



## Severity of Scorpion Sting Manifestations

Authors

**Dr.Veerabhadraiah.K<sup>1</sup>, Dr.V.Sreenivasulu<sup>2</sup>**

<sup>1</sup>M.D. Associate Professor, Government Medical College, Anantapuramu

<sup>2</sup>M.D, Associate Professor, Govt Medical College, Anantapuramu

### ABSTRACT

*Scorpion envenomation is an important public health hazards in tropical and subtropical regions. Envenomation by scorpions can result in a wide range of clinical effects, including cardiotoxicity, neurotoxicity and respiratory dysfunction. Eventhough recent advances in Medical therapy, the mortality remains high in rural areas due to lack of access to medical facilities.*

*Scorpion sting are a common emergency in India and many other tropical countries. In India the red scorpions are more prevalent and their venom is more likely to cause Myocardial dysfunction.*

*A descriptive study was conducted on severity of scorpion sting manifestations among 100 admitted cases in Government General Hospital, Anantapuramu from January 2014 to December 2014. All the subjects 100(100 percent) have pain at the site of scorpion bite. Majority of the subjects 85(85 percent) experienced tachy cardia, most of the subjects had peripheral circulatory failure and pulmonary edema which needs immediate identification and therapy. Delays in treatment may leads to higher morbidity and mortality. The present study describes severity of Scorpion sting manifestations and envenomation complications in our emergency ward and ICU, Government General Hospital, Anantapuramu.*

**Key Words:** *Scorpion sting, Envenomation, Pulmonary edema, Mesobuthustamulus*

### Introduction

Scorpion envenomation is an occupational hazard for farmers, farm labors, villagers migrating population and hunters. Scorpion are generally found in dry, hot environments although some species also occur in forest and west savannas .All species are nocturnal, hiding during the day under stones, wood or tree barks. The risk of scorpion sting is higher in rural areas, but some species are

found close contact with man and live around us inside human dwelling <sup>21</sup>.

Worldwide 3,000 deaths are estimated per year due to the scorpion bite. The red Scorpion (Mesobuthustamulus) is the world's deadliest scorpion. Because of its fatality W.H.O considered as scorpion envenomation as second most important type of poisoning caused by animals around the world. The annual number of

scorpion sting cases exceeds 123 million of which over 32250 may be fatal<sup>20</sup>. The real incidence, morbidity and deaths are scarce, because most of victims do not see medical treatment or public health structure and prefer to consult traditional healers moreover scorpion sting is not included in a list of notifiable diseases, the actual burden of scorpion stings is likely to be underestimated. Seven regions where scorpion sting poses significant public health concern are north-shara Africa, Near and middle east, South India, México and south Latin America.

A retrospective analysis of the calls received by the national poisoning information centre (NPIC) between 1999 and March 2002 showed that, out of 995 calls six involved scorpion sting. During hot months March to June and September to October daily cases of scorpion sting are received at endemic areas western Maharashtra, Karnataka, Andhra Pradesh and Tamilnadu. 11 to 15 severe scorpion stings due to *Mesobuthus tamulus* species of scorpion per month reported from Kokhan region. Higher incidence of scorpion sting occurred in hot months attributed to increase in agricultural activities.

Cardio vascular complications are the most important manifestations of Indian red scorpion envenomation. A full spectrum from hypotension and peripheral circled to hypertension leading to stroke has been observed.

The clinical effects of envenomation depends up on the species of scorpion and lethality, dose of venom injected at the time of sting. Severe effects is seen in first victim than envenom by same scorpion to subsequent victim. Severity of

envenom is related to age, size of scorpion and season of the sting, time lapsed between sting and hospitalization. Severity of scorpion sting occurs in children with 3.9 to 10 percentage fatality irrespective of intensive care management from Israel, Turkey and India. Clinically autonomic storm evoked due to venomous envenoming is characterized by transient parasympathetic (vomiting, profuse sweating, droopy salivation bradycardia ventricular premature contraction priapism in male, hypertension) and prolonged sympathetic stimulation (cold extremities, hypertension tachycardia, pulmonary edema and shock)<sup>19</sup>.

#### **Design and methods collection of Data**

A Prospective study has taken 100 scorpion sting cases admitted in emergency ward and medical ICU in Govt. General Hospital, Anantapur. The duration of study was 12 months.

The subjects included in the present study have a definite scorpion sting where the scorpion is immediately collected and witnessed.

All the subjects had undergone clinical history and through clinical examination Demographic features are age, sex, area of living, type of soil, Duration of hospital arrival, the scorpion sting manifestations are pain at the site, paresthesia, sweating, excessive salivation & Hypotension, priapism are identified and all necessary investigations along with electrocardiograph was done.

Each subject was thoroughly examined for 4 hours and hourly monitoring of heart rate, respiratory rate, blood pressure, cardio vascular and

respiratory status to study systemic envenomation and development of complications.

### Results

The results of the study were out of 100 subjects male (-60, Female -40) 100% causes have pain at site followed by sweating (69%) other features are paresthesia (79%) Tachycardia, cold peripheries, increased blood pressure observed in (85%, 32%) and (23%) of cases respectively. While blurring of vision and altered sensorium (7%) were high in males out of which 6% subjects developed encephalopathy. Peripheral circulatory failure was observed in 52% of the patient due to fluid loss & myocarditis. 23% subjects had high BP and 13% hypotension commonest complications were hypertension which was observed in 29% of the subject's myocarditis and congestive cardiac failure were present in 16% of subjects. 5 subjects who had encephalopathy had very high blood pressure and pulmonary edema. 1 subject died due to pulmonary edema, severe hypotension was treated with all medical measures and secured to death. Majority of the patients 97% recovered completely after regular follow up for 6 months.

### Discussion

Scorpion sting envenomation may leads to severe manifestations and rarely it needs immediate medical care. It is a second commonest poisonous sting bites in rural and urban slum areas. In case of minor sting people may not visit the medical care so many cases are not notified and exact incidence unknown. In the present study profuse sweating which was present in 69 subjects (69

percent), which was compared to previous studies (8,11,14). Other common symptoms was paraesthesia observed in 79 subjects (79 percent). It was present up to 48 hours, but on indication of severity of disease.

Other manifestations are palpitations cough were present in 36, 39 (36 percent, 39 percent) subjects which was comparable to other reports (8, 11). 28 (28percent) subjects had dyspnoea out of 100 subjects. 25 (25 percent) had pulmonary edema. 7 (7percent) subjects had altered sensorium. out of which 3 developed severe pulmonary edema and 2 subjects developed encephalopathy. Majority of the subjects 85(85percent) experienced palpitations, excessive salivation in 7(7percent) subjects nausea/vomiting noted in 13 (13 percent) subjects. Venom acts via cholinergic and adrenergic stimulation. The cholinergic activity is either due to reduced destruction of acetylcholine (Ach) or excessive Ach release acting on post ganglionic nerve endings. Serotonin and nor adrenaline are also released by scorpion secretion by beta adrenergic stimulation increases blood pressure, tachycardia was the commonest manifestations present in 85 (85 percent) subjects. This result was similar with the other studies (8, 12). hypertension was noted in 23 (23percent) subjects. In other Indian studies, the manifestations of hypertension due to sympathetic hyperactivity varied from 12-29 percent (5, 8, 10, and 14). The average time for normotensive range was 8hours.

**Table-1** symptoms of Scorpion Sting

S.no	Symptoms	Male (N=60)		Female (N=40)		Total	
		No	%	No	%	No	%
1.	Pain at site	60	100	40	100	100	100
2.	Paresthesia	44	73	35	87	79	79
3.	Swelling at site	nil	-	5	12	5	5
4.	Profuse sweating	41	68	28	70	69	69
5.	Excessive Salivation	2	3	5	12	7	7
6.	Nausea/Vomiting	5	8	8	20	13	13
7.	Cough	22	36	17	42	39	39
8.	Dyspnea	15	25	13	32	28	28
9.	Palpitation	20	33	16	40	36	36
10.	Blurring of vision	3	5	5	12	8	8
11.	Altered Sensorium	4	6	3	7	7	7
12.	Tachycardia	51	85	34	85	85	85
13.	Tachypnea	12	20	08	20	20	20
14.	Hypertension	14	23	09	22	23	23
15.	Hypotension	10	16	3	7	13	13
16.	Cold Periphery	20	33	12	30	30	32
17.	Ronchi	08	13	04	10	12	12
18.	Abdominal Tenderness	01	01	02	05	03	03
19.	Encephalopathy	04	06	02	05	06	06

Hypotension commonly may occur within 1-2 hours due to profuse sweating and with I 4-8 hours due to left ventricular dysfunction. Hypotension was noted in 13 subjects, this incidence was lower compared to other studies. This may be because of hypotension is more common in children, who formed majority of the subjects found in these studies. (5,14). 7 of the hypotensive subjects developed pulmonary edema. While 2 others succumbed to envenomation.

Cold periphery present in 32 (32percent) subjects peripheral circulatory failure 52 (52 percent) of the subjects while the other 48 (48percent) of the subjects showed manifestations of pulmonary edema, hypertension, cardiac failure. These complications were also seen in other studies (10,

16) with their incidences ranging from 56 percent to 80 percent in India (5,10,12). These complications may be relation with the effect of autonomic storm.

One subject had refractory pulmonary edema and hypotension. Subject succumbed to these complications even after treated with all medical measures and secured to death. Myocarditis is another cardiovascular complications scorpion sting, commonly occurs due to *Mesobuthus Tumulus* species envenomation (15, 17, 18).The usual incidence of this complication is between 20 to 50 percent.

In this study 16 (16percent) subjects had myocarditis with most of them developing in to peripheral circulatory failure and pulmonary edema.

**Table: 2** Complications of scorpion sting

s.no	Complications	Male N=60		Female N=40		Total	
		No	%	No	%	No	%
1.	Peripheral circulatory Failure	25	58	17	42	52	52
2.	Congestive Cardiac failure	10	16	06	15	16	16
3.	Myocarditis	10	16	06	15	16	16
4.	Pulmonary edema	14	23	11	27	25	25
5.	Hypertension	20	33	09	22	29	29
6.	Encephalopathy	03	05	02	05	05	05
7.	Death	01	01	-	-	01	01

**Conclusion**

Scorpion sting is sometimes life threatening in Pamidi and Athamakur mandal because of Indian Red Scorpion (*Mesobuthus Tumulus*) is usually seen in this mandals. In this study majority of the cases had peripheral circulatory failure and pulmonary edema which needs immediate identification and the management. Delays in treatment may leads to higher morbidity and mortality.

**References**

1. B.Vazirianzadeh,F. FARHADPOUR,(2012),Scorpionism in Hospitalised children:J Arthropod Borne Disease 2012;6(1):62-9 Epub 2012 Jun 30.
2. Suresh V Sagarad,Balaram Singh 2013 Myocarditis after a scorpion sting Envenomation.J.Clin Diagn res 2013 Jan; 7(12)2836-8.
3. Carlos HENRIQUE Mirianda,Karina Tozatto maio 2014 ventricular tachycardia and cardiogenic shock due to scorpion envenomation case Rep med 2014:
4. Bawaskar Hs and Bawaskar PH 2012. "Scorpion sting:update." J Assoc physicians India 60: 46-55.
5. Mahadevan S. scorpion sting. Ind. Ped.May 2000; 37: 504-514.
6. Clark R.F; scorpion envenomation. In: Clinical Toxicology Ford MD, DELANEY ST Ka, LJ, Erickson j, edt, 1 edn, WB.Saunders company; Pennsylvania: 2004, P-290-293
7. Bawaskar. HS, Bawaskar PH1988, symptoms, signs & management of Indian Red Scorpion envenomation, Medicine update; APICON, API, India; 475-476.
8. Gueron.M, Yaron.R, 1970, cardiovascular manifestations of severe scorpion sting. Chest, 57: 156-162
9. Reddy, B.Ramachandra, "Scorpion envenomation" what is New? "Medicine update-contents 13. Chapter 93, 421-423.
10. Bawaskar. HS, Bawaskar PH1988, symptoms, signs and management of Indian Red Scorpion envenomation, Indian J pediatrics; 65: 383-391.

11. Ganeshan TK, Venkataraman S, 1989, Generalized tonic-clonic fits following scorpion sting, *Neurol India* 37 (2) 9.
12. Sofer s, Gueron M, 1990, Vasodilator and hypertensive encephalopathy following scorpion envenomation in children. *Chest*; 97; 118-120.
13. WAHD, Simard JM; 1984; Neurotoxic proteins in scorpion venom, *J Toxicol Toxin Reviewers*; 3: 181-221.
14. Chellaiah.T; Rajendran.M, Daniel MK, Sahayam JIJ; 1993, stroke following scorpion sting. *J ASSOC Physicians India*; 41 (5): 310
15. Miller RR. Awan NA, Maxwell KS, Mason DT. 1977; Sustained reduction of cardiac impedance and preload in congestive heart failure with anti-hypertensive vasodilator Prazosin, *N Eng, J Med*; 297 (6): 303-307
16. Chada JS. Leviav a. 1979; Hemodialysis, Renal failure and local necrosis following scorpion sting *JM Med Assoc*; 241 (10); 1038.
17. Mahadevan S, Choudhary P, Puri RF, Srinivasan S, 1981, scorpion envenomation and the role of lytic cocktail in its management. *Indian J pediatrics*; 48: 757-761.
18. Rajarajeswari G, Sivaprakasam S, Viswanathan J; 1979; Morbidity and mortality pattern in scorpion stings *J. Indian Med Assoc*; 73 (788):123-126.