OP – 34

Acute kidney injury and thrombotic microangiopathy following *Daboia* and *Hypnale* envenomation: A descriptive study from Sri Lanka

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Objective: Russell's viper (*Daboia* spp,) and Hump-nosed viper (*Hypnale* spp.) envenomation account for almost all the cases of acute kidney injury (AKI) following snakebites in Sri Lanka. Thrombotic microangiopathy (TMA) has been observed in association with AKI following bites by both of these vipers. The purpose of this study was to assess the prevalence of TMA in patients admitted with AKI following snakebites to a tertiary care hospital, to describe the treatment modalities used and the outcomes.

Methods: This is an ongoing prospective observational study carried out at the National Hospital of Sri Lanka (NHSL). All consenting adults admitted to the hospital with AKI (based on KDIGO criteria) following snakebites were included. TMA was diagnosed in individuals who had thrombocytopenia (platelet count <100,000/ml) and microangiopathic haemolytic anaemia (MAHA). The diagnosis of MAHA was made by the haematologist based on the amount of red cell fragmentation on the blood film. Treatment was determined by the admitting physician.

Results: Forty five patients were included from May 2016 to August 2017. Twenty five (55.55%) were males, and the median age was 56 (Range: 31-84). Nine were bitten by Russell's viper (RV), twenty three by Hump-nosed viper (HNV) and the biting snake was unknown in the remainder. The median time to admission to NHSL post-bite was two days (Range: 2 hours - 31 days). All nine RV and seven unknown snakebites received antivenom. Thirty three patients had platelet counts below 100,000/ml (median 71,000). All the patients developed anaemia (median haemoglobin 6.70 g/dl in females, 7.10 g/dl in males). Thirty seven patients had MAHA and twenty eight (RV 5, HNV 16 and Unknown 7) patients had TMA. Eighteen received fresh frozen plasma (FFP) and/or plasmapheresis. The median length of stay in hospital until discharged, transferred back or death was 17 days (HNV 21 d, RV 17 d, unknown snake 10 d). Thirteen patients were still dialysis dependent on discharge or transfer back to their referral hospital. There was no significant association between the use of plasmapheresis+/- FFP and the recovery of thrombocytopenia or AKI.

Conclusion: Most patients who developed AKI following HNV and RV bites also had TMA suggesting an association between the two. No standard protocol appears to exist locally in the management of TMA in viper envenomation. In the limited number of patients studied the use of FFP and plasmapheresis does not appear to have a significant impact on the outcome of TMA.