



A Case Report on Cardiotoxic Scorpion Sting

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Introduction:

Scorpion sting is very common in India. There are more than 1250 species of scorpion in world and more than 100 of them are found in India. The Indian red scorpion (*Mesobuthus tumulus*) produces neurotoxin and cardiotoxin while *Palmnæus gravimanus* inflicts painful sting without systemic envenoming. Identification of the species is very useful and key to management. Clinical scenario ranges from just mild irritation at local sites to very severe life threatening heart failure. Here by we are discussing a case of scorpion bite which was complicated by severe heart failure and treated successfully in intensive care unit of Vadilal Sarabhai hospital

A case report on cardiotoxic scorpion sting

A 14 year old young hindu male school student residing at Gandhinagar presented to casualty with complain of nausea, vomiting and breathlessness and he gave history that he he was bitten by approximately 6 cm long brightly red brown coloured scorpion 12 hours back(?Indian Red Scorpion). Patient was very apprehensive and restless. He was also tachypneic with respiratory rate 34/min. BP was 90/60 mm Hg.

On respiratory system examination patient was having severe crepitations all over the chest field(even in upper zones).Considering the criticality of the situation and restless of the patient. He was sedated and intubated urgently and it was found that from the endotracheal tube froth was coming out continuously. Diagnosis of severe pulmonary edema made and patient was put on volume assisted control mode of ventilator and vigorous suctioning done.

Ryle's tube inserted and during the attempt of catheterization penis was erect(priapism)which is very unusual in mildly sedated patient. So,patient was in parasympathetic autonomic storm phase of scorpion venom toxicity.Sting was on right upper extremity and there was only one hole in the reddened area, there were no local signs like edema.Immediate help from cardiology department sought. Portable 2-D Echocardiography was performed by cardiologist, ejection fraction was only 18% and on his advice ionotropes started and once BP had reached 100/70 mm Hg patient was given 250 micrograms of prazosine through Ryle's tube and 1 ampoule of furosemide stat. Patient was shifted to intensive care unit where further treatment was given as a case of severe heart failure.Eventually patient improved and after 3 days patient was extubated and shifted to general medical ward. On 5th day of admission follow up detailed echo performed and ejection fraction was 69%.Further recovery was uneventful and patient was sent back to home.

Discussion:

Scorpions are arachnids(a subgroup of the eight legged arthropods) and have a hollow sting in the last joint of their tail,which communicates by means of a duct with the poisonous glands,which secretes poison on stinging.The venom is clear and colourless mixture of various proteins.These proteins acts mainly on sodium,potassium and calcium channel.(15 such proteins are recognized in *Centruoides* spp and 22 in *Mesobuthus* spp).

So,in short it causes cardiotoxicity by changing permeability of sodium and calcium in heart,neurotoxicity by inhibiting effective transmission of sodium and potassium across nerve cell membrane. Sodium also affects homeostasis by kidney and calcium affects

the muscle and is an important secondary messenger.Some species(*Heterometrus scaber*)contains phospholipase.Thus they possess haemolytic activity.The other contents are acid phosphatase,ribonuclease,acetylcholinesterase and other proteolytic enzymes.however,there is a peculiar absence of DNase activity in venom studies so far.

Toxicity of scorpion venom is more than snake venom but normally much smaller quantity is injected.Considering the composition it shares many similarities with snake envenomation and haemolytic toxin containing species causes local reaction as seen with viper bite and neurotoxin containing species causes effects like cobra bite.

The lethality of scorpion venom depends on the factors such as species of the scorpion, site of the sting, dose of the venom injected, season during which bite has occurred.

The most common species in India is *Mesobuthus tumulus* and it's toxins such as *Iberiotoxin* and *Tamsulotoxin* are selective inhibitors of potassium channels and that's why causes intense and persistent depolarization of autonomic nerves which is characterised by transient parasympathetic (vomiting, profuse sweating, ropy salivation, bradycardia,priapism and hypotension)and prolonged sympathetic(cold extremities,hypertension,tachycardia,pulmonary edema and shock).

Conclusion:

Apart from the case mentioned here we have seen many patients of scorpion sting where patients have only local discomfort and when probed in detail most of them told that the scorpion was black coloured.These type of patients were managed by local anaesthetic injection and other supportive treatment either on OPD basis or in the general medical ward and we have also observed few cases of severe neurotoxicity and haemolytic toxicity(necrotising fasciitis) which are out of the scope of this article.

Anti venoms available commercially in many countries including India .They claim to reverse the cranial nerve dysfunction and myopathy but pain,paresthesia and cardiac side effects are not reversed by them.Recently it is proved that they are no better than a placebo and even author's personal experience suggests that it should better not to be used as use is associated with anaphylaxis and it can not prevent life threatening autonomic storm nor heart failure caused by venom.It will just add an economical burden to the patient.

Prazosine is proved to be the wonder drug for the treatment as it's pharmacological properties (selective alpha-one blocker)can reverse the haemodynamic,hormonal and metabolic toxic effects of scorpion venom. Unlike western literature where nifedipine,hydralazine,nitroglycerine and prazosine are considered as treatment options Indian textbooks clearly indicates prazosine as a drug of choice over other options.(atleast for Indian Red Scorpion!!!).However it needs further confirmation by large scale study.

REFERENCES

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