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**RESEARCH ARTICLE**

# CLINICAL PROFILE OF SCORPION STINGS

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**ABSTRACT**

**Aims of the study:** To study clinical presentation, complications and response to supportive management of cases of scorpion sting.
**Methods and Material:** Thirty cases of acute scorpion bite were studied in detail and compared with previous data from literature.
**Results**: All the thirty cases were brought to our hospital, among them twenty one cases were males and remaining nine cases were females, with their age ranging from 14 years to 62 years. Sixteen cases were farmers, six were housewives, five were students, two were truck drivers and one was manual labourer. Local pain was prominent symptoms, next were warm extremities, breathlessness, sweating, palpitation and vomiting, eighteen cases had tachycardia, hypertension and hyperthermia. Two cases had mydriasis, pulmonary oedema, ST segment changes and reduced left ventricular ejection fraction. None of the patient was treated with mechanical ventilation. All the cases responded to supportive treatment and recovered completely.
**Conclusion**: Scorpion stings are more common in males. Maximum patients are in age group of fourth decade. Incidence is high in farmers. Maximum number of cases had scorpion sting on lower limb. Stings are more at the day time. Local pain, breathlessness, sweating and redness of local area are the commonest symptom. Tachycardia hypertension and hyperthermia are common signs. Mydriasis is rare. Electrocardiogram were normal except few had ST segment depression and ventricular premature beats. Myocarditis and pulmonary oedema are rare complications which are treatable.



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## INTRODUCTION

Scorpion stings are a major public health problem in many tropical countries. Out of 1500 scorpion species, 50 are dangerous to humans. Scorpion stings cause a wide range of manifestations, from several local skin reactions to neurologic, respiratory, and cardiovascular collapse. Scorpion venom contains neurotoxin, haemolysins, agglutinins, haemorragins, leucocytolysins, coagulins, ferments, lecithin and chlolesterin (Ahmad, 2015). This is one of the study which deals with epidemiological and clinical aspect of scorpion stings.

### Abstract

Scorpion stings are one of the commonly occurring medical problems worldwide includingour country. It is a treatable condition. The present study was conducted in the department of general medicine at a tertiary care hospital of western Maharashtra. The venom of scorpion is a clear, colourless and can be classified as either haemolytic or neurotoxic (Ahmad, 2015).

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Most of the stings are harmless and follow a benign clinical course, but some present with serious and acute life-threatening complication in respiratory, neurologic and cardiovascular systems. The leading causes of death related to scorpion envenomation are cardiac dysfunction and pulmonary edema (Gueron *et al.,* 1992).

### Aims and objectives

To study clinical presentation, complications and response to supportive management of in cases of scorpion bite

## MATERIALS AND METHODS

'Clinical profile of scorpion sting' a descriptive observational study was conducted in tertiary care hospital in western Maharashtra from September 2013 to December 2016. In this study period 30 cases with definitive history of scorpion sting were included. Cases were analyzed as per age, sex, occupation, timing of bite, symptoms, signs, systemic examination, investigations, treatment given, requirement of ventilator support, stay and outcome. Laboratory investigations done in these cases were complete blood count, urine

examination, renal function test, liver function test, blood sugar, serum electrolytes, chest x ray, electrocardiogram.

### Inclusion criteria's

- Age 14 years and more
- Patients with definitive history of scorpion sting
- Patients admitted during September 2013 to December 2016.

### Exclusion criteria

- Age less than 14 years
- Patients without definitive history of scorpion sting
- Associated systemic disease
- Cases admitted before September 2013 and after December 2016.

### Statistical analysis

Statistical analysis was done by descriptive statistics using simple ratio and percentages. Microsoft office 2010 was used to generate Tables.

## RESULTS

**Table 1. Sex wise distribution of cases**

| Sex | Males | Females | Total |
|---|---|---|---|
| Number of patients | 21 | 09 | 30 |
| Per cent of patients (%) | 70 | 30 | 100 |

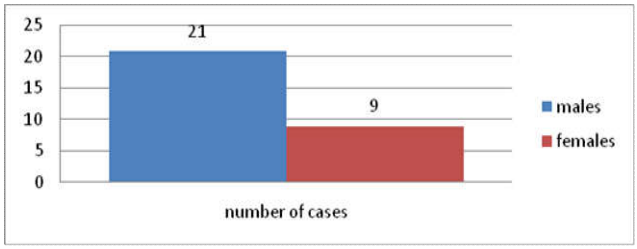


**Fig. 1. Sex wise distribution**

**Table 2. Age wise distribution of cases**

| Age(years) | No. Of patients | Percentage (%) |
|---|---|---|
| 14-20 | 02 | 06.67 |
| 21-30 | 05 | 16.67 |
| 31-40 | 15 | 50.00 |
| 41-50 | 03 | 10.00 |
| 51-60 | 04 | 13.33 |
| 61and above | 01 | 03.33 |
| Total | 30 | 100.00 |

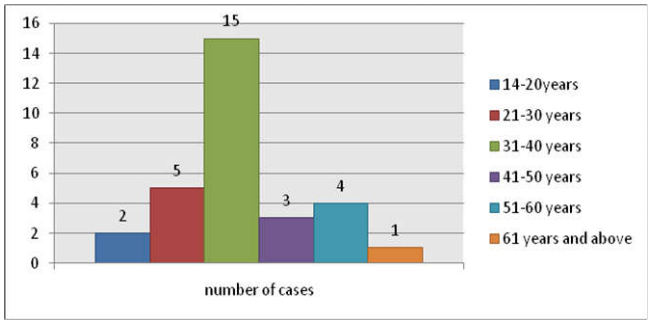


**Fig. 2. Age wise distribution**

**Table 3. Occupation wise distribution of cases**

| Occupation | Farmers | Housewives | Students | Drivers | Labours | Total |
|---|---|---|---|---|---|---|
| No. Of patients | 16 | 06 | 05 | 02 | 01 | 30 |
| Per cent of patients (%) | 53.33 | 20.0 | 16.67 | 06.67 | 03.33 | 100 |

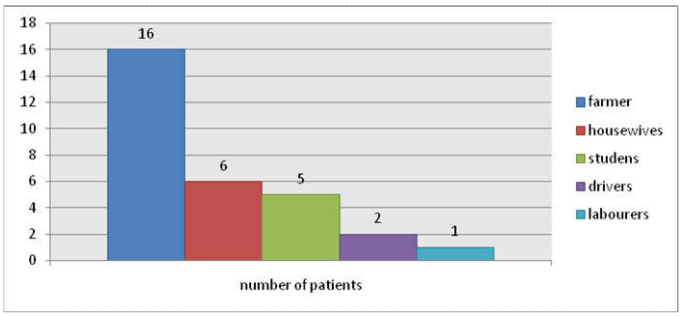


**Fig. 3. Occupation wise distribution**

**Table 4. timing of scorpion sing**

| Timing of bite | Daytime | Nocturnal | Total |
|---|---|---|---|
| No. Of patients | 18 | 12 | 30 |
| Per cent of patients (%) | 60.00 | 40.00 | 100 |

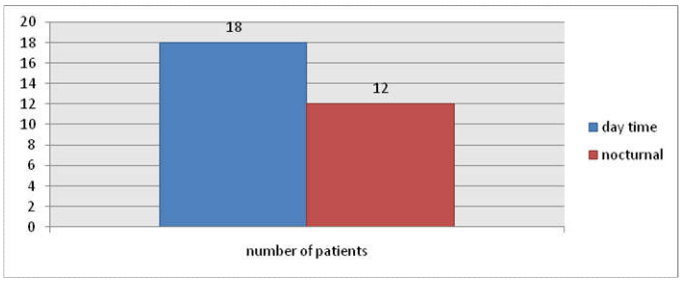


**Fig. 4. Timing of scorpion sing**

**Table 5. Site of scorpion sing**

| Site | Lower limb | Upper limb | Total |
|---|---|---|---|
| No. Of patients | 18 | 12 | 30 |
| Per cent of patients (%) | 60.00 | 40.00 | 100 |

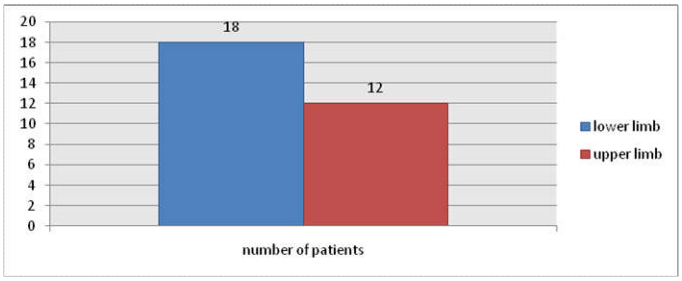


**Fig. 5. Site of scorpion sting**

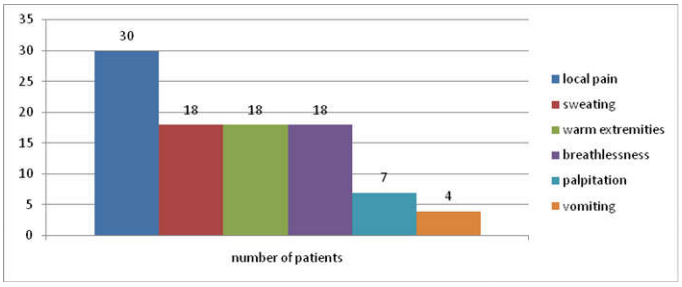


**Fig. 6. Incidence of symptoms in cases**

**Table 6. Incidence of symptoms in cases**

| Symptoms | Local pain | Warm extremities | Breathlessness | Sweating | Palpitation | Vomiting |
|---|---|---|---|---|---|---|
| Number of patients | 30 | 18 | 18 | 18 | 7 | 5 |
| Per cent of patients (%) | 100 | 60 | 60 | 60 | 23.33 | 13.33 |

**Table 7. Effect of scorpion sting on heart rate**

| Heart rate/min | Bradycardia | Normal | Tachycardia | Total |
|---|---|---|---|---|
| Number of patients | 05 | 07 | 18 | 30 |
| Per cent of patients (%) | 16.67 | 23.33 | 60.0 | 100 |

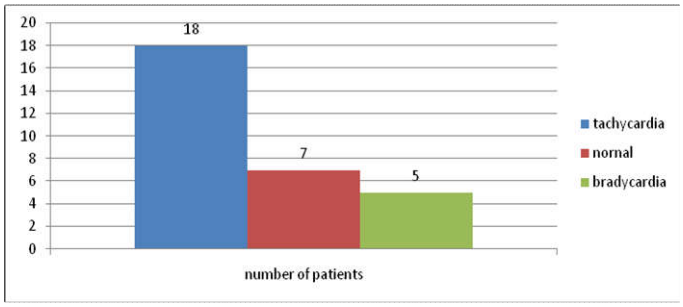


**Fig. 7. Effect of scorpion sting on heart rate**

**Table 8. Effect of scorpion sting on blood pressure**

| Blood pressure(mm of hg) | Normal | Hypotension | Hypertension | Total |
|---|---|---|---|---|
| Number of patients | 07 | 05 | 18 | 30 |
| Per cent of patients (%) | 23.33 | 16.67 | 60.00 | 100 |

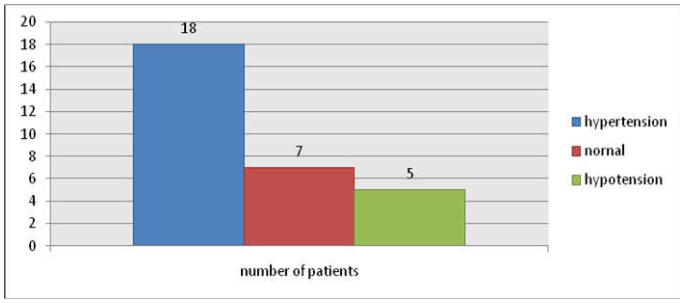


**Fig. 8. Effect of scorpion sting on blood pressure**

**Table 9. Effect of scorpion sting on body temperature**

| Temperature | Normal | Hypothermia | Hyperthermia | Total |
|---|---|---|---|---|
| Number of patients | 07 | 05 | 18 | 30 |
| Per cent of patients (%) | 23.33 | 16.67 | 60.00 | 100 |


**Fig. 9. Effect of scorpion sting on body temperature**

**Table 10. Effect of scorpion sting on the size of the pupils**

| Size of pupils | Normal | Mydriasis |
|---|---|---|
| Number of patients | 28 | 02 |
| Per cent of patients (%) | 93.33% | 06.67% |

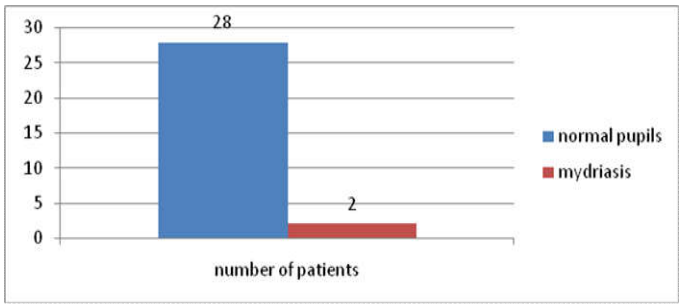


**Figure 10. Effect of scorpion sting on the size of the pupils**

**Table 11. Electrocardiogram finding in cases of scorpion sting**

| ECG | Sinus bradycardia | Normal | Sinus bradycardia | St depression | Ventricular Premature beats |
|---|---|---|---|---|---|
| Number of patients | 07 | 18 | 05 | 02 | 01 |
| Per cent of patients (%) | 23.33 | 60.00 | 16.67 | 06.67 | 03.33 |

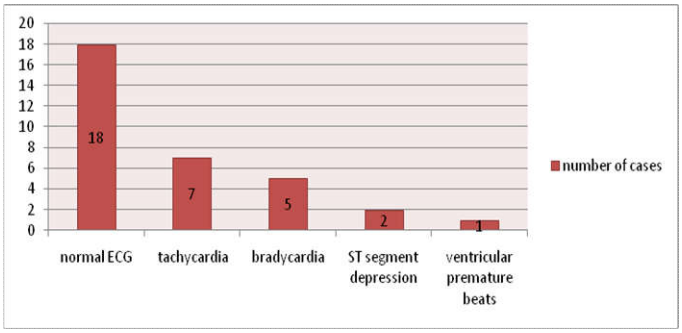


**Fig .11. Electrocardiogram in scorpion sting**

**Table 12. Chest x ray finding in cases of scorpion sting**

| Chest x-ray pa view | Normal | Pulmonary oedema |
|---|---|---|
| Number of patients | 28 | 02 |
| Per cent of patients (%) | 93.33 | 06.67 |

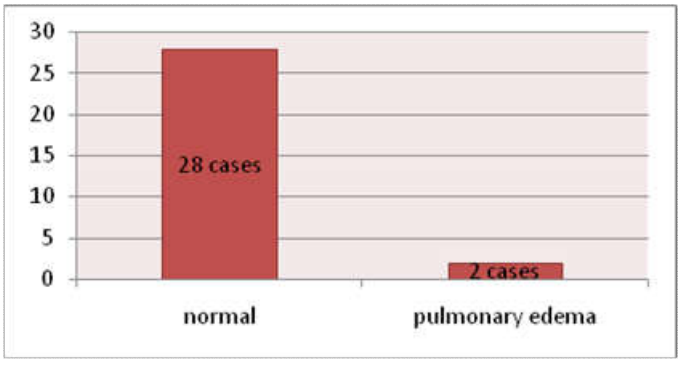


**Fig. 12. Chest X ray finding**

**Table 13. 2D ECHO finding in cases of scorpion sting**

| 2D ECHO | Normal | Reduced LVEF |
|---|---|---|
| Number of patients | 28 | 02 |
| Per cent of patients (%) | 93.33 | 06.66% |

**Table 14. Treatment given**

| Treatment given | Analgesics | Antibiotics | Diuretics | Ring block | Anti Ischemic |
|---|---|---|---|---|---|
| Number of patients | 30 | 30 | 02 | 18 | 02 |
| Per cent of patients (%) | 100 | 100 | 06.67% | 60.00 | 06.67% |

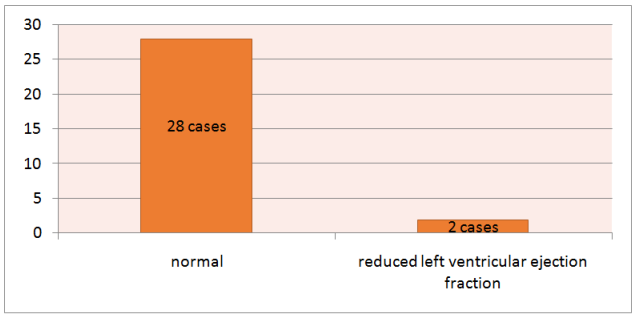


**Fig. 13. 2D ECHO finding**

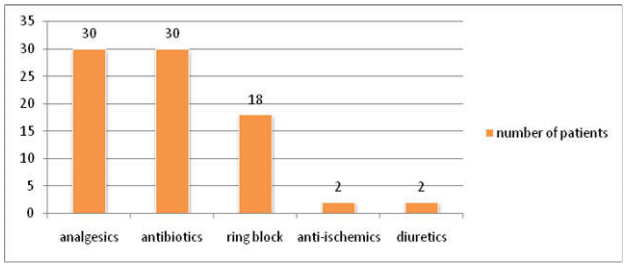


**Fig. 14. Treatment given**

**Table 15. Duration of hospital stay in cases of scorpion sting**

| Duration of hospital stay | 2days | 4days |
|---|---|---|
| Number of patients | 28 | 02 |
| Per cent of patients (%) | 93.33 | 06.67 |

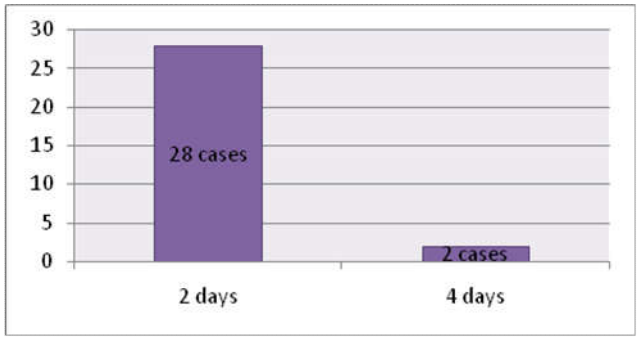


**Fig. 15. Duration of hospital stay**

**Table 16. Outcome in cases of scorpion sting**

| | Recovery | Complications | Mortality |
|---|---|---|---|
| Number of patients | 30 | 02 | 00 |
| Per cent of patients (%) | 100 | 06.67 | 00 |

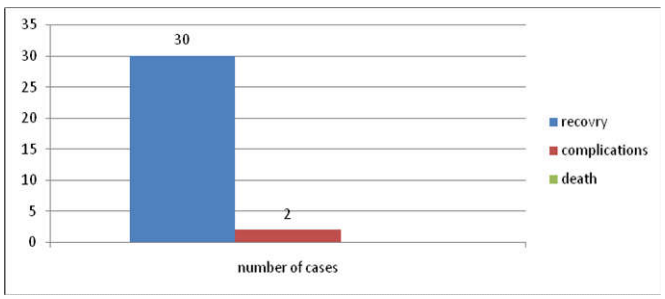


**Fig. 16. Outcome in cases of scorpion sting**

## DISCUSSION

This study 'clinical profile of scorpion sting' an observational study was conducted in tertiary hospital in Maharashtra from September 2013 to December 2016. In this study period 30 cases of scorpion sting were evaluated for their clinical presentation, management and outcome.

**Sex prevalence: (Table 1)**

Maximum number of victims of poisoning in our study was male patients. There were 21(70.00%) male patients and 9(30.00%) patients were females. The male to female ratio was 2.33. Our findings correlate with the study done by Al-Sadoon *et al.,* 2003 where the incidence of scorpion sting in males was 61.79 percent.

**Age prevalence**: **(Table 2)**

Maximum number of cases in our study was in the age group of 31 to 40 years. There were total 15 cases in this age group. Next highest number of cases was seen in the age group of 21-30 years with a count of 5 cases. There were 4 cases in sixth decade, 3 cases in fifth decade, 2 cases in second decade and single case in seventh decade. Our study correlates with the study done by Khatami *et al* according to which maximum number of cases was in the age group of 30-40 years (Khatony *et al.,* 2015).

**Occupation prevalence: (Table 3)**

In our study maximum number of patients 16(53.33%) were farmers. Followed by 6(20.00%) cases were housewives. 5(16.67%) cases were students. 2 (06.67%) cases were truck drivers and 1. (03.33%) case was labourer. In this study the incidence of scorpion sting was more in farmers as farmers are in more contact with scorpions as compared to others. Our study correlates with the study done by Kumar *et al*. 2013 where the highest incidence of scorpion bite was in the farmers and it was 85%.

**Site of scorpion sting: (Table 4)**

In the present study maximum number of cases had scorpion sting on lower limbs .lower limb was involved in 18 (60.00%) cases, while lower limb was involved in remaining12 (40.00%) cases. Our findings correlate with the study done by Kumar *et al*., 2013 where the incidence of scorpion sting in lower limb was 65%.

**Timing of scorpion sting: (Table 5)**

Maximum number of cases in this study had scorpion sting at day time with a count of eighteen cases. The remaining 12 cases had nocturnal sting. Our findings correlate with the study done by Al-Sadoon *et al.,* 2003 where the incidence of scorpion sting was highest at day time.

**Incidence of symptoms in scorpion sting: (Table 6)**

Local pain was common symptom and was present in all cases. Warm extremities, sweating, breathlessness was present in 18 (60.00) cases. Palpitation was seen in 7(23.33%) and vomiting was seen in 5(16.67%) cases. Our study correlates with the study done by Himmatrao saluba *et al.,* 2012. Vomiting is due to autonomic storm often seen in a patient envenomed scorpion. Vomiting is due to serotonin content of venom (Tiwari *et al.,* 2009). Profuse sweating: sweat literally flows all over body clinically it is called "skin diarrhoea". Sweating persist for 3-17 hours (Bawaskar and Bawakar, 2000).

**Effect of scorpion sting on heart rate: (Table 7)**

In this study tachycardia was present in maximum number of (60.00%) cases. Bradycardia was present in 7 (23.33%) cases and normal heart rate was seen in 5(16.67%) cases. Our study correlates with the study done by Himmatrao saluba *et al.,* 2012 tarchycardia occurs due to the action of excessively circulating catecholamine 5 and their action on beta adrenergic receptor (Bahloul *et al.,* 2010).

**Effect of scorpion sting on blood pressure: (Table 8)**

Hypertension was commonest blood pressure finding seen in 60% of cases. 5(16.67%) cases had hypotension. Normal blood pressure was present in 7(23.33) cases. Our study correlates with the study done by Himmatrao saluba *et al.,* 2012 stimulation of alpha adrenergic receptor is the main reason for development of hypertension (Frire-_maia *et al.,* 1974).

**Effect of scorpion sting on body temperature: (Table 9)**

Maximum number of cases in this study had raised body temperature. It was seen in 18 cases accounting for 60% of cases. Hypothermia was seen in 5 cases accounting for 16.67%. Normal body temperature was seen in 7 cases accounting for 23.3% of cases. This study correlates with the study done by Ismail *et al.,* 1990 where there were highest incidence of hyperthermia as that of normal temperature and hypothermia. Overstimulation of the sympathetic system increases blood levels of catecholamine's, resulting in a hyperthermia state (Chippaux, 2012).

**Effect of scorpion sting on size of the pupils:(Table 10)**

Maximum number of cases (n=28) in this study had normal pupils. Only two cases had mydriasis accounting for 6.67%. Pupillary effects are due to alpha receptor stimulation of dilator pupillary muscles by excessive circulating catecholamine (Ouanes –Basbes *et al.,* 2005). Our study correlates with the study done by Bawashar *et al.,* 2012

**Electrocardiogram findings in cases of scorpion sting: (Table 11)**

In this study 18(60.00%) cases had normal electrocardiogram. Sinus tachycardia was seen in 7 (23.33 %) cases and sinus bradycardia was seen in 5 (16.67%) cases. ST segment depression was seen in 2 (06.67%) cases and one (03.33%) patient had ventricular premature beat. Troponin t was done in cases with ST depression and they were equivocal which was suggestive of myocarditis. Our study correlates with study done by Ahmadnoor abdi *et al.,* 2013 where 68.9% cases had normal electrocardiogram and premature ventricular beat was seen in 13.9% and ST depression was seen in 9.3% cases.

Scorpion sting induced release of vasoactive, inflammatory and chromogenic peptides and amine constituents (histamine, serotonin, bradykinin, leukotrienes, thromboxane), which act on the coronary vasculature and induce coronary artery vasospasm and facilitate platelet aggregation as well as thrombosis. Direct cardiotoxic effect of the venom causing toxic myocarditis by reduction of Na-K-ATPase and adrenergic myocarditis by releasing adrenaline and noradrenaline from neurons, ganglia and adrenals, thereby increasing myocardial oxygen demand by direct inotropic and chronotropic effect on already compromised myocardial blood supply (Rahav and Weiss, 1990).

**Chest x-ray finding in cases of scorpion sting: (Table 12)**

Maximum number (n=28) of cases had normal chest xray. Only 2(06.67%) cases had pulmonary edema. Our study correlates with study done by Maheshwari *et al.,* 2012 where one of the case had pulmonary edema. In our study both the cases had unilateral pulmonary oedema. They responded well to diuretics and pulmonary oedema resolved completely in four days.

**Echocardiogram findings in cases of scorpion sting (Table 13)**

Maximum number (n=28) of cases had normal chest echocardiogram. Only 2(06.67%) cases had reduced left ventricular ejection fraction in the form of 40% and 35% which resolved completely at the time of discharge. Our study correlates with study done by Maheshwari *et al.,* 2012 where a patient had left ventricular ejection fraction of 28%.

**Treatment given in cases of scorpion sting: (Table 14)**

Hydration and analgesics were main stay of treatment and was given to all the patients. Anti-ischemic and diuretics were given in 2 cases as they had equivocal elevation of troponin T, with pulmonary edema. For excessive local tenderness ring block was given in 18(60.00%) of case.

**Duration of hospital stay: (Table 15)**

Among all the admitted cases 28 (93.33%) of cases were discharged on second day. Two case developed pulmonary oedema, but they improved drastically on third day and were discharged on fourth day.

**Outcome in cases of scorpion sting: (Table 16)**

There was no mortality in our study. None of them required mechanical ventilation.

**Conclusion**

Scorpion stings are more common in males. Maximum patients are in age group of fourth decade. Incidence is high in farmers. Maximum number of cases had scorpion sting on lower limb. Stings are more at the day time. Local pain, breathlessness, sweating and redness of local ares are the commonest symptom. Tachycardia, hypertension and hyperthermia are common signs. Mydriasis is rare. Electrocardiogram are

normal except few had ST segment depression and ventricular premature beats. Myocarditis and pulmonary oedema are rare complication which is treatable.

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