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099. Review of Recent Herbicide Exposures

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Background: Herbicides are a relatively uncommon exposure and encompass a breadth of agents with varying toxicities.

Research Question: What are the agents of exposure, demographics, and clinical characteristics of patients exposed to herbicides?

Methods: This is a retrospective review of all single-substance herbicide exposures reported to the Toxicology Investigators Consortium Registry from January 2010 through May 2021.

Results: Fifty-seven single-substance herbicide exposures were identified. Of these, 71.9% were male. Exposures were intentional in 22.8% of cases. The most common agents identified were glyphosate (33.3%), Agent Orange/chlorophenoxy herbicides (19.3%), paraquat (12.3%), and dicamba (8.8%). Inhalational (33.3%), oral (29.8%), and dermal (12.2%) routes of exposure were most common. The nature of the exposure was most often acute (57.9%), with 22.8% being chronic and 19.3% unknown/not reported. More than half of the encounters occurred in the outpatient setting (50.8%). Clinical outcomes were generally good, with death occurring in only three cases (5.2%); however, all three cases were intentional self-harm exposures to paraquat. Nine patients (15%) had a major vital sign abnormality reported, which included hypotension (n = 5), tachycardia (n = 2), hypertension (n = 1), and bradycardia (n = 1). The most common pharmacologic support provided was vasopressors, steroids, and benzodiazepines, each of which was utilized in four patients (7.0%). Among non-pharmacologic support, 14.0% received IV fluid resuscitation and 8.8% were intubated or required ventilatory management. Activated charcoal was used in three patients (5.3%). Extracorporeal removal via hemodialysis or continuous renal replacement was used in four patients (7.0%). N-acetylcysteine was administered in two paraquat exposures, both of which were fatal.

Conclusion: Single-agent herbicide exposures were relatively well-tolerated with the exception of paraquat, which was responsible for all deaths from single-agent herbicide exposure. More research may be warranted to further characterize herbicide exposures and outcomes.