p-ISSN: 0973-3558, e-ISSN: 0973-3566

Case Report

Dilemma in unknown bites: a case of scorpion sting with multiple cerebral and cerebellar infarcts

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Article Info

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How to cite this article : Narendra S.S., Dileep C.N., Dilemma in unknown bites: a case of scorpion sting with multiple cerebral and cerebellar infarcts

J Ind. Soc. Toxicolo 2023;19(2):21-23

Abstract

Scorpion stings are one of the common emergencies that can present to emergency room in tropical regions like India. Even though many of the stings only produce severe local pain and parasthesia, severe systemic envenomation can occur at times which can be life threatening. Since most of the patients are from the rural areas early diagnosis of unknown bites are usually difficult due lack of medical expertise in many areas. Here we report a case of scorpion sting with severe systematic envenomation who presented as an unknown bite with suspected neurotoxic snake bite who later developed ischemic infarcts in thalamus, frontoparietal lobes and cerebellum associated with microbleeds. Cerebrovascular complications like ischemic infarcts and intracranial hemorrhage secondary to scorpion sting are rare. Infarcts can occur due to various mechanisms like cerebral vasospasm, embolic secondary to myocarditis, disseminated intravascular coagulation etc.

Keywords: Scorpion sting, myocarditis, Cerebrovascular complications, Mesobuthus tamulus

Introduction

Scorpion sting is one of the life threatening emergencies that can present to emergency room in tropical regions. Among the approximately thirty species of scorpions that are hazardous to humans, Mesobuthus tamulus is responsible for majority of the serious envenomations in India.[1] Most scorpion stings result in severe local pain and paraesthesia. Severe systemic envenomation from scorpion stings are predominantly a result of excessive stimulation of autonomic nervous system and neuromuscular excitation.[2] Cerebrovascular incidents rare complications associated with scorpion stings with ischemic stroke being present in 2-4% cases of scorpion stings referred to tertiary care hospitals.[3,4] Unknown bites or stings occurring in rural areas particularly pose a challenge due to the lack of emergency and specialised health care which result delay in diagnosis and thus early administration of specific medications and anti-venom. This case report presents a case of severe scorpion envenomation which presented as an unknown bite who later developed multiple ischemic infarcts of cerebral cortex.

Case Report

A 62 year old male patient was brought to the emergency room with a history of unknown bite to the right hand 4 hours ago. Patient had 2

episodes of blood tinged vomiting and frothing from mouth. He was intubated at an outside hospital in view of respiratory distress and reduced consciousness and was transfused with 10 vials of polyvalent anti snake venom suspecting neurotoxic snake bite and was referred for further management.

On arrival to emergency room patient was unconscious on mechanical ventilation with a pulse rate of 124bpm and a blood pressure of 170/96 mmHg.Respiratory system examination showed crepitations in the bilateral basal lung fields. Cardio vascular system examination revealed no murmur with normal S1 and S2. Per abdomen examination was within normal limits with no organomegaly. Central nervous system examination at arrival patient had absent eye opening and withdrawal response to painful stimuli. There was no significant local reaction and bite marks could not be visualised. A bed side 20 minute whole blood clotting time was performed which showed prolongation.

Investigations

Initial arterial blood gas showed a pH of 7.31, PCO2 of 40.1mmHg, pO2 of 388mmHg, Lactate of 2.1 mmol/L and a bicarbonate of 20.1 mmol/L. Initial electrocardiography showed sinus tachycardia.Initial investigations showed an elevated total counts of 21270 cells/cumm with Hb of 13.1 gm/dl and a platelet count of 2.7 Lakhs/cumm. Initial PT, aPTT values were not recordable and INR not calculated. Initial Renal and Liver function tests were within normal limits.Echocardiography of heartshowed severe global hypokinesia of left ventricle with an ejection fraction of 28%.A repeat screening echocardiography of heart done after extubation showed improvement in Left Ventricular function. A repeat coagulation profile after correction showed PT of 15.3(control-10.6), aPTT of 22.4(control- 30.6), INR- 1.3. Serial blood gas values were within normal limits.

Treatment and outcome

Patient had persistent elevated blood pressure of 190/100 after 1 hour of admission. Patient was treated with Prazosin 0.5mg to counteract effect of initial catecholamine surge. Patient later developed hypotension with a blood pressure of 90/60mmHg after 3 hours of admission secondary to myocarditis. Patient was started on intravenous Dobutamine infusion and Noradrenaline infusions. The clinical features and investigations gave a picture that is consistent with severe systematic envenomation associated with scorpion sting than that are associated with a case of neurotoxic snake bite. On this note Anti scorpion anti-venom was transfused with an initial dose of 3 vials, followed by 1 vial every 3 hours to a total of 6 vials. Fresh frozen plasma was transfused to offset the coagulopathy. Patient's hemodynamic status showed significant improvement after 12 hours of admission and was extubated on the second day of admission. Post extubation patient revealed that he had been bitten by red coloured scorpion. One day after extubation patient developed parasthesia predominantly tingling sensation over right side of face and upper limb. A MRI brain was done which showed acute non hemorrhagic infarcts in b/l frontal, left parietal lobes, left thalamus and right cerebellar hemispheres- likely embolic etiology. Microbleeds in left frontoparietal lobes. Fig(a) and Fig(b). A lipid profile was done which normal values and bilateral carotid artery doppler was done which showed no hemodynamically significant occlusion or stenosis. A Neurology consultation was done and the patient was started on antiplatelet agents and discharged on day five.

Discussion

Scorpion venom consists of a mixture of various toxins which consists of neurotoxins which are responsible for inhibition of inactivation of the voltage gated sodium channel resulting in prolonged depolarisation of nerve cells. This is responsible for the excessive autonomic stimulation. Other components of the venom include hemolysins, phosphodieterases, histamine, serotonin and many other substances.[3-5]

Cerebrovascular incidents secondary to scorpion sting are rare which occur as either intracranial hemorrhages or ischemic infarcts. ischemic infarct occurring in a case of scorpion sting can be attributed to various pathologic mechanisms.[6,7]

Catecholamine induced myocarditis occurring as a result of excessive catecholamine

release from autonomic overstimulation can result in embolic stroke.[2,7] Cerebral vasospasm occurring secondary to catecholamine excess and other vasoactive substances like neuropeptide Y and endothelin-1 can result in occurrence of cerebral infarctions or aggravate cerebral ischemia.[2,5] The cardiac dysfunction and the resulting hemodynamic instability can result in decreased cerebral blood flow and may cause infarcts in watershed areas.[5,8] The toxins in the venom causing endothelial injury and the release of vasoactive substances resulting in disseminated intravascular coagulation can also be causations of cerebral ischemia.[5]

The presence of myocarditis and the presence of coagulopathy at presentation along with the presence of multiple infarcts and microbleeds points more towards a combination of embolic and disseminated intravascular coagulation as etiologies of infarcts in this case.

The difficulty in early diagnosis of unknown bites or stings as many cases occur in rural areas due to lack of awareness and accessibility to advanced healthcare facilities remains aschallenges which have to be tackled.

Antiscorpion venom administration maybe useful alongside prazosin in Indian red scorpion (Mesobuthus tamulus) stings[9]. Further studies need to be done regarding the effectiveness of anti scorpion venom.

Conclusion

- Cerebrovascular incidents secondary to scorpion sting are rare and can occur due to various mechanisms like cerebral vasospasm, disseminated intravascular coagulation, cardioembolic, arterial hypotension etc.
- Early diagnosis in cases of unknown bites or stings can help in giving specific treatment and better patient outcomes.

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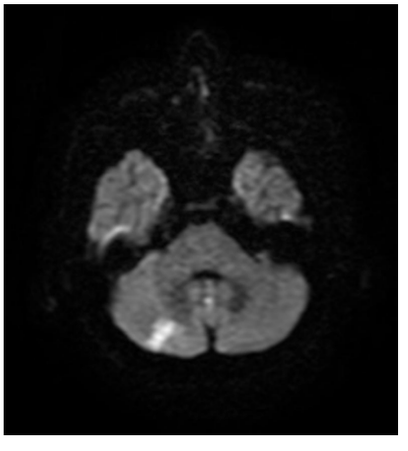

Fig. (a) - DWI showing infarct in right cerebellum.

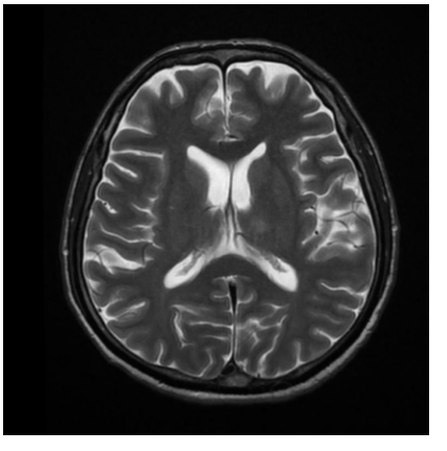

Fig. (b) - Hyperintensity in Thalamus seen on T2

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