Complete Ophthalmoplegia with Areflexia Following Snake Bite can Mimic Brain Death

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ABSTRACT
Ocular complications after snake bite are well reported. External ophthalmoplegia is an established association with neurotoxic envenomation, but, combination of internal and external ophthalmoplegia (complete ophthalmoplegia) can mimic brain death and pose a dilemma to the doctors treating such patients regarding continuation of therapy. We here report a case of a 8 years boy who was playing and something has pierced in his right hand. He then developed pain, swelling in his right hand and forearm and weakness of limbs and subsequently other systemic symptoms and signs. On examination two clean puncture wounds were identified on his right index finger. A provisional diagnosis of snake bite with severe envenomation was made and anti snake venom was started. Over a period of 3-4 hours his weakness progressed and became areflexic. Subsequently the patient developed internal and external ophthalmoplegia and loss of other brain stem reflexes mimicking brain death.

Keywords: Neurotoxicity, Ophthalmoplegia

1. CASE REPORT
A 8 years old boy who was playing in the evening after rain and taking his ball out of stack of woods, felt that something has pierced in his right hand and he had pain and swelling in his hand after that. The pain and swelling started increasing gradually towards forearm and the child complained of difficulty in breathing about 2 hours later. He was brought to hospital then. On asking about the mode of injury there was no history suggestive of a snake bite/insect bite. On examination we could see two clean puncture marks (no bleeding) on the right index finger. There was a massive swelling on right hand and forearm with no blistering or necrosis of the swollen limb. The child was drowsy, not obeying to verbal commands and but was reacting to pain. His pulse rate was 80/min, BP-100/60 mmHg SpO2 – 60% on oxygen by face mask and breathing was shallow. The child had bilateral ptosis and power was decreased (grade 2-3) in all four limbs. The deep tendon reflexes were sluggish with extensor plantars. Endotracheal intubation was done and he was ventilated on synchronized intermittent mandatory ventilation as some respiratory effort was observed.

From the clinical examination finding, provisional diagnosis of snake bite with severe envenomation was made and Polyvalent anti snake venom therapy was started. Total of 100 ml antivenom was given. Over a period of 3-4 hours, condition of the patient worsened. He was comatose, was not responding to painful stimuli, motor weakness further worsened and he became areflexic. His pupils were fixed dilated and not reacting to light. The patient was now on full ventilator support as he had no spontaneous respiratory effort. Ventilation was continued despite findings suggestive of brain stem dysfunction. After about 30 hours of ventilation he showed a flickering movement of his
fingers and toes. The paralysis started improving distally first then proximally. After 5 days of ventilation, extubation was done and the patient was shifted to Pediatric Intensive Care Unit (PICU). He had mid-dilated and very sluggishly reacting pupils. The patient was kept in PICU for 3 more days till further improvement and then discharge was planned. At the time of discharge from hospital the swelling in the upper limb was decreased significantly. The power in the lower limbs was improved to grade 4 and grade 5 in upper limbs. Pupils were still mid-dilated and reacting sluggishly to light.

2. DISCUSSION

Snake bites often go unreported since reporting is not mandatory in many regions of the world(1). In 1992 Hati et al. has found that only 22.14% victims of snakebite went to hospitals(2). Though no clear cut data is available due to poor reporting system and poor maintenance of hospital records in India, 35,000-50,000 people die every year in this country due to snake bite(3). Snake bites are more common after rains, after floods and at night(4). Venomous snakes are classified into two important families, elapidae and vipersidae. Elapidae include cobra, krait, coral snakes and sea snakes. Vipersidae family include typical vipers and the pit vipers. Elapids have significant neurotoxicity. Following an elapid bite, paralysis is first detectable a ptosis and external ophtalmoplegia appearing as early as 15 minutes. Sometimes onset may be delayed for 10 hours or more. Later on the face, palate, tongue, vocal cords, neck muscles and muscles of deglutition are paralysed. Airway obstruction or paralysis of intercostal muscles and diaphragm cause respiratory failure. Neurotoxic effects are completely reversible either acutely in response to antivenom or anticholinesterases or may wear off spontaneously in 1 to 7 days completely(5). Paralysis involves the proximal muscles first and then the distal muscles and recovery occurs in the reverse order(6). Snake venoms contain a complex mixture of proteins, enzymes, and various other substances with toxic and lethal properties. α-Neurotoxins are a group of neurotoxic snake peptides present in the venom of snakes in the families Elapidae that cause paralysis. These α-neurotoxins attack the Nicotinic acetylcholine receptors of cholinergic neurons. They mimic the shape of the acetylcholine molecule and therefore fit into the receptors, they block the Acetylcholine flow and feeling of numbness and paralysis(7). The internal ophthalmoplegia is attributed to autonomic dysfunction(8). On reviewing the literature very few cases with similar findings have been reported(9,10). Progressive paralysis along with opthalmic manifestations (external ophthalmoplegia) of neurotoxin is common in victims of snake bite. However, this case highlights the occurrence of complete ophthalmoplegia (internal and external ophthalmoplegia) along with areflexia which mimics brain death in many ways and to consider for withdrawal of ventilatory support at this time would be disastrous. In such cases other confirmatory tests of brain death like electroencephalography, four-vessel cerebral angiography, transcranial Doppler ultrasonography or radionuclide imaging should be performed(11).

3. CONCLUSION

The clinicians should be aware that fixed and dilated pupil in a case of neurotoxic snake bite is a sign of envenoming and not a sign of brain death. Aggressive supportive treatment should be continued, and the patient may recover completely.

REFERENCES
