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120. Comparing clinical features of benzodiazepine and z-drug overdoses: a review of the Toxicology Investigators Consortium registry

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Background: Benzodiazepines and z-drugs (eszopiclone, zaleplon, zolpidem, and zopiclone) are two pharmacologically similar sedative-hypnotic classes encountered by medical toxicologists. Both drug classes produce similar clinical effects via interaction with the benzodiazepine receptor site and are reversible with flumazenil. Little data has been published directly comparing these medications and their clinical effects in toxicity. The objective of this study is to compare frequencies of commonly seen adverse effects and use of treatment strategies between drug classes.

Methods: This is a retrospective review of all available data regarding single-drug ingestions of benzodiazepines and z-drugs 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-squared test.

Results: From the available registry data, there were 829 singledrug ingestions of benzodiazepines and 140 single-drug ingestions of z-drugs. Of the 140 cases of z-drugs identified, the majority were zolpidem ingestions (89%). Of the 829 cases of benzodiazepine ingestions, the most commonly ingested drugs were alprazolam (36.5%), clonazepam (33.9%), and lorazepam (17.9%). When comparing clinical features of benzodiazepine ingestions to z-drug ingestions, there was no significant difference between rates of central nervous system (CNS) depression (64.9% vs 68.6%; p = NS), respiratory depression (9.0% vs 8.4%; p = NS), endotracheal intubation (7.7% vs 9.3%; p = NS), bradycardia (2.5% vs 1.4%; p = NS), or hypotension (2.7% vs 5%; p = NS). Our data did demonstrate a significant difference in rates of administration of flumazenil between benzodiazepine ingestions and z-drug ingestions (11.7% vs 5.0%; $p < 0.05$).

Discussion: Both benzodiazepines and z-drugs can result in CNS and respiratory depression, need for endotracheal intubation, and, rarely, bradycardia and hypotension. Our data suggests that the frequencies of these outcomes are similar in single-drug ingestions of both types of drugs. While flumazenil has been shown to reverse toxicity of both medication classes, our data indicate its use is significantly less frequent in z-drug overdoses compared to benzodiazepines, even in the setting of similar rates of CNS depression and intubation.

Conclusion: Clinical effect profiles of benzodiazepines and zdrugs are similar. Despite this, flumazenil may be underutilized in z-drug overdoses compared to benzodiazepine overdoses.