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249. Presence of mitragynine and 7-hydroxymitragynine in ED patients with confirmed opioid overdose

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Background: Mitragynine (MIT) and 7-hydroxymitragynine (7-OH-MIT) are naturally occurring alkaloids that are of increasing public health concern due to their opioid properties and widespread commercial availability. We aimed to determine the prevalence of confirmed MIT and 7-OH-MIT exposure in adult emergency department (ED) patients with confirmed acute opioid overdose, and to describe clinical outcomes in this subset of patients.

Methods: This was a subgroup analysis of a prospective multicenter cohort study enrolling adult ED patients presenting with suspected opioid overdose at 10 U.S. sites between September 2020 and April 2025. Patients with waste serum specimens, drawn as part of routine clinical care, had toxicology analysis performed using liquid chromatography quadrupole time-of-flight mass spectrometry (using a library of over 1,200 substances). This subgroup analysis considered only patients with confirmed opioid use prior to the current overdose. The primary outcome was the proportion of patients with detectable serum MIT or 7-OH-MIT. Secondary outcomes were measures of overdose severity including in-hospital cardiac arrest, intubation, and ICU admission. A multivariable regression analysis investigated whether confirmed MIT exposure was a predictor of severe clinical outcomes (ICU admission, in-hospital cardiac arrest, intubation, and/or naloxone infusion), after adjusting for demographic information (age, gender, geographic region).

Results: Opioids (prescription or illicit) were detected in the serum of 2,118 patients (8,741 patients were screened). Of the 2,118 patients with opioid overdose, 33 (1.6%, 95% CI 1.1% to 2.2%) tested positive for MIT and 2 (0.1%, 95% CI 0.0% to 0.3%) tested positive for 7-OH-MIT. Amongst patients who tested positive for MIT 93.9% (95% CI% 80.4% to 98.3%) also tested positive for fentanyl, fentanyl analogues or prescription opioids. Notably, none of the patients who tested positive for MIT

required intubation, experienced in-hospital cardiac arrest, or expired during their hospital encounter. Twenty-eight (85%) of these patients received naloxone. Six patients (18%) who tested positive for MIT required ICU admission, 5 (15%) required hospital floor admission, and 2 (6%) required ED observation. The remainder (61%) were discharged from the ED. MIT was not associated with severe secondary outcomes (aOR 1.5, 95% CI 0.7 to 3.0).

Conclusions: The prevalence of MIT in patients presenting to EDs with confirmed opioid overdose was extremely low. When detected, MIT is frequently seen as a co-exposure to other, more potent, opioids. While MIT was not associated with severe outcomes, 7-OH-MIT patients had the most severe clinical outcomes in the subgroup.