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241. Shifting landscapes of synthetic cathinones: regional variations in opioid contamination

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Background: Synthetic cathinones are known adulterants of illicit opioids, included for their stimulant and hallucinogenic effects. Cathinones pose significant risk due to their evolving nature in response to drug scheduling, with new substances being unpredictably incorporated into the illicit drug supply. Data on the prevalence and patterns of cathinones as adulterants is sparce. We aimed to characterize the geographic spread of cathinones in a national cohort of ED patients with confirmed opioid overdose.

Methods: The Toxicology Investigators Consortium (ToxIC) Fentalog Study is an ongoing prospective observational study initiated in 2020 across 19 emergency departments at 10 institutions in the United States. Waste blood from patients with quadrupole time-of-flight mass spectrometry was performed. Chart review data including demographics, substance use history, clinical treatment, and length of stay were obtained.

Results: Among 2,480 patients included in the Fentalog Study between 2020 and 2025, 19 (0.77%) of patients had confirmed exposure to cathinones. Patients were primarily male (n = 15; 79%) between 18 and 65 years old (n = 18; 95%). Cathinones included eutylone (n = 7, 37%), N-cyclohexyl butaylone (n = 7; 37%), pentylone (n = 3; 16%), dimethylpentylone (n = 1; 5%), and alpha-PHiP/alpha-PiHP (n = 1; 5%). Of those testing positive for eutylone, 5 of 7 patients were in the Southern region of the United States while 2 of 7 were in the Midwest region. However, N-cyclohexyl butylone was found only in the Northeast and Western regions. Using the chi-squared test with Yates correction, there was no significant difference in cardiovascular effects such as tachycardia or hypertension (> 160 mmHg) between cathinone and non-cathinone or cathinone and stimulant exposed non-cathinone patients. Additionally, there was no significant difference between the cathinone and non-cathinone groups in rates of ventilation, admission, ICU admission, or doses of naloxone administered.

Conclusions: While synthetic cathinone co-exposures in confirmed opioid overdose was uncommon, specific cathinone exposure appears to follow a regional pattern, with higher prevalence of eutylone in the Midwestern and Southern United States and N-cylcohexyl butylone in the Northeastern and Western regions. There were no significant differences in major outcomes between cathinone and non-cathinone exposed patients.