CEREBROVASCULAR MANIFESTATIONS IN SCORPION STING: A CASE SERIES

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ABSTRACT

Cerebrovascular manifestations are uncommon presentations of scorpion sting in the Indian subcontinent. A prospective study was carried out on 50 patients with scorpion sting referred to the Government General Hospital during the period from April 2004 to March 2005. In all the patients, detailed history, physical examination with a specific neurological examination and routine biochemical testing and fundus examination were done. Computerized Tomography (CT) and Magnetic Resonance Imaging (MRI) were done in cases with neurological deficit. All these patients also underwent a complete hematological, rheumatologic and cardiovascular work-up for stroke. Cerebrovascular involvement was noted in four patients (8%). Hemorrhagic stroke was noted in two patients (4%) and thrombotic stroke was noted in two patients (4%). The mean time of presentation of neurological symptoms was 2 days. Stroke has been a common presentation in our series (8%). Contrary to world literature, there have been no reports of cranial nerve palsies or neuromuscular involvement in our series.

Key words: Disseminated intravascular coagulation, scorpion sting, stroke.

Cerebrovascular manifestations in scorpion sting

Scorpion sting is an acute life-threatening, time-limiting medical emergency of villagers. Among the 86 species of scorpions in India, Mesobuthus tamulus and Palamneus are of medical importance. Cardiovascular effects are particularly prominent following the stings by Indian red scorpion (Mesobuthus tamulus). Cerebrovascular manifestations are uncommon presentations of scorpion sting in the Indian subcontinent.

During the period from April 2004 to March 2005, a prospective study was done in patients with scorpion sting admitted to the Madras Medical College, a tertiary referral center. The diagnosis was based on positive history of scorpion sting, with scorpion being seen or killed by relatives or bystanders.

In all the patients, history, physical examination with a specific neurological examination and routine biochemical testing and fundus examination to specifically note the changes in the retinal vessels due to longstanding hypertension were done. Vitals were recorded on arrival and thereafter at one hourly interval. Electrocardiogram (ECG) was done to detect any changes due to scorpion sting induced myocarditis and to detect any evidence of left ventricular hypertrophy due to longstanding hypertension.

Out of the total of 50 patients with documented scorpion sting, 5 patients had neurological deficit on examination. But 1 patient was excluded because the neurological deficit was due to an old infarct in the internal capsule due to a thrombotic stroke sustained a year ago. The patient was excluded from the study. Focal neurological deficit was noted in 4 patients (8%). The commonest presentation of neurological deficit was hemiparesis, observed in 3 patients (6%). One patient presented with coma following the scorpion sting. All the 4 patients were males. Their mean age was 32 years (range from 18-35 years).

Hemorrhagic stroke was noted in 2 patients (4%) and thrombotic stroke was noted in 2 patients (4%). Among the patients with hemorrhagic stroke, 1 patient had a frontal intralobar hemorrhage, while 1 patient had hemorrhage in the putamen. Both the patients with thrombotic stroke had involvement of the middle cerebral artery (MCA) territory – one due to disseminated intravascular coagulation (DIC) and the other due to cerebral vasospasm. Patient with DIC producing a thrombotic stroke presented at 3 days after the scorpion sting, while patients with hemorrhagic stroke presented within 24 h of the scorpion sting. Patient with thrombotic stroke due to DIC had documented defibrination. The other patient with MCA territory infarct had an elevated anticardiolipin antibody titer in moderate titers (both IgG and IgM) and when repeated after 6 weeks, it became negative. All the 4 patients had a normal carotid doppler and a normal transthoracic echocardiogram with no evidence of left ventricular hypertrophy. All the patients with stroke had no evidence of myocarditis or pulmonary edema on clinical examination or echocardiogram. One patient with intralobar hemorrhage died on the second day of sting due to raised intracranial tension and coning. All other 3 patients did exceedingly well and recovered within a period of 1 month.

Prazosin was initiated in all the 4 patients with scorpion sting. Patient with frontal lobe hemorrhage was started on warfarin and anticoagulation therapy. He had a complete recovery with minimal residual deficits.

In the remaining 9 patients, a clinical diagnosis of scorpion sting was made. All these patients had a normal transthoracic echocardiogram and carotid doppler after 6 weeks, for all the patients. It was noted that all the patients who presented with focal neurological deficit showed a complete recovery with minimal residual deficits.

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intracerebral hemorrhage, who presented on the second day, had not been initiated with prazosin in the hospital from which he was referred with focal neurological deficit. The other 3 patients were referred on the first day and prazosin was started early in other cases. Patients with stroke, both thrombotic and hemorrhagic, were managed conservatively with prazosin and supportive measures.

**DISCUSSION**

Scorpion venoms are species-specific complex mixtures of short neurotoxic proteins. Alpha-receptors stimulation by the toxin results in hypertension, tachycardia, myocardial dysfunction, pulmonary edema. Raised angiotensin I levels have also been documented, which facilitates the sympathetic outflow through conversion to angiotensin II. The unopposed effects of alpha-receptors stimulation lead to myocarditis. Acute rise in blood pressure due to sympathetic stimulation, rupture of unprotected perforating arteries, intracerebral hemorrhage and cerebral infarction due to DIC and central respiratory failure are reported in scorpion stings. There have been a number of limitations in our study as vasospasm could not be proved by angiography. Protein C and S estimation was not done in thrombotic strokes in view of the fact that the deficiency of protein C and S usually produce venous infarcts rather than arterial infarcts, as in our series. Transesophageal echocardiogram was not done in our cases, which would have picked up thrombus in the heart missed by transthoracic echocardiogram. But it would be a highly unlikely event to expect thrombus in a patient with a well-contracting myocardium with no evidence of hypertrophy or dilatation of heart chambers.

**CONCLUSION**

Cerebrovascular manifestations were seen in 4 (8%) patients. Treatment with prazosin, if initiated early, may prevent many cerebrovascular manifestations of scorpion sting.

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**REFERENCES**