A Descriptive study of the Clinical Profile of Snake Envenomation in a Tertiary Care Center in Tamil Nadu and the Diagnostic and Prognostic Utility of Serum Phospholipase A2 in Various Envenomation Syndromes

George Abraham, Rajesh R Valmiki, Parvathi Leelavinodhan, M.A.Yogapriya, Anand Zachariah

ABSTRACT

Aims and objectives: The aim of the study was to describe the clinical profile of snake envenomation presenting to a tertiary care hospital in South India. The clinical profile included description of various envenomation syndromes, temporal profile and complications of snake bite patients. It also aimed to assess the utility of serum PLA2 in diagnosis and prognosis in snake envenomation.

Materials and methods: A descriptive single center study done in patients above the age of 15 who present to Emergency Department of our hospital with history of snake bite/unknown bite with typical envenomation syndromes. Detailed clinical assessment was done by the principal investigator to assess the envenomation syndromes at admission and on a daily basis till the discharge and venous samples were collected for PLA2 analysis on a daily basis for 5 days. Samples were processed for PLA2 activity from snake bite patients with envenomation, without envenomation and normal healthy controls for comparison. The outcome was assessed by the occurrence of various
envenomation syndromes and their duration of persistence after the administration of ASV, complications of renal injury, venom induced consumptive coagulopathy, requirement of product support, dialysis, mechanical ventilation and mortality
Identification of dead snakes and correlation of envenomation syndrome and biting species was performed.

**Results and discussion:** Among 167 patients with systemic envenomation the most common syndrome was Russell’s viper envenomation syndrome (Haemotoxicity with AKI/and or neurotoxicity) accounting for 61%, (n=102) of the patients. The occurrence of neurotoxicity in Russell’s viper envenomation syndrome was very high (85.3%, n=87). But the severity of neurotoxicity in Russell’s viper envenomation syndrome was less when compared to Elapidae bite syndrome (pure neurotoxicity). The incidence of AKI in Russell’s viper envenomation syndrome was 56.9% (n=58). One in three patients with Russell’s viper envenomation required haemodialysis 33.3% (n=34). 4.90% (n=5) of the patients with Russell’s viper envenomation syndrome succumbed and mortality was exclusively associated with Russell’s viper envenomation. Median ASV requirement was higher in Viperidae bites when compared to Elapidae bites (p=0.002). Dead snakes were identified in 13 cases and syndrome species correlations were made.
PLA2 levels were measured in 30 normal controls, 100 patients with snake envenomation and 64 snake bite patients with no envenomation. The median PLA2 activity at admission was 74.02 μmol/min/ml (40.2-180.6) for patients with systemic envenomation, 80.93 μmol/min/ml (40.9-151.6) in patients with snake bite without systemic envenomation and 62.10 μmol/min/ml (41.9 -91.1) in normal healthy controls. PLA2 levels were elevated in both envenomated and non envenomated snake bite patients and there was no significant difference (p=0.886). PLA2 was elevated in viper bite syndromes compared to elapidae syndromes (p=0.001). PLA2 levels showed greater elevation in more severe viper bite syndromes requiring blood transfusion (p=0.009) and dialysis (p=0.047). PLA2 levels declined with time (p=0.008).

**Conclusion**- Russell’s viper envenomation syndrome is the most common cause of systemic envenomation in Tamil Nadu which is associated with high rates of neurotoxicity, muscle injury and AKI, need for blood transfusion and dialysis and significant mortality.

PLA2 activity is not a useful test to diagnose snake bite patients with systemic envenomation although it may have a role in distinguishing between Viper and Elapidae bites and assessing prognosis of Viper bites.

**Key words**- Snake envenomation, Russell’s viper, haemotoxicity, Phospholipase A2