**Hemorrhagic stroke following scorpion sting. A case report**

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**Abstract**

Scorpions inhabit many countries mainly undeveloped countries but it's present in developed nations where the weather is hot and wet. There are few cases describe in literature that refer to scorpion sting and stroke which the most common event is the ischemic stroke. In this, it's case related a hemorrhagic stroke after scorpion sting occurred in Sertãozinho, Brazil and a brief literature review.

**Key words:** Scorpion sting, stroke.

**Introduction**

Scorpion envenomation in Brazil represents a medical problem of great importance for population, especially urban population in some regions because of its high incidence and its potential induction of serious clinical pictures particularly among children and older persons. In Brazil the incidence of scorpion bite is 38,144 cases per year in 2007 according to the DATA SUS¹. The most common systemic manifestations are vomiting, profuse sweating, salivation, priapism, cold extremities, mydriasis, arterial hypertension, tachycardia and hypotension²,³. Critical cases which evolve with circulatory shock, seizures, heart failure, pulmonary edema and coma performed 29 cases in Brazil in 2006¹,³. Fluctuations in the blood pressure leading to cerebral hemorrhage and infarction are rare⁴. Central nervous system complications are rare comprising only 2% of all the complications⁵. There are few references to the production of brain infarcts and hemorrhage as a consequence of scorpion stings. Nagaraja et al., reported two cases⁶.

Clinical effects of the envenomation depend upon the species of scorpion and lethality and dose of venom injected at the time of sting⁷. It has been well established following T. serrulatus envenomation are due to the action of neurotransmitters released by the autonomic nervous system and adrenal medulla in the organism. The scorpion venom is a water-soluble, antigenic, complex mixture of several low molecular weight basic proteins, neurotoxins, nucleotides, amino acids, oligopeptides, nephrotoxin, cardiotoxins, hemolytic toxins, phosphodiesterase, phospholipase A, hyaluronidase, acetylcholineesterase, glycosaminoglycans, histamine, serotonin, 5-hydroxyptamine and proteins that inhibit protease, angiotensinase and succinate-dehydrogenase, ribonuclease, 5'-nucleotidase and others chemicals²,⁷. By opening sodium channels at presynaptic nerve terminals and inhibiting calcium dependent potassium channels, the neurotoxin, which is the most potent of the toxins, can be continuous, prolonged, repetitive firing of the somatic, sympathetic and parasympathetic neurons⁸. Since the advent of vasodilators prazosin, captopril, nifedipine, sodium nitroprusside, hydrazine, scorpion antivenom and intensive care management the fatality is dropped to less than 2-4%⁹.
Case report

A 54-year-old woman bitten by a yellow-colored scorpion - *T. serrulatus* - on her right foot while working in her house. Related mild local pain and paresis. On examination, she was hemodynamically stable, comfort breathing. Her pulse rate was 100 per minute and blood pressure 138 per 92 mmHg. Lung fields were clear. Auscultation revealed regular rhythmus without gallop. Realized analgesic medicines and the patient went home. After few hours she returned to the hospital due to a seizure and somnolent. Realized brain CT that shows spontaneous hemorrhagic stroke on frontal lobes (Figure 1). Carried to the intensive care unit where remained with continued assessment intracranial pressure and recovery. There wasn’t need for surgical treatment to the hemorrhagic stroke. She returned to home without neurological deficits after a few weeks in the hospital.

Discussion

Severe poisoning after a scorpion sting is characterized by important complications, mainly cardiac. Central nervous system complications are very rare and may present in either of two forms, both of which are associated with high mortality rates. Encephalopathy, the venom can be directly neurotoxic resulting in seizures and encephalopathy. Stroke: many mechanisms have been proposed to explain the occurrence of the strokes in patients with scorpion sting.

I. Rise in blood pressure due autonomic storm may rupture unprotected or diseased vessel resulting in hemorrhagic stroke.

II. Toxic myocarditis may precipitate arrhythmias and embolic stroke and associated blood coagulation changes including disseminated intravascular coagulation.

III. The venom is vasculotoxic and has led to damage endothelial cells and cause vasculitis.

IV. Catecholamine excess leads to severe vasoconstriction of the cerebral vessel.

Bilateral multiple cerebral infarcts are compatible with the resultant hypoperfusion and the most cases were in the parieto-occipital and fronto-parietal regions.

Conclusion

The scorpion envenomation in Brazil represents a medical problem of great importance, and the prevention and training for doctors have to be done. In endemic areas, appropriated clothing and shoes could prevent the sting and reduce the incidence. Besides, early hospitalization, administration of correct therapy and monitoring the victim in intensive care unit can save many life. The suspicion of neurological complications have to be considered and early diagnosis can offer a better prognosis to the patient.

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References

2. Bawaskar HS, Bawaskar PH. Scorpion Sting: Update. JAPI 2012; Jan; 60; 46-55.