

Applicability of an Immunochromatographic Rapid Cobra Test in Patients with Suspected Cobra Bite in Bangladesh

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Abstract

Objectives: Bangladesh has a high burden of snakebites with annual episode of ~700000 victims and more than 6000 deaths per year. Neurotoxic envenoming by Cobra (*Naja naja*, *Naja Kauthia*) and Krait are the principal cause of snakebite mortality in Bangladesh. One difficult aspect in the management is the diagnosis of the biting species. There is no affordable and field level test available against any snake species in Bangladesh. Neurotoxicity and local swelling (tissue necrosis) are considered to be the presenting syndrome of envenomation by Cobra (*Naja*). There are several serological procedures available for detection of snake venom. A rapid diagnostic kit, Cobra Rapid Test[®] for Taiwan cobra (*Naja atra*) with high sensitivity, high specificity and easy to perform was developed in Taiwan. This kit is based on lateral-flow immunochromatographic assay technique (LFA) for Cobra venom. The objective of the study was to detect the applicability of Cobra Rapid Test[®] in patients with suspected Cobra bite in Bangladesh.

Methods: Snakebite victims with neurotoxicity and local swelling in the Chittagong Medical College Hospital in Bangladesh were enrolled in this study. Blood samples were taken on admission before administration of antivenom, clinical history was taken and clinical findings were noted. Where patients were admitted with specimens, these were identified by experts and sample was tested immediately.

Results: A total of 35 patients were enrolled over a period of 13 months. Twenty of them were male and fifteen female. Age ranged from 9 years to 75 years. Among the patients' samples, 19 tested positive with Cobra Rapid Test[®]. Among the three victims who came with the offending snake (all *Naja kauthia*) only one tested positive. All the patients were treated with polyvalent antivenom with a favorable outcome.

In the absence of any diagnostic test a syndromic approach was used in this study to identify patients suspected to be bitten by Cobra. The three patients presenting the offending snake were confirmed bitten by Cobra. The poor performance of the Cobra Rapid Test[®] could be due to venom's antigenic variation among species.

Conclusions: Rapid test developed against another species cannot be used reliably to diagnose snake bites. Species-specific diagnostic test must be developed to assure timely availability of appropriate patient care at the point-of-use.