Clinical Evidences of Italian Viper Venom Neurotoxicity: 11-year experience of Pavia Poison Control Centre

D Lonati, A Giampreti, VM Petrolini, S Vecchio, M Aloise, F Chiara, D Flachi, L Manzo, CA Locatelli

Poison Control Centre and National Toxicology Information Centre, Toxicology Unit, IRCCS Maugeri Foundation and University of Pavia (Italy)

Background: Peripheral neurotoxic effects (PNE) involve mostly cranial nerves and can be related to the pre- or postsynaptic toxicity of phospholipases-A2 (PLA2) that causes neuromuscular paralysis. Pre-synaptic PLA2 activity in Italian envenomation in Italy.

Objective: To study neurotoxic effects after viper envenomation in Italy.

Methods: All human cases of snakebite referred to PCC presenting PNE from Jan 2001 to Dec 2011 were included. Cases were assessed for: time from bite to PCC evaluation, GSS (2), onset/duration of clinical manifestations, severity/time course of local, non-neurological and neurological effects, antidotic treatment and outcome. Patients aged less than 14 years were included in pediatric group (PedG).

Results: 24 patients were included (age 3-75 ys). The mean interval time of PCC evaluation from snakebite was 10.80±19.93 hours. GSS at ED-admission was 0 (1 case), 1 (10 cases) and 2 (13 cases). All patients showed local signs: 41.6% minor, 58.4% extensive swelling and necrosis. The main systemic non-neurological effects were: vomiting (86.7%), diarrhea (66.7%), abdominal discomfort (53.3%) and hypotension (20%). PNE were: accommodation troubles and diplopia (100%), ptosis (91.7%), ophthalmoplegia (58.3%), dyspnea (20.8%), drowsiness (16.6%), cranial muscle weakness (12.5%), dyspnea (4.2%). Antidote was intravenously administered in 19 (79.2%) patients (Table 1). Picture 1 shows the clinical manifestations in a pediatric patient of our case series.

PNE were the unique systemic manifestation in 9 cases; in 4 cases they were associated with only mild local swelling. In 10 untreated AdG are detailed in the grey area.

Table 1. Clinical manifestations and grading in pediatric patients (PedG) and adult patients (AdG). All PedG were treated with antidote. Data related to untreated AdG are detailed in the grey area.

<table>
<thead>
<tr>
<th>Local signs (swelling)</th>
<th>neurotoxic</th>
<th>systemic non-neurotoxic</th>
</tr>
</thead>
<tbody>
<tr>
<td>M,3</td>
<td>mild</td>
<td>mild</td>
</tr>
<tr>
<td>M,4</td>
<td>moderate</td>
<td>moderate</td>
</tr>
<tr>
<td>M,5</td>
<td>severe</td>
<td>severe</td>
</tr>
</tbody>
</table>

Table 2. Modified Grading Severity Score (GSS) for peripheral neurotoxic effects after Italian viper bite.

Picture 1. (male, 6 ys; patient n.3 in Table 1) with mild local oedema (30 minutes after the bite), vomiting and diarrhea (2 hours after the bite); local effects worsened in extensive swelling of the lower limb at 10 hours after the bite (A, B). PNE appeared 12 hours after the bite (C). He was successfully treated with antivenom (1 vial/10 ml of European Viper Venom Antiserum) 3 hours after the appearance of ptosis. The PNE recovered 9 hours after the antidote administration and the complete recovery was registered 24 hours after the bite (D, E).

Conclusions: PNE may appear late (11 hours after the bite in 58.3% of cases), in contrast with the data reported in French medical literature (3). PNE has been reversible in all cases and may be the unique systemic manifestation of envenomation. PNE are shorter in treated group. The antidotic treatment of patients considered as GSS 2 only for PNE (with mild local effects) may not be necessary (Table 2). Variable factors such as different amount of venom injected, concentration of PLA2 component and individual susceptibility may explain the less percentage of patients presenting neurotoxic effects.