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ORIGINAL ARTICLE

An Observational Study of Snake Bites versus Scorpion Stings: Cases Admitted to Alexandria Poison Center

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Abstract

Background: A common poisoning in tropical and subtropical areas is snake and scorpion poisoning. A massive scorpion swarm on in southern Egypt left three dead and five hundred hospitalized after heavy storms on 13 November 2021. The morbidity from scorpion sting and snake bite is a medical problem through all seasons of the year. This study was conducted to assess the clinical-epidemiological profile of snake bites and scorpion stings cases admitted to Alexandria poison center, Egypt. In addition, it compared snake bites and scorpion stings' presentation, management, prognosis, and the effect of the polyvalent antivenom, locally produced by (VACSERA).

Subjects and Methods: A prospective observational study was conducted at Alexandria poison center (APC), Alexandria, Egypt. All cases admitted to the hospitals from 1st March 2019 to 29th February 2020 were included.

Results: The study included 130 cases of snake bites (94) and scorpion stings (36). 51.1% of patients with snake bites and 44.4% of patients with scorpion stings were in the age group <30 years. There was seasonal variation of snake bites, and scorpion stings with a reported statistically significant difference (P= 0.008). There was a significant difference between the two study groups regarding the local manifestations. 55.3 % of the cases received supportive measurements and 44.7 % received the polyvalent antivenom. Recovery was the main outcome in 95.4% of patients.

Conclusion: There was a significant difference between the two studied groups regarding the local manifestations. The antivenom was not given to all cases. Recovery was the main outcome in 95.4% of patients.

Keywords: Scorpion, Snake, Poisoning, Antivenom, Alexandria; Egypt

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INTRODUCTION

A common poisoning in tropical and subtropical areas is snake and scorpion poisoning. "A massive scorpion swarm on in southern Egypt left three dead and five hundred hospitalized after heavy storms on 13 November 2021(Associated Press, 2021).The common venomous snakes in Egypt are the cobra (Black Desert, Egyptian, Red Spitting) Field's Horned Viper, Sahara Sand Viper, Indian Saw-scaled Viper, Egyptian Carpet Viper, and Painted Saw-scaled Viper [1].

Snake venoms are complex mixtures consisting of enzymatic components e.g., proteolytic enzymes (serine protease and metalloproteases), non-enzymatic components e.g., cysteine-rich secretory proteins (CRISP), amines, lipids, nucleotides, and carbohydrates. Venoms also contain inorganic cations that are presumed to function as cofactors and include sodium, calcium, potassium, magnesium, and zinc· [2].

In Egypt, there are eight species of scorpion, the first is Scorpio maurus palmatus, which belongs to the family Scorpionedae, and the rest belong to the family Buthidae. Four of them fall into the genus Androctonus, namely Androctonus crassicauda, which is exceedingly rare in Egypt, Androctonus australis, Androctonus bicolor, and Androctonus amoreuxi [3].

The bites and stings usually increase in certain seasons with regional variation. In APC, bites and stings represent 2.1% of admitted cases in 2017 and they represent 1.99% of admitted cases in 2019[4].

A proportion of individuals develop chronic morbidity, disability, and psychological sequelae following snakebite envenomation, including amputations, post-traumatic stress disorder, blindness, maternal and fetal loss, contractures, chronic infections, and malignant ulcers [1].

Bites and stings produce local tissue damage, myonecrosis, and blood vessel integrity is injured causing weakening of the mechanical stability of microvessels. In addition, envenomation produces systemic manifestations e.g., neurotoxicity, acute kidney injury, Rhabdomyolysis, cardiovascular, and homeostatic disturbances [5].

In Egypt, polyvalent antivenom is produced by

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VACSERA, the polyvalent product can neutralize many Egyptian snake venoms, especially Naja haje, Naja nigricolles, Naja pallida, Cerastes cerastes, Cerastes Vipera, Pseudocerastes persicus fieldi, and Walterinnesia a Egyptia. It is produced as a lyophilized powder vial accompanied by a 10 ml diluent vial. The antivenom of scorpion is polyvalent, which can neutralize its effect [6, 7].

A physician in a primary facility can be confronted with a patient suffered from a bite or sting and he/she had to make a decision to give the polyvalent antivenom with its side effects or to transfer the patient to specialized hospitals or centers and decide if the patient's condition allows this.

Aim:

The current study aimed to portray the clinical-epidemiological profile of snake bites and scorpion stings cases admitted to Alexandria poison center, Alexandria, Egypt. Moreover, it delved into the possible relationships between these characteristics, the necessity of administrating polyvalent antivenom, and sought to establish a clinical guide for the management of the snake bites and scorpion stings cases with preservation of resources**.**

METHODS

A prospective observational study was conducted at Alexandria poison center (APC), Alexandria, Egypt.

Subjects

The target population for the current study was:

All patients with snake bites and scorpion stings envenomation admitted to Alexandria Poison Center of Alexandria Main University Hospital for twelve months starting from 1st March 2019 to 28th February 2020. The following data were collected:

- Demographic data of cases with snake bites and scorpion stings envenomation.(Residence, age, sex season, time of admission, time of consultation)
- Pattern of snake bites and scorpion stings envenomation. (Pre-hospital management, site of bite or sting)
- Incidence of snake bites and scorpion stings envenomation.
- Patient's assessment: local manifestations, vital signs, clinical examination, Glasgow coma scale (GCS), pupil size,
- Routine investigation; CBC, kidney function, liver function, cardiac enzyme, ECG, ABG, coagulation profile ad electrolytes
- The outcome.

Inclusion Criteria:

All Patients with snake bites and scorpion stings admitted to the APC after taking informed consent.

The antidote was given according to the clinical-laboratory severity grading scale used in the study [8].

Grade 0: no envenomation

Grade 1: minimal envenomation (local swelling and pain without progression)

Grade 2: moderate envenomation (swelling, pain, or ecchymosis progressing beyond the site of injury, mild systemic, or laboratory manifestations)

Grade 3: severe envenomation (marked local response, severe systemic findings, and significant alteration in laboratory findings).

All patients received supportive measurements after reassurance e.g., fluids, oxygen, analgesics…etc.

Statistical Analysis

Data were collected using a pretested sheet including presentations, management, prognosis, and the effect of the polyvalent antivenom, on the patient. All data were analyzed using Statistical Package for Social Sciences (SPSS version 11.5).

Ethics Approval and Consent to Participate

The Ethical committee of Faculty of Medicine, Alexandria University approved the study (IRB00007555, FWA 00018699), and consent was taken from the participants or their relatives before collecting data after a full explanation for the purpose and aims of the study.

Personal data was considered confidential.

Informed consent was obtained from all subjects and/or their legal guardian(s).

Adherence to National and International Regulations:

The Ethics Committee is constituted and operated according to ICH GCP Guidelines as applicable to local and institutional regulations and guidelines that govern ethics committees' operation.

RESULTS

The present study was conducted on 130 patients with snake bites and scorpion stings envenomation admitted to Alexandria Poison Center of Alexandria Main University Hospital for twelve months starting from 1st March 2019 to 29th February 2020.

Males represented (90.8%) of the sample and female to male ratio was 1:10. The age of studied patients ranged from 5 to 60 years with a mean value of 31.4 ± 12.3 years. 51.1% of patients with snake bites were in the age group <30. Similarly, 44.4% of patients with scorpion stings were in the same age group. Therefore, there was no significant statistical difference between the two study groups.

More than half of the patients were from Beheira (50.8%), followed by 20.0% from Alexandria, then 15.4% from Matrouh, and 13.8% from Kafr El-Sheikh. Most of the patients with snake bites admitted to APC were from Beheira (58.5%) and a significant difference was recorded between the two study groups regarding residence (P=.001).

Regarding admission to APC, most patients with snake bites were males (91.5%). In addition, 88.9% of the patients with scorpion stings were males. However, no statistically significant difference was observed between the two studied groups regarding sex (P= 0 .647). Considering the seasonal incidence of snake bites, the highest was in autumn (36.2%), followed by summer 35.4%, while the highest incidence of scorpion stings was observed in summer (39.4%) followed by autumn 31.9% with a reported statistically significant difference (P= 0.008). A total of 39.4% of patients with

snake bites were admitted to APC in the morning. On the other hand, more than half of the cases with scorpion stings (55.5%) were admitted to APC in the afternoon. Besides, 54.3% of patients with snake bites sought medical consultation within 2-6 hours. Correspondingly, 52.8% of patients with scorpion stings asked for medical consultation within 2-6 hours. Hence, no statistically significant difference was observed between the two study groups. (Table 1)

Accidental poisoning was the pattern of exposure in all patients (100%). About 23.4% of patients with snake bites and 25 % of patients with scorpion stings received Pre-hospital management. The right upper limb was the main site of snake bites (26.6%) while 36.1% of patients with scorpion stings were stung in the left lower limb. Therefore, a significant difference was observed between the two studied groups. (Table 2)

There was a significant difference between the two studied groups regarding the local manifestations where edema and fang marks were recorded among 44.7% and 30.9%, respectively. On the other hand, pain and paresthesia were the complaints of all patients with snakebite versus 91.7% of patients with scorpion stings, respectively. (Table 3)

The patients of both groups had been classified as mild, moderate, and severe according to the clinical manifestations.

Table 4 illustrates vital signs and lab findings among cases according to animal envenomation.

Antidote locally produced by (VACSERA) was given to 44.6% of patients and the number of vials was significantly different in the two studied groups. Similarly, supportive treatment was significantly different in the two studied groups. (Table 5)

Table 1. Distribution of patients' bio-demographic data by Animal envenomation

Bio-demographic data	Total		Animal envenomation				P-value
			Snake		Scorpion		
	No	%	No	%	No	%	
Governorate							
Alexandria	26	20.0%	8	8.5%	18	50.0%	.001*
Behera	66	50.8%	55	58.5%	11	30.6%	
Kafr El-Sheikh	18	13.8%	15	16.0%	3	8.3%	
Matruh	20	15.4%	16	17.0%	4	11.1%	
Age in years							
<30	64	49.2%	48	51.1%	16	44.4%	.593
30-39	35	26.9%	23	24.5%	12	33.3%	
40+	31	23.8%	23	24.5%	8	22.2%	
Sex							
Male	118	90.8%	86	91.5%	32	88.9%	.647
Female	12	9.2%	8	8.5%	4	11.1%	
Season							
Winter	14	10.8%	10	10.6%	4	11.1%	.356
Spring	23	17.7%	17	18.1%	6	16.7%	
Summer	46	35.4%	37	39.4%	9	25.0%	
Autumn	47	36.2%	30	31.9%	17	47.2%	
Time of admission							
Morning	45	34.6%	37	39.4%	8	22.2%	.008*
Afternoon	45	34.6%	25	26.6%	20	55.6%	
Night	40	30.8%	32	34.0%	8	22.2%	
Time of consultation							
< 2	29	22.3%	17	18.1%	12	33.3%	.091
2-6	70	53.8%	51	54.3%	19	52.8%	
> 6	31	23.8%	26	27.7%	5	13.9%	

P: Pearson X2 test
* P < 0.05 (significant)

Table 2. Distribution of poisoning pattern and bite data by Animal envenomation

Poisoning data	Total		Animal envenomation				P-value
			Snake		Scorpion		
	No	%	No	%	No	%	
Pattern of poisoning							-
Accidental	130	100.0%	94	100.0%	36	100.0%	
Pre-hospital management							
Yes	31	23.8%	22	23.4%	9	25.0%	.848
No	99	76.2%	72	76.6%	27	75.0%	
Site of bite							.014*^
Right upper limb	29	22.3%	25	26.6%	4	11.1%	
Left upper limb	27	20.8%	20	21.3%	7	19.4%	
Right lower limb	29	22.3%	22	23.4%	7	19.4%	
Left lower limb	38	29.2%	25	26.6%	13	36.1%	
Trunk	4	3.1%	0	0.0%	4	11.1%	
Head/Neck	3	2.3%	2	2.1%	1	2.8%	

P: Pearson X^2 test
^ Exact probability test
** P < 0.05 (significant)*

Table 3. Patient's assessment data by Animal envenomation

Assessment	Total		Animal envenomation				P-value
			Snake		Scorpion		
	No	%	No	%	No	%	
Local examination							.001*
Oedema	44	33.8%	42	44.7%	2	5.6%	
Fang marks	29	22.3%	29	30.9%	0	0.0%	
Felt distal pulsation	129	99.2%	94	100.0%	35	97.2%	
Haemorrhagic bullae	4	3.1%	4	4.3%	0	0.0%	
Numbness	5	3.8%	5	5.3%	0	0.0%	
Pain	36	27.7%	0	0.0%	36	100.0%	
Ecchymosis	6	4.6%	6	6.4%	0	0.0%	
Paraesthesia	33	25.4%	0	0.0%	33	91.7%	
Erythema	9	6.9%	0	0.0%	9	25.0%	
GCS							.534
13	1	.8%	1	1.1%	0	0.0%	
15	129	99.2%	93	98.9%	36	100.0%	
Pupil Size							-
Normal	130	100.0%	94	100.0%	36	100.0%	
ECG							.118
Normal sinus rhythm	123	94.6%	91	96.8%	32	88.9%	
Sinus tachycardia	6	4.6%	3	3.2%	3	8.3%	
Sinus bradycardia	1	.8%	0	0.0%	1	2.8%	

^ Exact probability test
** P < 0.05 (significant)*

Table 4. Vital signs and lab findings among cases according to Animal envenomation

Lab	Parameters	Total				Animal envenomation							
						Snake				Scorpion			
		Min	Max	X	SD	Min	Max	X	SD	Min	Max	X	SD
Vital signs	HR	50.0	150.0	92.7	14.6	60.0	150.0	93.1	13.4	50.0	140.0	91.4	17.4
	RR	12.0	26.0	16.5	3.2	12.0	26.0	16.7	2.6	12.0	26.0	15.9	4.4
	Temperature	37.0	38.5	37.2	0.3	37.0	38.5	37.2	0.2	37.0	38.0	37.2	0.3
ABG	PH	7.3	7.6	7.4	0.1	7.3	7.6	7.4	0.0	7.3	7.5	7.4	0.1
	PCO2	19.0	62.0	38.7	6.8	19.0	56.0	38.8	6.0	19.0	62.0	38.3	8.5
	HCO3	13.3	29.8	22.3	2.5	13.3	25.7	22.3	2.1	14.5	29.8	22.5	3.4
	SaO2	29.0	99.0	93.3	15.8	59.0	99.0	96.1	7.2	29.0	99.0	86.0	26.6
CBC	Hb	6.5	16.3	13.3	1.7	6.5	16.3	13.1	1.9	11.0	15.7	13.9	1.1
	WBCs	4.0	22.7	9.4	2.9	4.0	22.7	9.6	3.1	5.0	13.6	8.7	2.3
	PLTs	48.3	400.0	294.5	88.6	48.3	395.0	289.3	91.8	154.0	400.0	307.9	79.0
Liver function	AST	7.0	64.0	24.8	8.2	7.0	64.0	26.1	8.6	16.0	35.0	21.4	5.7
	ALT	8.0	213.0	25.8	18.4	8.0	213.0	25.6	20.9	15.0	42.0	26.5	9.5
Renal	Urea	15.0	122.0	27.8	15.5	15.0	122.0	28.2	15.8	15.0	98.0	26.7	14.9
	Creatinine	0.2	6.2	0.8	0.5	0.2	6.2	0.8	0.6	0.6	1.4	0.8	0.2
	BUN	7.0	57.0	13.8	6.2	7.2	57.0	14.1	6.3	7.0	38.0	12.8	5.8
Electrolytes	Na	124.0	142.0	137.4	2.2	124.0	142.0	137.1	2.4	136.0	140.0	138.0	1.5
	K	3.5	5.0	4.2	0.4	3.5	5.0	4.1	0.4	3.5	4.6	4.2	0.3
Co-angulation	PT	11.3	60.0	18.9	15.7	11.7	60.0	20.8	17.5	11.3	60.0	14.1	8.4
	PTT	1.9	60.0	32.2	10.2	1.9	60.0	32.9	11.1	22.0	60.0	30.3	7.0
	INR	0.9	10.5	1.2	0.9	0.9	10.5	1.3	1.0	0.9	1.8	1.1	0.3
Cardiac enzymes	CK-MB	0.0	59.6	1.3	6.4	0.0	59.6	1.6	7.5	0.0	4.9	0.6	1.3
	CK-Total	2.1	530.0	70.8	87.1	2.1	213.0	61.8	52.9	12.0	530.0	94.2	140.4
	Troponin	0.0	1.0	0.0	0.1	0.0	1.0	0.0	0.1	0.0	0.0	0.0	0.0

Table 5. Management received among cases according to Animal envenomation.

Management	Total		Animal envenomation				P-value
			Snake		Scorpion		
	No	%	No	%	No	%	
A. Antidote							
Yes	58	44.6%	42	44.7%	16	44.4%	.981
No	72	55.4%	52	55.3%	20	55.6%	
No. of vials							
Range	3-60		10-60		3-15		.001*$
Mean ± SD	16.4 ± 11.7		19.9 ± 11.9		7.1 ± 3.1		
Median	11.0		16.0		6.0		

Table 5. Continued.

Management	Total		Animal envenomation				P-value
			Snake		Scorpion		
	No	%	No	%	No	%	
Supportive treatment							
IV fluids	130	100.0%	94	100.0%	36	100.0%	
Analgesics	130	100.0%	94	100.0%	36	100.0%	
Anti-Oedematous	37	28.5%	35	37.2%	2	5.6%	
Vitamin B12	129	99.2%	93	98.9%	36	100.0%	.008*^
Vitamin K	14	10.8%	14	14.9%	0	0.0%	
FFP	1	.8%	1	1.1%	0	0.0%	
Blood transfusion	1	.8%	1	1.1%	0	0.0%	
Mechanical ventilation	2	1.5%	2	2.1%	0	0.0%	

P: Pearson X^2 test *$: Mann-Whitney test*
^ Exact probability test
** P < 0.05 (significant)*

The hospital stay of the patients ranged from 24 to 47 hours for the two groups (60.6%, 63.9% respectively). Recovery was the main outcome in 95.4% of patients, while complication was encountered in 2.3 %., ICU admission in 1.5% ad discharge against medical advice was met in 0.8%. In sum, there was a significant difference between the two studied groups regarding the duration of hospital stay. Complete recovery was the fate of most patients in this case study. (Table 6)

DISCUSSION

Snakebite envenomation is an important medical problem in hot climate countries e.g., Africa, Asia, Papua New Guinea, and Latin America. Snakebite envenomation occurs

Table 6. Patients fate according to Animal envenomation.

Fate	Total		Animal envenomation				P-value
			Snake		Scorpion		
	No	%	No	%	No	%	
Duration of hospital stay (hours)							
< 6 hrs.	4	3.1%	0	0.0%	4	11.1%	
6-23 hrs.	4	3.1%	2	2.1%	2	5.6%	.004*
24-47 hrs.	80	61.5%	57	60.6%	23	63.9%	
48-71 hrs.	33	25.4%	26	27.7%	7	19.4%	
>72 hrs.	9	6.9%	9	9.6%	0	0.0%	
Outcome							
Recovered	124	95.4%	89	94.7%	35	97.2%	
Complication	3	2.3%	3	3.2%	0	0.0%	.208
ICU admission	2	1.5%	2	2.1%	0	0.0%	
Discharge against medical advice	1	.8%	0	0.0%	1	2.8%	
Complications							
Nephrotoxicity	0	0.0%	0	0.0%	0	0.0%	
Neurotoxicity	1	.8%	1	1.1%	0	0.0%	.812
Compartment syndrome	1	.8%	1	1.1%	0	0.0%	
Leg ulcer	1	.8%	1	1.1%	0	0.0%	

P: Exact probability test
** P < 0.05 (significant)*

in 2.7 million individuals each year, with mortality going from 81 000 and 138 000 deaths. Of the survivors, up to 400 000 are left with a permanent disability [9]. On the other hand, the incidence rate of scorpion stings was 334.37/100,000 inhabitants in 2008 and 339.07/100000 in 2009 [10].

In the present study, males exposed to bites and stings represented (90.8%) and their age had a mean value of 31.4 ± 12.3 years for both groups. This agrees with several researches where they declared that bites and stings are most common in young males and between agricultural workers, who comprise the most productive members of rural communities [5, 10, 11].

Most patients were on average age of 30.4 years, which is suitable with the age of work as males were exposed to the field and outdoor missions more commonly. Most cases of snakebites, occurred in autumn (36.2%), followed by summer 35.4%, while the highest incidence of scorpion stings was observed in summer (39.4%) followed by autumn 31.9% with a reported statistically significant difference (P= 0.008). Worldwide, snakebites are most common in the summer and scorpion season is autumn when people are outdoors. Still, some studies declared that autumn is the main season for snake bites. This may be due to the high temperature in Egypt and those countries in autumn and summer [10-14].

Geographically, for snake bites, both Beheira and Kafr El-Sheikh (rural areas) represented the highest incidence of bites. Rural areas reported more snakebites than elsewhere due to more intensive agricultural activities. This is consistent with previous reports by Chafiq et al 2016 and El Hattimy et al 2018 [14,15]. While in scorpion stings, Alexandria represented the highest incidence of stings. It is a harbor and travelers join or leave each day, this is besides that APC is the nearest to all four governorates, that provide medical services 24/7 and considered a tertiary facility. This is verified by Cheng 2021 [16] who stated that scorpion is common in underdeveloped tropical and subtropical countries, especially Sahelian Africa, South India, the Middle East, Mexico, and South Latin America. However, these scorpions may be found anywhere as it is transported with luggage and cargo.

In the present research, 54.3% of patients with snake bites sought medical consultation within 2-6 hours and 52.8% of patients with scorpion stings asked for medical consultation within the same time. This is variable according to the availability of medical services nearby. Chatterjee et al 2020 [17] stated that the median time between event and arrival at primary care center was 1 hour, while the median time to arrive at the hospital was 11 hours.

Unlike the myth of Cleopatra, accidental poisoning is the main pattern in the present study. This finding is in agreement with Gutiérrez 2017 [5] and Cheng 2021 [16] for snake and scorpion poisoning, respectively.

The upper limb was the main site of snake bites while in scorpion stings the left lower limb was the most common site in the present study. So, a significant difference was observed between the two studied groups. There is much variability in different research studies in this area, some mention that scorpion stings usually occur on the hands, arms, feet, and legs [18].

Rahman et al, 2010 [19] stated that most of the victims received snake bites injured in the lower extremities. Mitra, et al [20] showed that the most common site of bites is feet (48%), hands (24%) and legs (21%). This difference may be due to the method of working. If it is a manual handling of objects or tools, the bites will be on the hands. Likewise, if the work is mechanical, the lesion will be in the lower extremities.

There was a significant difference between the two study groups regarding the local manifestations where edema and fang marks were recorded among 44.7% and 30.9% of patients with snakebite, respectively. On the other hand, pain and paraesthesia were the complaints of 100% and 91.7% of patients with scorpion stings, respectively.

The signs are localized and coincide with the well-known signs in bites and stings as follow:

1-***Local findings:*** Puncture marks at the wound, redness, swelling, bruising, bleeding, or blistering around the bite, severe pain, and tenderness [21].

2-***General findings:*** Nausea, vomiting, or diarrhea, difficult breathing, tachycardia, weak pulse, low blood pressure, disturbed vision, metallic taste in the mouth, increased salivation and sweating, numbness or tingling around the face and/or limbs, muscle twitching [21]systemic neurotoxicity is common in Copra bite and represented as descending paralysis, ptosis, and respiratory failure. It can sometimes cause recurrent systemic envenomation in patients, who sustained viper bites, and who previously responded to antivenom and this required intratracheal intubation, ventilatory support, and early antidote treatment [22]. In some instances, coagulopathy was another complication attributed to Viperidae species, but to a lesser extent. It often causes venom-induced debilitating coagulopathy (VICC), which can be complicated by life-threatening bleeding. VICC has a complex pathophysiology that affects several steps in the coagulation pathway. Early detection of VICCs is difficult because traditional blood tests such as prothrombin time (PT) and activated partial thromboplastin time (APTT) are unreliable for early monitoring of VICC progression [23].

3-***In scorpion:*** At the site of the sting, there may be intense pain, tingling, and numbness around the sting, and swelling around the sting. Generally, breathing difficulties, muscle thrashing or twitching, unusual movements of the neck, head, and eyes, dribbling or drooling, sweating, nausea, vomiting, high blood pressure, tachyarrhythmia, restlessness, excitability, or inconsolable crying [18].

A grading system can be used to classify the injury and determine appropriate management. Supportive treatment and antidote locally produced by (VACSERA) was given only to 44.6% of patients and the number of vials was significantly different in the two studied groups. This can be explained either by absent clinical manifestations, or it was dry bite. Bites by nonvenomous snakes are common and bites by venomous species are not always accompanied by the injection of venom (dry bites). No systemic symptoms are characteristics of nonvenomous species. Most patients had

anxiety symptoms even if they are not bitten by venomous species. Most people believe that any bite from any snake will result in envenomation. However, 64.4% of all snakebites in this study did not result in envenomation. Patients, who had moderate or severe systematic symptoms (Grade III and IV) or any degree of envenomation with the progression of the envenomation syndrome were eligible for therapy with antivenom. Venomous snakebite diagnosis based on clinical effects of envenoming and laboratory findings was a useful diagnostic test to confirm which of the major snake groups are responsible for the envenoming and determine the appropriate antivenom to be administered [6].

The hospital stay ranged from 24-47 hours for the two groups (60.6%, 63.9% respectively). Recovery was the main outcome in 95.4% of patients, complications were encountered in 2.3 %. ICU admission was in 1.5%, while discharge against medical advice was met in 0.8%.

Gouda et al 2017 [6] mention that the average duration of hospital stay of nonvenomous snakebites is 0.53 days and venomous snakebites are 2 days. Severity grade was found to be in direct proportional relation with the duration of hospital stay, as symptomatic cases needed prolonged follow-up after resolution of symptoms fearing the risk of recurrence. According to MOH protocol, the patient is to be discharged after 6 hours of observation if there are no local or systemic symptoms plus normal laboratory tests. The patient was discharged after 24- 48 hours for fear of complication, especially in patients with initial coagulopathy [7]. Most of the patients in this study are in this category.

Antivenom doses were repeated based on the clinical observation to neutralize the venom and cease symptoms. Most of the patients, who received antivenom responded to a single dosage during hospitalization. In two cases (one case with paralysis and the other with coagulopathy), a third dose was needed as they did not show any improvement after the first and second doses.

Recovery was the main outcome in 95.4% of patients, the complications were encountered in 2.3 %, ICU admission in 1.5% ad discharge against medical advice was met in 0.8%. There was a significant difference between the two studied groups regarding the duration of hospital stay. Complete recovery was the fate of most patients. No mortalities were recorded in the studied cases as in other studies with a similar sample size [6].

Preventive measures should be followed to decrease exposure to animal poisoning. Medical service improvement as well as antivenom availability play significant roles in improving the outcome of such cases [24].

CONCLUSION

Early transport, proper management, correction of hemostatic disorders, and antivenom will yield a good outcome. It should be noted that not all cases will need the antivenom. As a physician is a primary facility according to the clinical findings, poisoned patients can either receive the polyvalent antivenom or be transferred to specialized hospitals or centers according to time of exposure, site of the bite, clinical picture etc.

LIMITATION

Some cases may be missed due to failure in referral system.

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