

Clinical and Demographic Profile of Snake Envenomation in Himachal Pradesh, India

We describe profile of 60 children [mean (SD) age, 9.5 (3.8) y] presenting to the department of Pediatrics with snake envenomation. Neurotoxic bites were predominant (53%) and required mean (SD) 21.5 (9.29) antsnake venom vials, while children with neurohemotoxic features required mean (SD) 31.2 (10.8) vials to improve. Duration of hospital stay was median (SD) 4.0 (2.71) days. The commonest complication was respiratory dysfunction; mortality rate was 13.3%.

Keywords: Snakebite, Outcome, Pediatric.

India has the highest number of deaths due to snake bite in the world [1,2]. A few reliable incidence data are available from rural tropics [3] but not from all regions of India [4-8].

Retrospective (27 patients over 4 years) and prospective (33 patients over 2 years) data on pediatric snakebite was collected in the Department of Pediatrics at Dr RPGMC Tanda, Kangra in Himachal Pradesh. During this period (January 2008 to December 2013), 71 children upto 16 years of age with snake bite were admitted, 60 of these were enrolled. Definitions used included: Bite to needle time: the time lapsed before administration of antsnake venom; Hemotoxicity: Bleeding from mucocutaneous sites, systemic bleeding, intravascular hemolysis, or deranged coagulation profile; Neuro-paralytic syndrome: Sensory or motor paralysis in the form of paresthesias, taste and smell abnormalities, ptosis, cranial nerve palsy, general flaccidity, or respiratory paralysis; and Severe envenomation (marked local response, severe systemic findings and significant alteration in laboratory findings) [4]. Data regarding demographic profile and symptomatology was collected and analyzed with SPSS 17 trial version.

Assessment showed severe grade of bite injury. Median (SD) age of the victims was 9.5 (3.8) years. The male to female ratio was 1.04 :1. The peak incidence of bite was during the months of July to September. Clinical profile is given in **Table I**.

Neuroparalytic features were seen in 32 (53.3%) children while 21 (35.0%) showed hemotoxic manifestations. Seven (11.6 %) had features of neurohemotoxicity. Only 3% cases reached the hospital within 1 hour of bite, 45.4% cases took 1-6 hours while 52% patients presented after 6 hours of bite. The mean dose of ASV was 210 ml (range 50-450 mL). Allergic reactions to ASV were noted in 17 (28.3%) cases.

Anaphylaxis was seen in 3 (5%). Very poor pre-referral management was observed with only 20% victims getting adequate treatment before being referred.

The mortality rate was 13.3%. Mortality in neurotoxic group (7/32) was more than neurovasculotoxic (1/7) and hemotoxic group (0/21). All children died with multiorgan dysfunction. The severity grade increased as the bite to needle time increased. Patients who received ASV 6 hours after the bite required more aggressive therapy like mechanical ventilation, and inotropes for hypotension. The duration of hospital stay in survival group was median 4.0 (2.71) days.

Both neurotoxic and haemotoxic bites were seen in children in this hilly area. Delayed presentation to hospital was seen in 93.9 % cases which is in agreement with other studies [5,6]. The delay was due to unrecognized night time bites, absence of fang marks, poor transport facility and visit to *tantriks* and *Nag mandirs*. Number of patients requiring ventilation (41.6%) was similar to that seen in adult studies [7,8].

The mean dose of ASV falls on the higher range for ASV dosage. The maximum dose advocated for treatment of neuroparalytic envenomation by Theakston, *et al.* [8] is 300 ml. As per National treatment protocol 2007, there is no evidence to show that low dose strategies have any validity in India. Children are usually more severely affected because of their smaller volume relative to venom dose. Mortality in our study (13%) was comparable to Shankar, *et al.* [9].

TABLE I CLINICAL PROFILE OF SNAKE ENVENOMATION

Clinical feature	n (%)
Vomiting	48 (80.0)
Abdominal pain	41 (68.3)
Ptosis	32 (65.0)
Respiratory failure	25 (41.6)
Hematuria	17 (28.3)
Hypotension	17 (28.3)
Cellulitis	15 (25.0)
Hypoxic ischemic encephalopathy	9 (15.0)
Aspiration pneumonia	8 (13.3)
Spontaneous bleeding	7 (11.6)
Intravascular hemolysis	6 (10.0)
Hemoglobinuria	5 (8.3)
Acute renal failure	4 (6.6)
Pulmonary hemorrhage	2 (3.3)
Compartment syndrome	1 (1.6)

The importance of immediate specific treatment, and hence the need to strengthen our peripheral health centres is paramount to reduce mortality due to snakebite. Ready availability and appropriate use of antsnake venom, close monitoring of patients, and timely institution of ventilatory support help in reducing the mortality [10].

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