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007. Frequency of Critical Care Interventions by Mechanism of Action in Pediatric Anti-Epileptic Drug Overdose

Andrew B Troger^{1,2}, Michael S Toce^{1,2}; On behalf of the Toxicology Investigators Consortium (ToxIC)

¹*Boston Children's Hospital, Boston, MA.* ²*Harvard Medical Toxicology, Boston, MA.*

Background: Anti-epileptic drugs (AEDs) are commonly prescribed to pediatric patients for both primary seizure prophylaxis as well as psychiatric indications. AED overdoses are associated with a wide range of toxicity, which is dependent on the mechanism of action (MOA) of the specific drug. Hypothesis: Pediatric exposures to AEDs with sodium-channel blockade require critical care interventions (CCIs) more frequently than exposures to other AEDs.

Methods: We performed a cross-sectional analysis of single-agent pediatric (0-19 years) AED exposures reported to the Toxicologic Investigators Consortium (ToxIC) database between 2010-2020. AEDs were sorted by MOA and compared to a composite measure of CCIs. This measure included vasopressors, endotracheal intubation, renal replacement therapy, gastric lavage, whole bowel irrigation, and hemodynamic measures such as mechanical cardiac pacing or extracorporeal circulatory support. Descriptive statistics were used to describe the cohort. Chi-squared test was used to compare drug-classes and CCIs.

Results: 497 AED exposures were identified, with 41 (8.2%) requiring CCIs. The majority of exposures (n = 298; 60.0%) were female. The median exposures per year was 49 (IQR 33-56.5), with a peak incidence of 71 exposures in 2014. Lamotrigine (n = 101), clonazepam (n = 86), and carbamazepine (n = 84) were the most common exposures; lamotrigine (14/101) and carbamazepine (14/84) required the most CCIs. AEDs with sodium-channel blockade (n = 240) had the highest proportion (33/240; 13.8%) of CCIs, and were more likely to require CCIs compared to agents with all other primary mechanisms of action (8/257, 3.1%), $\chi^2 (1) = 18.6, p < 0.001$. Valproic acid (n = 68) accounted for the largest proportion (5/8; 62.5%) of CCIs among non-sodium channel blocking agents.

Conclusion: Exposures to AEDs with sodium-channel blockade carry a higher probability of requiring CCIs than exposures to agents with no sodium-channel blockade. Clinicians should consider these risks in the determination of monitoring recommendations and disposition for patients poisoned with AEDs.