Presented at the ACMT Annual Scientific Meeting 2023 – San Diego, CA

Published in J Med Toxicol 2023;19(2):130-131.

142. Systemic Toxicity after Rattlesnake Envenomation in Patients Using Angiotensin Converting Enzyme Inhibitors in the North American Snakebite Registry

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Background: Rattlesnake venom may increase bradykinin levels via both bradykinin-potentiating peptides which bind bradykinin receptors or inhibit angiotensin converting enzyme (ACE), and kallikrein-like enzymes, which increase bradykinin formation from kininogens. Use of ACE inhibitors (ACEI) also raises bradykinin levels.

Research Question: Is there an association between ACEI use and systemic venom effects following rattlesnake envenomation (RSE)?

Methods: This was a cohort study utilizing Toxicology Investigators Consortium (ToxIC) North American Snakebite Registry (NASBR) data. Patients with RSE between 1/1/2013-12/31/2021 reporting ACEI use (ACEI group) were compared to patients without ACEI use (No ACEI group). Primary outcome parameters were systemic venom effects (hypotension, vomiting, diarrhea, angioedema, and/or respiratory failure). Secondary outcomes included length of stay and total number of antivenom vials administered. Chi-Square, Fisher Exact, and Mann Whitney U Tests were used. Logistic regression models were computed for systemic toxicity; Poisson regression models were constructed for number of antivenom vials. Analyses were conducted in R 4.1.2.

Results: 43 (5.3%) patients were in the ACEI group and 775 (94.7%) in the No ACEI group. Groups were similar regarding gender, state where bite occurred, bite location, time to antivenom, and acute antivenom reactions. ACEI patients had more hypotension (18.6% vs 6.5%; p= .008) and more diarrhea (11.6% vs 2.1%; p= 0.003). There were no differences in overall systemic toxicity between ACEI usage and no ACEI usage. Total antivenom vials (both Fab and Fab2) were similar between groups, however ACEI use was associated with more Fab vials compared to no ACEI use (Est: 0.17; 95% CI: 0.45, 0.77) when adjusting for covariates. Lengths of stay were similar between groups.

Conclusion: In the NASBR, patients who use ACEIs are more likely to experience hypotension and/or diarrhea after RSE than are patients who do not. ACEI usage was also associated with receiving a higher number of Fab vials.