions may help to prevent death.

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