Detection of Eutylone in Chronic Pain and Behavioral Health Populations

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Overview

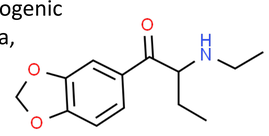
Purpose:
- Evaluate the prevalence of eutylone in a chronic pain and/or behavioral health clinical setting and better characterize its potential impact on patient care

Methods:
- Liquid-liquid extraction followed by LC-MS/MS

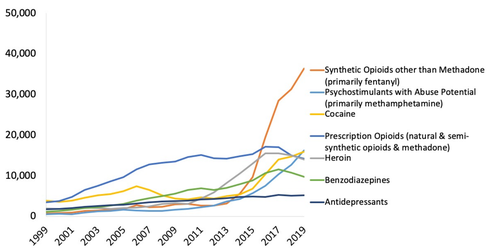
Results:
- Seventy-two (72) positive eutylone results were reported from samples that were evaluated from July 2020 through early April 2021 received across 43 states

Introduction

- Eutylone was first identified on the DEA Emerging Threat Report in 2019
- Classified as a synthetic cathinone, a group of Novel Psychoactive Substances (NPS) that act as central nervous system (CNS) stimulants[1]
- Quickly has become the most detected cathinone derivative[2]
- Structural analog of N-ethyl pentylone and butylone, containing ethyl groups at the α-carbon and amine positions[2]
- Also known as bk-EBDB or N-Ethylbutylone[1]
- May be present in cases that are suspected of being Ecstasy, "Molly" and/or Methylenedioxymethamphetamine[2]
- Synthetic stimulants, such as eutylone have stimulant and entactogenic properties – euphoria, mental stimulation, intensification of sensory senses, empathy connection[1]



National Drug-Involved Overdose Deaths*, Number Among All Ages, 1999-2019



*Includes deaths with underlying causes of unintentional drug poisoning (X40–X44), suicide drug poisoning (X60–X64), homicide drug poisoning (X85), or drug poisoning of undetermined intent (Y10–Y14), as coded in the International Classification of Diseases, 10th Revision. Source: Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2019 on CDC WONDER Online Database, released 12/2020.

https://www.drugabuse.gov/drug-topics/trends-statistics/overdose-death-rates

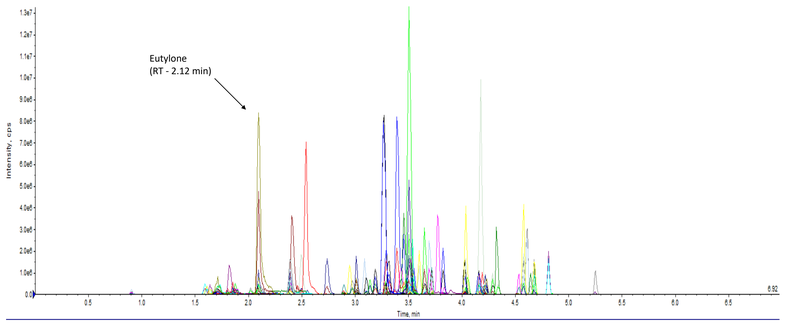
Methods

Sample preparation
- Hydrolysis with liquid-liquid extraction followed by evaporation and reconstitution

Chromatographic separation
- LC-MS/MS: reverse phase, Restek Raptor Biphenyl (100x3mm, 2.7µm) column

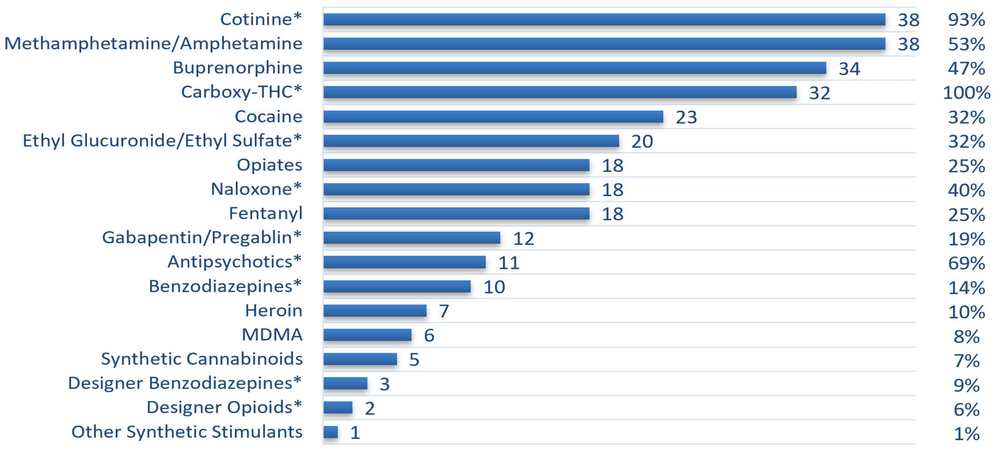
Instrumentation
- MS/MS: SCIEX API 4000™

Data Interpretation Software
- MS/MS: SCIEX MultiQuant™ 2.1.2



Results

Figure 1. Co-Positive Analytes (% Positive)



*Sample positivity based on what was ordered and tested; Not all samples may have been tested for all classes. Percent positivity based on number of samples tested.

Figure 2. Age Distribution

Average: 39 Min: 19
Median: 37 Max: 68

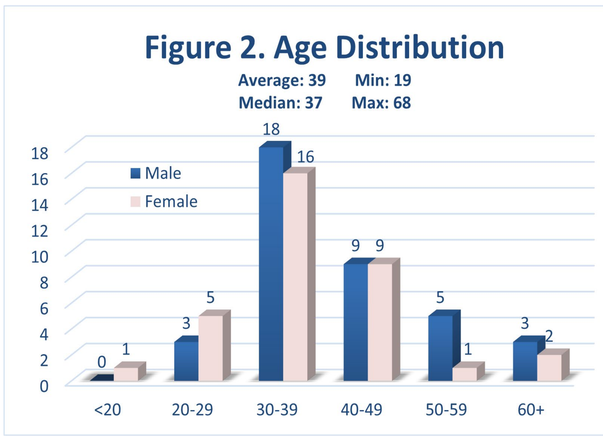
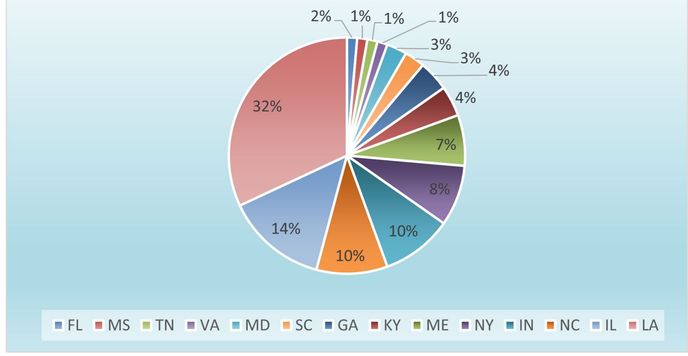


Figure 3. Positive Eutylone Samples by State



Discussion

Data Analysis
- Eutylone was present in 72 samples out of 123,304 requested synthetic stimulant tests, which is a 0.06% positivity rate
- Although this positivity rate does not seem high, eutylone is one of the most prevalent synthetic stimulants that appear in forensic toxicology and seized drug casework
- Detected in patients from a variety of age groups with no gender bias
- Detection is not limited to a specific geographical area, which shows eutylone use is widespread

Co-Positivity with other CNS Stimulants
- Eutylone use with other CNS stimulants can cause an increased risk of cardiovascular events since both affect the central nervous system, causing increased heart and respiratory rate

Co-Positivity with Alcohol
- Co-ingestion with alcohol can mask the effects of alcohol intoxication, which may lead to excessive drinking or alcohol poisoning
- Alcohol use may negatively impact clinical success for patients undergoing substance abuse treatment for stimulants

Co-Positivity with Opioids
- Stimulants and synthetic stimulants can mask the effects of opioids
- The combination of eutylone with opioids can increase the risk of respiratory failure, arrhythmias, or stroke

Conclusions
- Eutylone is an analyte of concern for clinicians in chronic pain and behavioral health settings
- Eutylone can be present with other prescription drugs, illicit drugs, or alcohol
- Testing of NPS compounds helps provide a valuable tool for clinicians to support effective patient treatment plans
- Overdose deaths from synthetic opioids, psychostimulants and cocaine have been on the rise and co-ingestion with NPS drugs can increase this risk factor

References

[1] Paillet-Loilier, M, et al. Emerging drugs of abuse: current perspectives on substituted cathinones. *Substance Abuse and Rehabilitation*. **2014**, 5, 3-52.

[2] Krotulski, A.J, et al. Eutylone Intoxication – An Emerging Synthetic Stimulant in Forensic Investigations. *J Analytical Tox*. **2021**, 45, 8-20.

[3]National Institute on Drug Abuse. **2021**. https://www.drugabuse.gov/drug-topics/trends-statistics/overdose-death-rates