

A Rare Complication : Scorpion Sting Induced Myocarditis and Pulmonary Edema In Vidharbha Region

Salame R N¹, Ghodeswar S S², Hiwarale S P³

ABSTRACT

Scorpion stings are more common in our India as well as other countries. Usually, these bites are harmless generally seen with a set of simple clinical findings, such as pain, oedema, numbness, and tenderness in the area of the sting but rarely have serious clinical sequelae, including myocarditis, acute heart failure, acute pulmonary oedema, and Acute Respiratory Distress Syndrome (ARDS) and are a significant problem which determine mortality and morbidity. The case presented here was a 20-year-old man who developed myocarditis, hypotension and acute pulmonary oedema following a scorpion sting on the right great toe. Which was successfully treated with inotropes, digoxin, diuretics and prazosin.

Introduction :

There are about 1,500 species of scorpions worldwide, out of these 50 are dangerous to human. Among 86 species of scorpions present in India, *Mesobuthus tumulus* (Indian red scorpion) and *Heterometrus swammerdami* are of medical importance¹. Most of the deaths due to scorpion envenomation are attributed to cardiopulmonary complications like myocarditis and acute pulmonary edema. Black scorpion are more common in Vidarbha region than red scorpion². Scorpion stings causes a wide range of manifestation, from local skin reaction to neurological, respiratory and cardiovascular collapse. Cardiovascular effect are particularly prominent after stings by Indian red scorpion (*M. tamulus*)³.

Here we present a case of scorpion bite that has induced myocarditis and pulmonary edema in young male patient which is a rarely found in Vidarbha region.

Case Report :

A 20-year-old male patient resident of Ghatanji, Dist. Yavatmal, was stung by a scorpion on the Right

great toe and presented with intense pain on the local site. Two hours after scorpion sting Patient developed breathlessness, profuse sweating and altered sensorium for which Patient was referred from rural hospital to tertiary care center. On admission patients clinical examinations was pulse rate 130 beats / minute regular, respiratory rate 30 / mins abdomino-thoracic and blood pressure 70 mmHg systolic, SPO₂-70% on room air, extremities were cold, he had cyanosis. On Respiratory systemic examination on auscultation bilateral coarse crepitation were present, On cardiovascular examinations loud S3 gallop at apex were present, no obvious murmur were heard. Per abdominal examination, there was no organomegaly. On nervous system examination, except altered sensorium, no neurodeficit was seen.

Laboratory results were as follows : Hemoglobin was 13.9 g/dl, white blood cell count was 19880 cells / mm³, platelet count was 205,000 cells / mm³. RBSL - 124 mg/dL, Total Bilirubin - 0.8mg/dL, Blood urea 56 mg/dl, serum creatinine 1.6 mg/dl, aspartate transaminase 43 U/l, alanine transaminase 39 U/l, CPK-MB 165 U/l (0-24 U/l), Sr Na⁺-142 mmol/L, Sr K⁺- 3.6 mmol/L. Chest X-ray (*fig. 1*) demonstrated bilateral fluffy shadows indicative of pulmonary edema. An electrocardiogram (ECG) on admission (*fig. 2*) revealed sinus tachycardia and ST-T wave changes, T wave inversion in I, aVL and occasional VPC's (*fig. 3*), QTc = 0.49sec. Echocardiography reveals no RWMA.

¹Assistant Professor, ²Associate Professor, ³Resident Department of Medicine, SVNGMC, Yavatmal.

Address for Correspondence -

Dr. Rohit Salame

E-mail : rohit1241986@gmail.com

In accordance with these symptoms and findings, a diagnosis of Scorpion sting induced Myocarditis and pulmonary edema was made.

Figure 1 : Chest X Ray PA on admission



Figure 2 : ECG Day-1

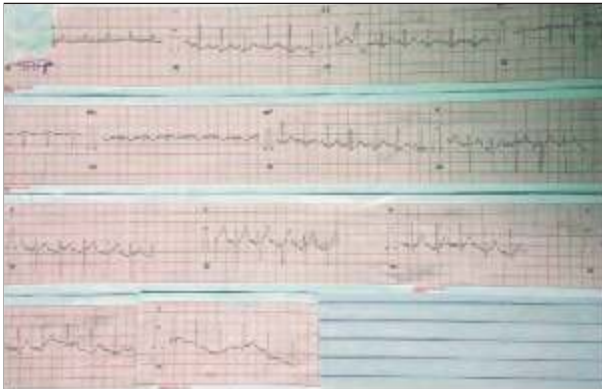
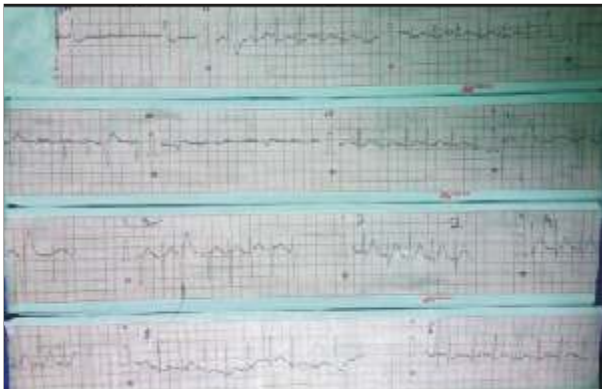


Figure 3 : ECG Day1-After 8 Hrs



Patient was admitted in ICCU and treated with O2 inhalation, Inotropes, diuretics, prazosin and steroids were given. With above treatment, patient's status improved over period of 3 days. Repeat chest X-ray (*fig. 4*) was clear within 48hr hours of initiating this treatment. Serial ECG was taken for monitoring and ECG on 4th day was normal (*fig. 5*). Blood pressure was maintained without inotropic support and patient was kept for 2 days for observation. Patient was then discharged and followed was up after 15 days uneventfully.

Figure 4 : Chest X Ray on Discharge



Figure 5 : ECG Day on Discharge



Discussion :

Scorpion venom may contain multiple toxin-like neurotoxin, cardiotoxin, nephrotoxin and hemolytic toxin. The primary targets of scorpion venom are

voltage-dependent ion channels. The long-chain polypeptide neurotoxin causes stabilization of voltage dependent sodium channels in the open state leading to continuous, prolonged, repetitive firing of the somatic, sympathetic, and parasympathetic neurons results in autonomic and neuromuscular over excitation symptoms due to release of excessive neurotransmitters such as epinephrine, norepinephrine, acetylcholine glutamate and aspartate. Transit parasympathetic manifestations like vomiting, salivation, profuse sweating, hypotension, bradycardia, priapism, VPC's. Long term sympathetic manifestations like tachycardia, cold extremities, hypertension, pulmonary edema observed.

Unopposed α -receptors stimulation lead to free radical accumulation that are injurious to myocardium. The pathologic conditions revealed a mixed picture of toxic

Three possible mechanisms might explain cardiac dysfunction, including adrenergic myocarditis, toxic myocarditis and myocardial ischemia. Alpha-receptor stimulation by toxins play a major role in development of tachycardia, myocardial dysfunction and pulmonary edema⁶. Scorpion toxins targeted against the sarcoplasmic reticulum Ca (2+)-release channel of skeletal and cardiac muscle⁷.

Ismail, M, et al; studied on red scorpion bite cases and observed 50% cases exhibited myocarditis, 12.5% had subclinical disease, and 63% had observable ECG changes due to scorpion sting. [8]

We observed both ECG changes and myocarditis in this case. Supportive therapies consist of conventional management of left ventricular failure and pulmonary edema.

Conclusion :

Scorpion stings are frequently seen in our country and the stings of scorpions living in some regions

may be fatal. We report here the case of a 20-year-old male who developed life-threatening, acute toxic myocarditis and pulmonary edema, after a scorpion bite. Aggressive medical treatment with inotropic agents, diuretics, prazosin and parenteral corticosteroids resulted in rapid clinical resolution. As there are very few cases of scorpion sting induced Myocarditis, it is necessary to monitor closely the electrocardiographic changes of the patient periodically.

References :

1. Erfati P. Epidemiology, symptomatology and treatment of buthinae stings. In : Arthropod Venoms. Handbook of Experimental Pharmacology. Bettini S (Ed.), Springer-Verlag: New York 1978; p.312-5.
2. Bawaskar HS, Bawaskar PH. Sting by red scorpion in Maharashtra state . India. A Clinical study. Trans R Soc Trop Med Hyg. 1989 Nov Dec; 83(6):858-860.
3. Bawaskar HS, Bawaskar PH. Indian red scorpion envenoming. Indian J Pediatr 1998; 65(3):383-91.
4. Mundle PM. Pulmonary edema following scorpion stings. Br Med J. 1961; 1:1042.
5. Gueron M, Yaron R. Cardiovascular manifestations of severe scorpion sting. Clinicopathologic correlations. Chest 1970; 57(2):156-62.
6. Bawaskar HS, Bawaskar PH. Management of the cardiovascular manifestations of poisoning by the Indian red scorpion (*Mesobuthus tamulus*). Br Heart J 1992; 68(5):478-80.
7. Valdivia HH, Kirby MS, Lederer WJ, Coronado R. Scorpion toxins targeted against the sarcoplasmic reticulum Ca(2+)-release channel of skeletal and cardiac muscle. Proc Natl Acad Sci U S A 1992; 89(24):12185.
8. Ismail, M., El Asmar, M. F. and Osman, O. H. Pharmacological studies with scorpion venom; evidence for the presence of histamine. Toxicon., 13: 49-56. 1975.