IOWA POISON CONTROL CENTER

Poison HOTLINE

1-800-222-1222

January 2023

Did you know ……

Less than 0.5% of human exposure cases in which the IPCC was consulted for management of a suspected poisoning resulted in a fatal outcome.

Of the 33 fatalities reported to the IPCC in 2022, 40% involved antidepressants. Other categories of substances include opioids, sedatives, antipsychotics, cardiovascular drugs, acetaminophen, and methamphetamine. Alcohol was involved in >25% of the cases. Two-thirds of the cases had more than one substance (range 1-9 substances).

Thirty fatalities involved adults (≥ 20 years) and 3 cases involved ≤ 19 years of age. Nearly half of the cases were suspected suicides.

In case of a poison emergency, call **1-800-222-1222**. IPCC medical toxicologists are available 24/7 to consult with health care professionals on complex cases as needed.

Amlodipine

Calcium channel blockers (CCB) can be separated into 2 different categories: dihydropyridines and non-dihydropyridines. Amlodipine (Norvasc) is a dihydropyridine and therefore has more prominent peripheral effects such as vascular smooth muscle relaxation and arterial vasodilation compared to more central effects on cardiomyocytes of non-dihydropyridines effects. In overdose, amlodipine is expected to cause peripheral vasodilation resulting in significant hypotension which can be refractory to the usual treatments.

Amlodipine prescribing as well as toxicity are on the rise. The general approach to treating CCB (and beta-blocker) toxicity includes consideration of high dose vasopressors and high dose insulin euglycemic therapy (HIET). Emerging data questions the utility of HIET in the specific setting of amlodipine overdose.

HIET is supported in the literature as a core tool in treating CCB and beta-blocker overdoses. It is thought to help through enhancement of cardiac metabolism and cardiac contractility. So why would it not work as well in an amlodipine overdose? The answer likely comes down to a mismatch between the pharmacodynamic effects of amlodipine (which peripherally vasodilates) and HIET (which centrally increases cardiac contractility).

This information can be applied to treating amlodipine toxicity by incorporating basic bedside cardiac ultrasound to determine cardiac contractility. Patients who have reasonable cardiac contractility but remain hypotensive from amlodipine toxicity are unlikely to benefit from HIET. While HIET would not directly be harmful, patient's may be better served by a focus on treatment with vasopressors (norepinephrine, epinephrine, vasopressin, etc.). Essentially, they have adequate cardiac contractility, but there is not enough blood returning to the heart due to the excessive vasodilation.

It is still unclear if this incongruence can be extrapolated to other dihydropyridines such as felodipine, nifedipine, and nicardipine but should be at least considered in other dihydropyridine CCB exposures. Regardless of the type or severity of exposure, consultation with the IPCC is recommended. Our specially trained nurses, pharmacists, and medical toxicologists are available 24/7/365 and can be reached at 1-800-222-1222.

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