Anti-snake Venom (ASV) Intradermal Skin Test, a Common Clinical Practice in the Primary Health Care Setting in Tribal Block of Dahanu, Maharashtra, India

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Sir,

Snakebite envenomation is a neglected public health problem affecting farmers, hunters, labourers, snake rescuers, shepherds and migrating population in India as well as other tropical and sub-tropical countries. As per the Million Death Study, annually > 45,000 deaths were due to snakebites in India, however the actual burden may be higher as most of the patients in rural India are attended by the traditional healers. Currently, the only specific antidote to the toxins in snake venom is hyperimmunoglobulin from an immunized animal with an appropriate venom. Therefore, timely administration of anti-snake venom (ASV) is recommended treatment for snakebite envenomation and ASV has been included in the WHO Model List of Essential Medicines as well as National Essential Medicines List of India acknowledging its role in a primary health-care system. We present our observations based on the study conducted during January 2013 to July 2016 evaluating the usage of ASV intradermal skin test for snake bite envenomation and unknown bites managed at two Sub District Hospitals (SDHs) Dahanu and Kasa in Palghar District of Maharashtra State in India.

The study was approved by the Institutional Ethics Committee of ICMR-NIRRH and Director of Public Health Department, Government of Maharashtra. The data on ASV usage was captured by pretested and validated retrospective data collection form. The hospital case records of the snakebite envenomation and unknown bites with documented use of ASV from SDH Dahanu and SDH Kasa during the period of January 2013 to July 2016 were included in the study. Case records with incomplete or inadequate information about ASV were excluded from the analysis. The snakebite envenomation was either confirmed on clinical signs or documented history of snakebite recorded in the hospital case records.

The data analysis from two SDHs showed that a total of 2076 (93%) out of 2230 case records had documented information about ASV treatment during the study period. Out of 2076 cases, 947 (45.6%) were snakebite and 1129 (54.3%) were unknown bite cases respectively. There were 339 (67.5%) cases of snakebite and 163 (32.5%) cases of unknown bite in SDH Dahanu as compared to 608 (38.6%) snakebite and 966 (61.4%) unknown bite cases in SDH Kasa. The data was further categorized into direct ASV dosage, ASV intradermal skin test alone and ASV with skin test dose (Table 1). The usage of ASV intradermal skin test in treating patients with unknown bite was significantly higher as compared to snakebite cases (p<0.00001). ASV intradermal skin test dose was administered to 1393 cases irrespective of the snake bite envenomation or unknown bites leading to wastage of ASV.

Several national and international guidelines on snakebite recommended that no intradermal ASV skin testing should be done due to the following reasons. The skin hypersensitivity testing is non-predictive as ASV reactions are mediated by direct activation of the complement system and not mediated by IgE. Intradermal skin testing may delay treatment and waste time when the patient needs ASV, and it may pre-sensitize the patient leading to more severe reaction when a large amount of ASV is administered. In spite of this, Indian ASV manufacturers continue to recommend intra dermal skin sensitivity test in every patient prior to administration of ASV regardless of clinical history leading to shortage of ASV in Maharashtra and throughout India. Additionally, there was a lack of awareness and training on management of snakebite envenomation in Dahanu block resulting in unnecessary use of ASV for the intradermal skin test.

Therefore, the evidence generated from the present study on irrational usage of intradermal ASV skin test in public health care system in Dahanu block is very crucial for the doctors and policymakers in low and middle income countries including India for prevention of ASV wastage and also to avoid unnecessary delay in ASV administration as snakebite envenomation is a medical emergency.

Based on our observations, we suggest that Medical Officers and other healthcare providers in the public health care system in India should be trained on priority basis for management of snakebite as per the Standard Treatment Guidelines (STG, 2016), developed by Government of India.

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Table 1: Analysis of anti-snake venom (ASV) for snake bite and unknown bite in Dahanu block of Palghar District in Maharashtra State, India

<table>
<thead>
<tr>
<th>ASV parameters</th>
<th>Snakebite cases (n = 947)</th>
<th>Unknown bite cases (n = 1129)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASV treatment dose</td>
<td>197 (20.8%)</td>
<td>51 (4.5%)</td>
<td>&lt;0.00001</td>
</tr>
<tr>
<td>ASV intradermal skin test dose</td>
<td>440 (46.5%)</td>
<td>953 (84.4%)</td>
<td>&lt;0.00001</td>
</tr>
<tr>
<td>ASV treatment dose with intradermal skin test</td>
<td>310 (32.7%)</td>
<td>125 (11.1%)</td>
<td>&lt;0.00001</td>
</tr>
</tbody>
</table>
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Contributions

RG, SM: Conceptualization, design, planning and implementation of study. RG, IKC, NS, SB: Data collection, interpretation of data, data analysis, manuscript preparation. PB, AY: contributed to organize the study and clinical inputs and review of the manuscript. All authors reviewed the manuscript.

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