078. Interspecies Differences in Rattlesnake Envenomations in the Western United States Reported to the North American Snakebite Registry

Christopher F Dion¹,², Richard Gerkin¹, Christopher Hoyte³, Brian Wolk⁴, Sharan Campleman⁵, Anne-Michelle Ruha¹,²; On Behalf of the ToxIC Snakebite Study Group

¹University of Arizona College of Medicine – Phoenix, Phoenix, AZ. ²Banner – University Medicine Center Phoenix, Phoenix, AZ. ³University of Colorado School of Medicine, Aurora, CO. ⁴Loma Linda University Medical Center, Loma Linda, CA. ⁵American College of Medical Toxicology, Phoenix, AZ.

Background: Rattlesnake envenomations produce cytotoxic, hemotoxic, neurotoxic, and systemic effects. While some effects have been associated with particular species of rattlesnake, such as neurotoxicity following Mohave envenomation, comparison of clinical effects between species has not been studied.

Hypothesis: There are significant interspecies variations in clinical effects from rattlesnake envenomation.

Methods: This is a cohort study of patients reported to the North American Snakebite Registry with envenomation by a positively identified species of rattlesnake in the western United States. Snakes were “western” if the range was entirely west of the Mississippi River. Only species with greater than 15 cases were included to allow for statistical comparisons using Pearson’s chi-squared test.

Results: 173 cases met inclusion criteria. Five western species had over 15 cases identified and included 76 Crotalus atrox, 31 C. viridis, 29 C. lutosus, 20 C. scutulatus, and 17 C. helleri. Statistically significant differences were seen between species for the following: C. scutulatus was associated with more hypotension than C. lutosus (25% vs. 0%, p=.008); C. atrox had more hypofibrinogenemia than C. scutulatus (25% vs. 0%) and C. viridis (3.4%) (p= 0.002). C. atrox was also associated with more bleeding and necrosis than C. viridus (23.7% vs. 3.2%, p=.001; and 18.4% vs. 0%, p= 0.003; respectively); C. helleri was associated with more neurotoxicity than C. atrox (52.9% vs. 5.3%, p <0.001).

Conclusion: Comparison of clinical effects following envenomation by western species of rattlesnakes reported to the North American Snakebite Registry demonstrated statistically significant differences in rates of hypotension, hypofibrinogenemia, bleeding, necrosis, and neurotoxicity between species.