

Thrombotic microangiopathy and acute kidney injury following Sri Lankan *Daboia russelii* and *Hypnale* species envenoming

[Eranga S Wijewickrama¹](#), [Lalindra V Gooneratne²](#), [Ariarane Gnanathasan¹](#), [Indika Gawarammana³](#), [Mangala Gunatilake⁴](#), [Geoffrey K Isbister](#)

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Abstract

Context: Thrombotic microangiopathy (TMA) resulting in acute kidney injury (AKI) is an important complication of venomous snakebites. We aimed to describe TMA secondary to Russell's viper (*Daboia russelii*) and hump-nosed viper (*Hypnale* spp.) bites and assess the effect of different treatments.

Materials and methods: We undertook a prospective observational study of patients with AKI secondary to snakebite over a two-year period. Data recorded included: demographic details, clinical and laboratory features, treatment, complications and outcomes, until hospital discharge and at three months post-discharge. TMA was defined as the development of microangiopathic hemolytic anemia and thrombocytopenia along with AKI. Treatment with therapeutic plasma exchange (TPE; also known as plasmapheresis) and/or fresh frozen plasma (FFP) was determined by the treating clinician. Antivenom was given to all patients with evidence of systemic envenoming following Russell's viper bites.

Results: Fifty-nine patients were included in the analysis. Thirty-three (56%) were males and median age was 56 years. Forty-five (76%) developed TMA while a further 11 and two developed isolated thrombocytopenia and microangiopathic hemolytic anemia, respectively. Presence of TMA was associated with increased dialysis requirements (5 vs. 3) and longer hospital stay (18 vs. 12 days). Of the patients with TMA, nine received TPE with or without FFP infusions. The use of TPE was not associated with improved outcomes in patients with TMA based on requirement for blood transfusion, recovery of thrombocytopenia, requirement of dialysis and duration of hospital stay. Patients who did not receive TPE had better renal function at three months compared to patients who received this treatment.

Conclusion: Presence of TMA in patients with *Daboia* and *Hypnale* bites was associated with a more prolonged course of AKI. Patients with TMA who were treated with TPE did not have improved early or late outcomes compared to patients who were not treated with TPE.

Keywords: Russell's viper; Thrombotic microangiopathy; acute kidney injury; hump-nosed viper; therapeutic plasma exchange.