

MYOTOXICITY IN AUSTRALIAN SNAKE ENVENOMING (ASP-23)

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Objectives: Systemic myotoxicity from Australian snake envenomation is important and sometimes fatal. This study investigated the occurrence and characterised myotoxicity in Australian snake envenomation including response to antivenom.

Methods: Envenomed patients with myotoxicity were identified from the Australian Snakebite Project (ASP). All patients that developed myalgia and/or elevated creatine kinase (CK) after a snakebite were included. Snake type was confirmed by expert identification or venom specific enzyme immunoassay. Severe myotoxicity was defined as peak CK > 10,000 U/L and patients with abnormal creatinines as acute kidney injury (AKI). Diagnostic performance of early CK in all cases, activated partial thromboplastin time (aPTT) in black snake cases and international normalised ratio (INR) in cases with venom induced consumptive coagulopathy, to detect patients with severe myotoxicity, was assessed by area under the receiver operator characteristic curve (AUC-ROC).

Results: There were 108 snakebite patients with myotoxicity; median age 37y (1-87y) and 82 males. Snakes involved were tiger snake (34), mulga snake (16), red bellied black snake (16), taipan (10), rough scaled snake (9), sea snake (4), collett's snake (3) and death adder (2); unknown in 14. 61 patients had bite site myalgia and 33 developed generalised myalgia. Trismus occurred in ten. Major local bite site/regional necrosis occurred in six patients. 94 patients developed non-specific systemic symptoms; median onset time was 0.5h (0.5-2h). AKI occurred in 13 patients, six requiring dialysis. Two patients died from complications of rhabdomyolysis and AKI. Antivenom was given to 88 patients a median of 4.8h (0.5-80 h) post-bite. Median length of stay was 2.8days (0.6-29d), 5.3days (0.7-29) and 13 days (3.4-45d) in uncomplicated myotoxicity, severe myotoxicity and patients with AKI, respectively. Median peak CK measured was 4625U/L (458-785100U/L). Median time to peak CK was 33h (6-337h). Median time to first abnormal CK (>500 U/L) was 13h (0.8-393h). A CK performed 0-6h had an AUC-ROC of 0.62 (95%CI:0.51-0.75), at 6-12h of 0.69 (0.58-0.81) and at 20-28h of 0.92 (0.85-0.99). An aPTT at 0-6h had an AUC-ROC of 0.60 (95%CI:0.39-0.74) and at 6-12h of 0.68 (0.53-0.84). An INR at 0-6h had an AUC-ROC of 0.59 (95%CI:0.38-0.79) and at 6-12h of 0.63 (0.46-0.79).

Conclusions: Myotoxicity causes significant morbidity (AKI and tissue injury) and mortality. Increased CK concentrations lag behind non-specific systemic symptoms. Early CK and coagulation studies are not good predictors of severe myotoxicity, and are too late to guide antivenom therapy. Other biomarkers of envenomation or myotoxicity need to be investigated