International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2016): 79.57 | Impact Factor (2015): 6.391

Autopsy Case Findings in Fatal Scorpion Bite

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Abstract: ***Scorpion bite is a major public health problem in many developing countries like India especially in kokan areas, leading to life threatening complications. Delay in recognition and the hypoxemia increase the morbidity and mortality. Here we report a case of severe scorpion bite in a 4 year old child causing myocarditis accompanied with acute pulmonary edema and acute tubular necrosis leading to death. This case report will help the clinicians to know the organ systems which are affected in scorpion bite that lead to serious life threatening complications and guide them in their management reducing the mortality.***

Keywords: Scorpion bite, Myocarditis, Pulmonary oedema

1. Introduction

Globally the scorpion bite annual incidence has been estimated at around 1.2 million and Indian records suggest that approximately 10000 people die every year, where it is a commonest health problem in rural India [1,2,3]. There are about 1500 species of scorpions worldwide, out of these 50 are dangerous to human. Among 86 species in India, *Mesobuthus tamulus* (Indian red scorpion) and *Heterometrus swammerdami* are of medical importance [4].

Scorpion bite may present with mild local swelling to severe systemic symptoms. Systemic manifestations of scorpion bite are mostly due to cardiac and respiratory toxicity like myocarditis, acute pulmonary edema etc. Severity of symptoms depends upon the size of the victim, season, and time lapse between bite and hospitalization [5, 6, 7, 8]. It can be at times life threatening emergency in children and old age people.

2. Case Report

A 4 years male child was admitted in paediatric ICU with history of a scorpion bite to dorsal aspect of base of the left little toe 8-10 hours before admission. He had complaints of sweating, vomittings, epigastric pain, breathlessness and palpitations. The child died within 24 hours of admission. Autopsy examination was carried out to know the exact cause of death.

Autopsy Findings

The child was diagnosed clinically as scorpion bite and treated accordingly. Autopsy examination was performed by forensic experts. On external examination**,** there was thickening and pigmentation of the skin of size 1x1cm over the dorsal aspect of base of the left little toe. The subcutaneous tissue was found to be normal on dissection. Internal examination showed all organs were in their normal anatomical position. No congenital anomalies were present. Multiple petechial hemorrhages were seen over pretracheal region, anterior and posterior surfaces of both lungs and brain parenchyma. Lungs and brain were congested and edematous. The heart was of normal size and weight for the age, coronaries were patent, and there were no valvular deformities. Rest of the internal organs were found to be intact and congested.

Microscopy of left atrium and papillary muscle showed mononuclear cell infiltration in cardiomyocytes with myocytolysis which is a characteristic feature of myocarditis [Fig.1]. Sections from lungs showed alveoli filled with oedema fluid. Few alveoli showed hemosiderin laden macrophages. Vessels were congested and showed emboli. These microscopic features of lungs are suggestive of acute pulmonary oedema [Fig.2]. Sections from kidneys showed necrosis of tubular epithelium [Fig.3]. Sections from rest of the organs showed normal histology.

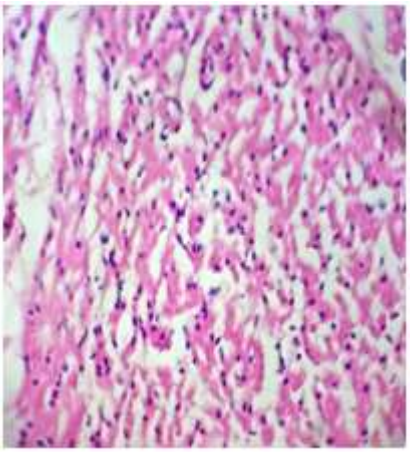

Figure 1: Left atrium showing mononuclear cell infiltration in cardiomyocytes with myocytolysis suggestive of myocarditis. (H & E, 40x)

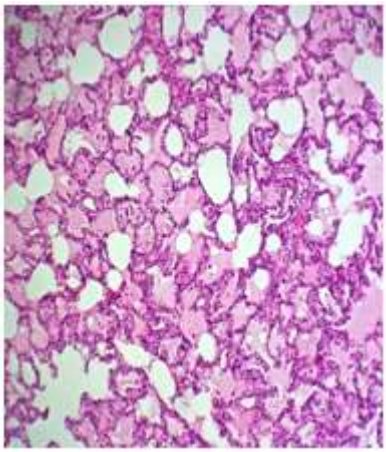

Figure 2: Lungs showing alveoli filled with fluid suggestive of pulmonary oedema.(H & E,40x)

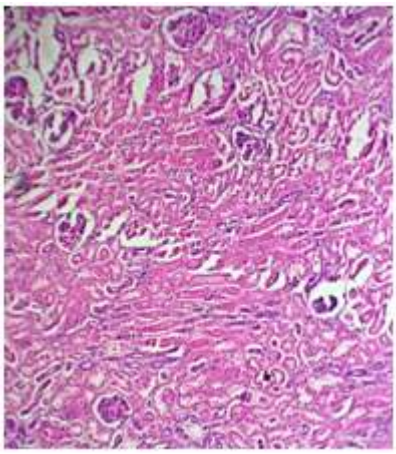

Figure 3: Kidneys showing necrosis of tubular epithelium.(H & E,40x)

3. Discussion

Scorpion bite is an occupational hazard in villagers, migrating population and people living in slum areas. The severity of a scorpion bite depends upon the ratio of the venom to the body weight of the victims. A smaller child with lower body weight and a larger ratio of venom to body weight lead to a more severe reaction. A mortality rate of 20% is reported in untreated babies, 10% in untreated school-aged children and 1% in untreated adults [1]. The scorpion venom is a water soluble antigenic complex mixture of neurotoxin, cardiotoxin, nephrotoxin, phosphodiesterases, phospholipase, hyaluronidases, histamine, serotonin and other chemicals [9]. Although most species are non poisonous, some species can be really life threatening especially in children and old age because of their lower body mass index.

The clinical presentation of scorpion bite which is known as "Scorpion sting syndrome" was defined by Neale [10]. The typical manifestation can be described as local pain, swelling and redness and followed by systemic symptoms which most often include hypertension and or tachycardia, often with anxiety, nausea and epigastric pain. Most of the deaths due to scorpion bites are attributed to cardiopulmonary complications like myocarditis and acute pulmonary edema as in our case [11]. Most deaths occur during the first 24 hours after the bite and are secondary to respiratory or cardiovascular failure resulting from autonomic excitation. Cardiac dysfunctions are due to catecholamine-induced increases in myocardial metabolism and oxygen demand. It leads to myocardial ischemia-induced myocardial hypoperfusion and to the direct effects of the toxin (leading to myocarditis) [12]. The direct cardiotoxic effect of venom can cause myocarditis by reduction of Na+-K+-ATPase and by releasing adrenaline and noradrenaline from neurons, ganglia and adrenals, thus increasing myocardial oxygen demand by direct chronotropic and inotropic effect on already compromised myocardial blood supply [13]. The venom is a powerful arrhythmogenic agent. Myocardial ischemia is not only due to the release of catecholamines but also due to effect of cytokines and/or neuropeptide Y on coronary vessels. Hyperglycemia may also contribute to myocardial injury [14]. Pulmonary edema and acute tubular necrosis develops secondary to myocarditis and acute left ventricular dysfunction [15].

4. Conclusion

In the absence of other causes of death, from the history available, clinical, autopsy and microscopic findings, cause of death was concluded to be due to myocarditis with pulmonary oedema with acute tubular necrosis arising as a complication of scorpion bite. Hence preventive measures should be undertaken to avoid scorpion bite. Patient's early approach to hospital and early diagnosis of deadly complications of scorpion bite is absolutely essential in order to decrease the mortality. This case study will aware the clinicians about the organ systems involved in scorpion bite and help them in better management of these cases.

References

[1] Kumar L, Naik SK, Agarwal SS, Bastia BK**.** Autopsy Diagnosis of a Death due to Scorpion Stinging – A Case Report. J Forensic Leg Med. 2012; 19:494–6.
[2] Chippaux JP, Goyffon M. Epidemiology of Scorpionism: A Global Appraisal. Acta Trop 2008; 107(2):71-9.
[3] Bisarya, B. N., Vasavada, J. P., Bhat,. A., Nair, P. N. R. and Sharma, V. K.: Hemiplegia and myocarditis following scorpion bite. Indian Heart J., 29: 97-100, 1977.
[4] Erfati P. Epidemiology, symptomatolgy and treatment of buthinae stings. In: Bettini S, editor. Arthropod Venoms: Hand Book of Experimental Pharmacology. New York: Spring Verlag; 1978. p. 312-5.
[5] Bawaskar, H.S. and Bawaskar, P.H. Stings by red scorpion *(Buthotus tamulus)* in Maharashtra state, India, a clinical study. *Trans R Soc Trop Med Hyg* 1989; 83, 855-60.
[6] Gueron, M. and Waizmann, S. Catecholamines and myocardial damage in scorpion sting. *Am Heart* Jl969; 75, 716-17.
[7] Bawaskar, H.S. and Bawaskar, P.H. Prazosin for vasodilator treatment of acute pulmonary oedema due to scorpion sting. *Ann Trop Med Parasitol1987;* 81, 719-23.
[8] Gueron, M., Adolph, R., Grupp, I., Grupp, 0., Gabel, M. and Fowler, N.O. Hemodynamic and myocardial consequences of scorpion venom. *Am J Cardiol1980;* 45, 979-86.
[9] Bawaskar HS, Bawaskar PH. Scorpion sting. J Assoc Physicians India 1998;46:388-92.
[10] Neale JR.Scorpion Sting syndrome in Eastean Riyadh.*Ann Saudi Med* 1990;**10**:383-8.
[11] Bawaskar HS, Bawaskar PH. Scorpion envenomation and the cardiovascular system. *Tropical Doctor* 1997; **27**:6-9.
[12] Satyawali V, Pandey S, Prakash C, Singh Y. Scorpion sting masquerading as myocardial infarction. J Indian Academy of Forensic Medicine. 2014;36:89-91.
[13] Rahav G, Weiss AT. Scorpion sting-induced pulmonary edema. Scintigraphic evidence of cardiac dysfunction. Chest. 1990;97:1478-1480.
[14] 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. 1992;89:12185-12189.

[15] Gueron M, Ovsyhcher I. What is the treatment for the cardiovascular manifestations of scorpion envenomation? *Toxicon* 1987 ; **25**: 121-4.