

SPECTRUM OF NEUROLOGICAL MANIFESTATIONS IN SCORPION STING

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ABSTRACT

Aim: To study clinical and radiological profile of scorpion sting.

Material and Methods: A retrospective study was carried out on 30 patients suffering from scorpion sting in our tertiary referral centre over a period of 15 months from June 2014 to August 2015. Detailed history, physical examination with a specific neurological examination and routine biochemical tests and fundus examination were done. Computerized Tomography (CT) head, and where required, Magnetic Resonance Imaging (MRI) was done in those having focal neurological deficit. All these patients also underwent a complete hematological, rheumatologic and cardiovascular work-up for stroke.

Result: Stroke was seen in six patients (20%). Hemorrhagic stroke was noted in four patients (13.33%) and thrombotic stroke in two patients (6.67%). The mean time of presentation of neurological symptoms was 2 days. Stroke has been the most common presentation in our cases (20%). Various other neurological manifestations in our study were psychosis, hemiparesis, isolated cranial nerve palsies. Such a variety of neurological manifestations has not been observed in any single study.

Conclusion: The scorpion envenomation in India represents a medical emergency, and the prevention and training for doctors have to be done. The suspicions of neurological complications have to be considered and an early and prompt diagnosis can offer a better prognosis to the patient.

KEYWORDS: Scorpion Sting, Stroke, Third Nerve Palsy, Magnetic Resonance Imaging

INTRODUCTION

Scorpion sting is a major public health problem especially in rural parts of India. They are usually found in warm climate throughout the country. They inhabit commonly the crevices of dwellings, underground burrows, under logs or debris, paddy husk, sugarcane fields, coconut and banana plantations. They are usually nocturnal, so most of the bites occur in night time. The common systemic manifestations of scorpion bite are vomiting, profuse sweating, salivation, priapism, cold extremities, mydriasis, arterial hypertension, tachycardia and hypotension [1, 2], Neurological and cerebrovascular manifestations of scorpion sting are common in southwest United States and Mexico [3], However, these are uncommon presentations (8%) of scorpion sting in the Indian subcontinent [4],

MATERIAL AND METHODS

During the period of 15 months, from June 2014 to August 2015 we included 30 patients of scorpion bite who presented to Sir Sundar Lal hospital, Banaras Hindu University, a tertiary referral centre in the North Eastern part of India.

The diagnosis was based on positive history of scorpion sting, with scorpion being seen or killed by relatives/patients. In all cases, a detailed history and physical examination were done. All patients were evaluated at the time of presentation, along with complete haematological work up in the form of complete blood count, peripheral smear, platelet count, fibrin degradation products, serum homocysteine, rheumatological work-up of rheumatoid factor, antinuclear antibody, lupus anticoagulant, anticardiolipin antibody (IgG and IgM) and cardiovascular work-up of lipid profile, transthoracic echocardiogram and carotid doppler. Those having focal neurological manifestation were evaluated, in addition with Computerized tomography (CT) and magnetic resonance imaging (MRI) of brain, when required. Detailed clinical profile of patients with neurological deficits has been shown below [Table 1]. Out of the six cases, the first one is interesting and hereby I am describing this case in detail. MRI brain was performed in the first case only because of diagnostic dilemma.

Case 1: A 30 year old gentleman presented to outdoor without any history of medical illness, and had got sting on left 2nd toe by black scorpion while working in the fields followed by severe local pain without oedema associated with headache, vomiting and generalized tonic clonic seizures 8-10 hours later. His younger brother also got sting at the same time by same scorpion, but had only history of local site pain and vomiting, without any neurological manifestation.

Examination

His blood pressure was 150/90 mm of Hg without any rash or signs of bleeding. Patient was delirious and only focal neurological deficit was right third nerve palsy [Figure 1]. Lung fields were clear and auscultation revealed normal sounds.

Investigation

CT head showed right parieto occipital haemorrhage with extension to subarachnoid space [Figure 2]. Bleeding Time, Clotting Time, Prothrombin Time, APTT, and platelet count was normal. Other routine blood chemistry like random blood sugar, LFT, RFT, Lipid profile was normal. Patient was investigated further to rule out other possible causes of stroke.

MRI brain was performed and it explained our clinical finding of cranial nerve palsy that was not demonstrated on CT scan. MRI brain revealed FLAIR hyper intensity at the site of the emergence of the right third cranial nerve from medial aspect of the right midbrain cerebral peduncle with mild edema of the right 3rd cranial nerve in the interpeduncular fossa as well [Figure 3, 4 and 5].

Patient was treated conservatively and he improved over a period of 10 days.

RESULTS

Out of the total 30 patients with documented scorpion sting, six patients had neurological deficit on examination. Focal neurological deficit was noted in 6 patients (20%). The commonest neurological presentation was hemiparesis, observed in 4 patients (13.33%). One patient presented with ataxia, altered sensorium and bilateral sixth nerve palsies who became deeply comatosed within 6 hours following the scorpion sting. She died on 4th day of admission. Four patients were males and 2 females. One female patient who had ischemic stroke, also found to have rheumatic heart disease during investigation. The mean age of patients was 32.67 years (range from 18-56 years). All cases had local burning pain and headache of various durations. Fifteen cases (50%) had history of recurrent vomiting. Hemorrhagic stroke was noted in 4 patients (13.33%) and ischemic stroke was seen in 2 patients (6.67%). Out of six, five patients developed hypertension

following scorpion sting.

None of them were known case of hypertension. Echocardiography detected one case of valvular heart disease without left atrial clot. Carotid Doppler study was normal in all cases. All patients were managed symptomatically with appropriate drugs like intravenous fluid, antiemetic, antihistaminic, no steroidal anti-inflammatory drugs (NSAIDS). Antiepileptic and prazosine were given to control seizure and hypertension. Out of six cases, 3(10%) patients had good recovery, one died of cerebellar bleed and other 2 showed poor recovery.

DISCUSSIONS

Scorpion sting is an acute life-threatening, medical emergency seen frequently in villagers [5]. Among the 86 species of scorpions in India, *Mesobuthus tamulus* and *Palamneus* are of medical importance[6], Cardiovascular effects are particularly prominent following the stings by Indian red scorpion (*Mesobuthus tumulus*)[7], Scorpion venom contains many chemicals which are water soluble, antigenic, complex low molecular weight basic proteins, nucleotides, amino acids, neurotoxins, nephrotoxins, hemolytic toxins, hemolytic toxins, phosphodiesterase, phospholipase A, hyalu-roinidase, acetylcholineesterase, glyco-saminoglycans, histamine, serotonin, 5-hydroxyptamine and proteins that inhibit protease, angiotensinase and succinate-dehydrogenase, ribonuclease, 5 - nucleotidase and others chemicals[1,7], Chemical reactions result into opening of presynaptic sodium channel and blockage of potassium channels at neuronal ends. This will lead to continuous and prolonged firing of somatic, sympathetic and parasympathetic neurons. Central nervous system complications are very rare and may present in either of two forms, both of which are associated with high mortality rates. 1) Encephalopathy: the venom can be directly neurotoxic resulting in seizures and encephalopathy. 2) Stroke: many mechanisms such as rise in blood pressure, toxic myocarditis, vasculotoxic damage to endothelium and vasoconstriction have been proposed to explain the occurrence of the strokes in patients with scorpion sting[8,9],

In contrast to other studies, in our series out of 30 , 18(60%) patients got sting in day time, during flood after heavy rains. In Most of the previous studies, patients presented with hemiparesis as neurological deficit, but in our study, various neurological manifestations were observed including local burning pain, stroke, isolated 3rd nerve palsy (Case 1) , hemiparesis, ataxia, recurrent seizures and cerebellar bleed leading to death. Though uncommon, neurological manifestations in the form of ophthalmoparesis can be seen with scorpion sting. Our study showed higher (20%) percentage of neurological manifestations in comparison to previous studies [3, 4], we presume that the cause of milder presentation of younger brother of patient in case 1, may be due to lesser amount of envenomation.

Conflict of Interest: None

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APPENDICES

Legends to Figure

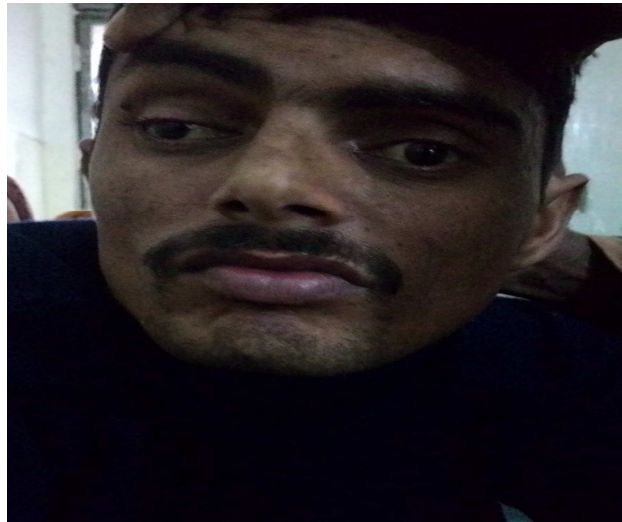


Figure 1: Showing Lateral Deviation of Right Eyeball along with Right Side Ptosis



Figure 2: Axial Section of CT Head showing Right Parieto Occipital Haemorrhage with Extension to Subarachnoid Space

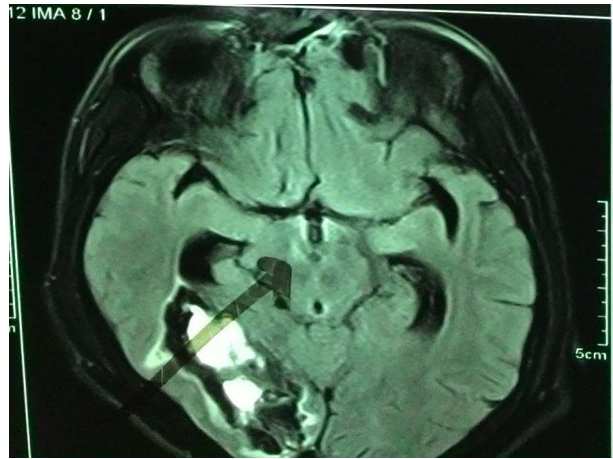


Figure 3: Axial Section of MRI Brain Revealed Flair Hyper Intensity at Site of the Emergence of the Right Cranial Nerve from Medial Aspect of the Right Midbrain Cerebral Peduncle

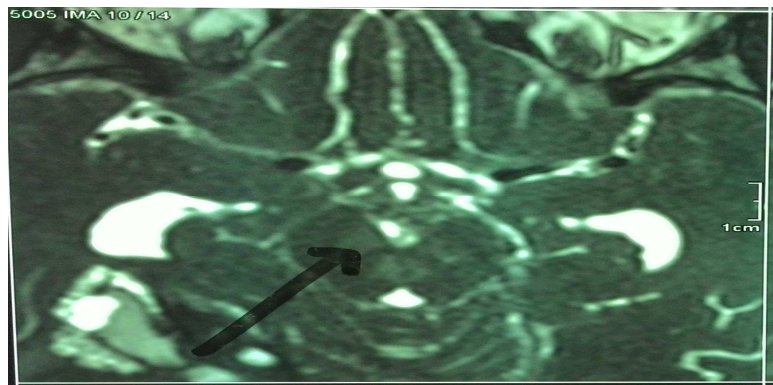


Figure 4: Axial



Figure 5: Sagittal Section of MRI Brain Revealed Flair Hyper Intensity with Mild Edema of the Right 3rd Cranial Nerve in the Interpeduncular Fossa

Table 1: Clinical Profile of Neurological Deficit Patients

SI No	Age (yrs)	Sex (M/F)	Hypertension	Neurological Deficit	Stroke(Ischemic /Hemorrhagic)	Lesion Site	Outcome
1.	30	M	Yes	3 rd Nerve palsy, Acute psychosis	Hemorrhagic	Rt Parieto-Occipital & midbrain	Good
2.	22	M	Yes	Left Hemiparesis	Hemorrhagic	Rt putamen	Poor
3.	42	F	Yes	Ataxia, B/L 6 th nerve palsy	Hemorrhagic	Cerebellum	Death
4.	56	M	Yes	Leg>Arm Rt HP	Ischemic	Left ACA	Good
5.	18	M	Yes	Left Faciobrachial	Hemorrhagic	Rt frontal	Good
6.	28	F	No	Rt HP	Ischemic	Left MCA	Poor

HP=Hemiparesis, RT=Right, Lt=Left, ACA=Anterior cerebral artery, MCA=Middle cerebral artery