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163. Comparing clinical features of benzodiazepine overdoses: a review of the Toxicology Investigators Consortium registry

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Background: Benzodiazepines are sedative-hypnotic medications that are commonly encountered by medical toxicologists. They elicit their effects through activity at the benzodiazepine receptor and are typically amenable to competitive reversal through administration of flumazenil. There are very few studies comparing clinical characteristics of toxicity between different agents within the benzodiazepine class. The objective of this study is to compare the frequencies of adverse effects and use of treatments following ingestion of various benzodiazepines.

Methods: This is a retrospective review of all available single-substance benzodiazepine ingestions entered into the Toxicology Investigators Consortium Registry from January 2010 through December 2020. Frequencies are reported as percentages and statistical significance was determined using the Chi-Square or Fisher's exact test, where appropriate.

Results: From the available registry data, there were 887 singles-ubstance benzodiazepine ingestions. Of those 887 cases, the most commonly ingested benzodiazepines were alprazolam (n = 303, 34.2%), clonazepam (n = 281, 31.7%), and lorazepam (n = 148, 16.7%). All other benzodiazepines were considered together as "other" (n = 155, 17.5%). Alprazolam ingestions were associated with significantly higher rates of central nervous system (CNS) depression than other benzodiazepine ingestions (71.9% vs 59.1%, $p < 0.001$). Patients with lorazepam ingestions were treated significantly more often with flumazenil than other ingestions (18.2% vs 10.2%, $p < 0.01$). Those who received "other" benzodiazepines were associated with lower rates of CNS depression (54.8% vs 65.3%, $p < 0.05$) but higher rates of intubation (12.3% vs 6.8%, $p < 0.05$).

Discussion: Benzodiazepine ingestion can result in CNS and respiratory depression, need for endotracheal intubation, and rarely bradycardia and hypotension. Our data show that alprazolam ingestions result in significantly higher rates of CNS depression than other benzodiazepine ingestions, which is consistent with previous literature on alprazolam. Our data also demonstrated that flumazenil was given more often following lorazepam ingestions when compared to other benzodiazepine ingestions.

Conclusion: Alprazolam toxicity results in higher rates of CNS depression in overdose compared to other benzodiazepines. Toxicologists may be more likely to treat lorazepam overdoses with flumazenil compared to other benzodiazepine ingestions. While the reason for this discrepancy is unclear, future studies may help to further characterize differences in presentation and treatment of benzodiazepine ingestions.