Presented at the ACMT Annual Scientific Meeting 2016 – Huntington Beach, CA

Published in J Med Toxicol 2016,12:19-20

49. Snakebite Neurotoxicity: a Retrospective Review of Patients Reported to the ToxIC North American Snakebite Registry

EC Moore[1], R Vohra[2], B Wolk[3], AM Ruha[1], On Behalf of the ToxIC NASBR
[1] Banner - University Medical Center, Phoenix, AZ, USA, [2] UCSF Fresno Medical Education Program, Fresno, CA, USA, [3] Loma Linda University School of Medicine, Loma Linda, CA, USA

Background: Neurotoxicity is a well-described but uncommon effect of North American snake envenomation (NASE). Reports are generally limited to small case series and may represent more severe cases rather than the complete spectrum of neurotoxicity. Further investigation is warranted.

Research Question: What are the characteristics of neurotoxicity following NASE?

Methods: Data reported to the ToxIC North American Snakebite registry (NASBR) between January 1, 2013 and October 22, 2015 were reviewed. Inclusion criterion was any neurotoxic effect observed after snakebite. Patient demographics, snake species, and clinical findings were collected. Microsoft Excel and descriptive statistics were used.

Results: Four hundred thirty-three cases representing 10 US states were reviewed. Twenty-four cases with neurotoxicity were reported in Arizona, California, Colorado, and Texas. Mean age was 41 years (2–78). Nineteen (79 %) were male. Thirteen (54 %) were upper extremity and 11 (46 %) lower extremity bites. Snakes included the following: 20 (83 %) North American rattlesnakes (2 Grand Canyon, 1 sidewinder, 1 southern pacific, 16 unknown species), 1 Texas coral snake, 1 cottonmouth, 1 copperhead, 1 non-native South American rattlesnake. Neurotoxic symptoms included the following: 11 (46 %) extremity paresthesias, 11 (46 %) fasciculations/ myokymia, 7 (29 %) perioral paresthesias, 2 (8 %) objective weakness, 1 (4 %) seizure without history of seizure disorder. Texas coral snake and copperhead neurotoxicity involved extremity paresthesias and cottonmouth involved paresthesias and fasciculations/myokymia. No patients required intubation.

Discussion: Reports of neurotoxicity after NASE typically describe fasciculations or myokymia, and in many, respiratory failure. In this cohort, fasciculations were common but respiratory failure did not occur, suggesting it is a very rare event with NASE neurotoxicity. Seizure has been reported previously, though in association with respiratory arrest. NASE neurotoxicity has been most associated with coral snakes and Mojave, timber and southern pacific rattlesnakes. Copperheads and cottonmouths (both Agkistrodon spp.) have not previously been reported to produce neurotoxicity. This NASBR neurotoxic cohort included Grand Canyon and Sidewinder rattlesnake, and Akgistrodon envenomations. Limitations include retrospective nature of review as well no standardized method of snake species identification.

Conclusions: Fasciculations and paresthesias were the most commonly reported neurotoxic symptoms after NASE in this cohort. Neurotoxicity may be associated with Agkistrodon envenomation.