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191. Hydroxocobalamin Use in Non-Cyanide Poisoned Patients: A Retrospective Analysis of the ToxIC Core Registry

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Background: Hydroxocobalamin is an established antidote for cyanide poisoning reportedly administered in patients presenting with refractory vasodilatory shock, in part due to its scavenging of nitric oxide and hydrogen sulfide. Despite growing interest, limited clinical evidence exists to guide its use in non-cyanogenic exposures.

Hypothesis or Research Question: In what context are non-cyanide poisoned patients at centers with medical toxicologists receiving therapeutic hydroxocobalamin?

Methods: This was an analysis of data from the Toxicology Investigators Consortium (ToxIC) Core Registry who received therapeutic hydroxocobalamin from September 2010 to January 2025. Exclusion criteria included: patients with no documentation of administered vasopressors, exposures consistent with cyanide or smoke-related poisoning (e.g., carbon monoxide, sodium nitroprusside, acetonitrile, and sodium azide), and if the bedside medical toxicologist deemed the signs and symptoms were uncertain/unlikely to be due to a toxic exposure. Demographics, substances, co-administered therapies, vasopressor utilization, and clinical outcomes were summarized.

Results: Among 151 hydroxocobalamin-treated cases identified, 11 met inclusion criteria (63%) were female (12/19) with a median age of 38 years. All patients received vasopressors; 16/19 (84%) had a documented systolic blood pressure under 80 mmHg. Two (11%) exposures involved ethanol alone. Of the remaining 17 cases, eight (47%) were amphetamine ingestions and nine (53%) were poly-ingestions. Amlodipine was the most frequent exposure, present in nine (53%) nonethanol cases; four (50%) single-substance exposures were amlodipine ingestions. Other common exposures included angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers (six patients) and non-dihydropyridine calcium channel antagonists (three patients). Adjunctive therapies were commonly: two received atropine, seven received calcium, 10 received high-dose insulin euglycemia therapy, six received intra-lipid emulsion, and 10 received methylene blue. Many patients received multiple vasopressors: angiotensin II (37%), epinephrine (74%), dobutamine (5%), norepinephrine (89%), phenylephrine (42%), vasopressin (74%). One case documented therapeutic use of vasopressors but not specific agents. Mortality was 47%, and in one case clinical outcome was unknown.

Conclusion: Hydroxocobalamin is being used in a subset of hypotensive poisoned patients in the ToxIC Core Registry, most commonly in severe calcium channel blocker toxicity. These patients reported high mortality. Limitations of this study include potential misclassification bias and missing data for those given hydroxocobalamin, and the inability to account for nationwide hydroxocobalamin shortages.

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