

Evan S Schwarz MD¹, Kim Aldy MD², Alison Meyn², MD, Sharan Campleman², Shao Li², Alex Krotulski³,

Barry Logan^{3,4}, Paul Wax MD², Jeffrey Brent MD⁵, Alex F Manini MD⁶, On behalf of the Toxic Fentanyl Study Group

¹Washington University School of Medicine, St. Louis, Missouri; ²American College of Medical Toxicology, Phoenix, AZ; ³Center for Forensic Science Research and Education at the Fredric Rieders Family Foundation, Willow Grove, PA; ⁴Toxicology Department, NMS Labs, PA; ⁵University of Colorado School of Medicine, Aurora, CO; ⁶Icahn School of Medicine at Mount Sinai, New York, NY

BACKGROUND

- Brorphine is a novel piperidine-based opioid that first appeared in the United States in June 2020
- Butyrylfentanyl is a short-acting fentanyl analog

OBJECTIVES

- This case series from the Toxic fentanyl database reviews the course of patients presenting to the emergency department (ED) following overdoses of either brorphine or butyrylfentanyl

METHODS

- This is a case series from the Toxic Fentanyl study group
- The Fentanyl study group includes 9 sites from across the United States
- Consecutive ED patients following an acute overdose and available waste blood samples were screened for inclusion
- Children, prisoners and patients with a non-toxicological diagnosis or severe trauma were excluded
- Following chart review, information from included patients was abstracted and entered into a REDCap database
- Left over blood samples were obtained and sent to the Center for Forensic Science Research and Education for analysis
- Confirmation was performed via liquid chromatography quadrupole time-of-flight mass spectrometry for over 900 novel psychoactive substances
- Patients positive for either brorphine or butyrylfentanyl are described

RESULTS

- Between 9/21/20-3/9/21, 481 patients were screened
- 173 patients met inclusion criteria
- 2 tested positive for brorphine
- 3 tested positive for butyrylfentanyl
- All 5 patients were enrolled from Barnes Jewish Hospital (St. Louis, MO), which enrolled a total of 34 patients during this timeframe
- No patient was positive for both substances

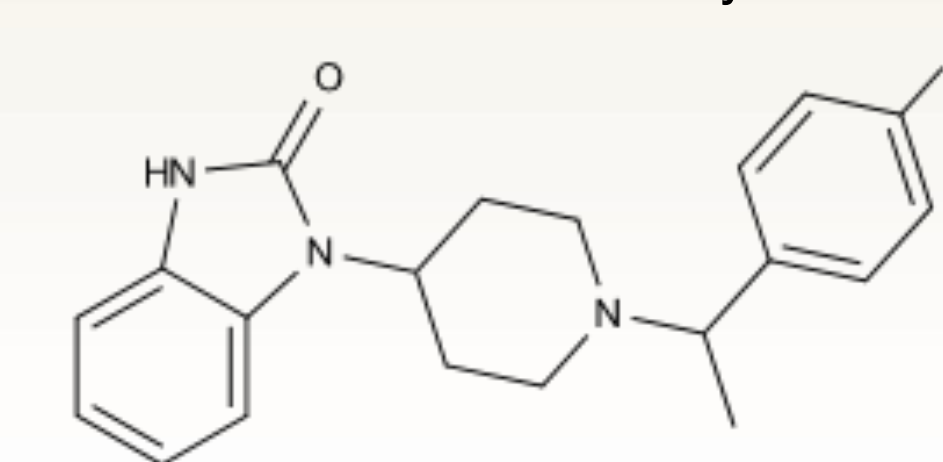
Age Range	36-75 years
Sex	3 men, 2 women
Naloxone Received	2 in the hospital 2 by EMS 1 Both
Disposition	4 discharged from ED (LOS 8-13 hrs) 1 admitted to the ICU 2 patients admitted to psychiatry
Other xenobiotics confirmed with brorphine	clonazepam, cocaine, eutylone, bupropion, diphenhydramine, levamisole, lidocaine, quinine, methamphetamine, heroin, acteylfentanyl
Other xenobiotics confirmed with butyrylfentanyl	xylazine, lidocaine, quinine, cocaine, methadone, tramadol, levamisole, fentanyl, diphenhydramine

ADMITTED PATIENT

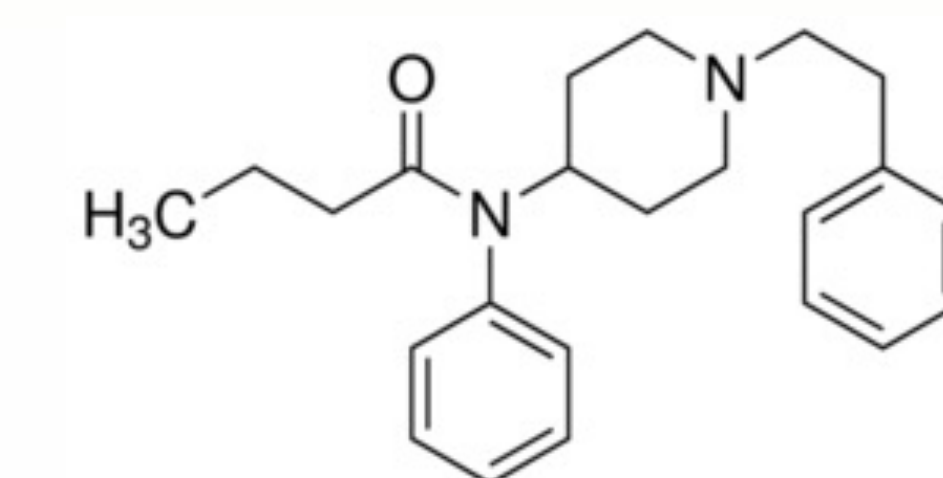
- 75 y/o male positive for butyrylfentanyl
- Received 2 mg naloxone IM by EMS X1 and in the ED (2 mg IN followed by 0.4 mg IV) and intubated
- Initial lactate 10.7 mmol/L, pH 6.95, CO₂ 101, Cr 1.35mg/dl, glucose 481 mg/dl
- Intubated for 40 hours and required vasopressors
- Recovered uneventfully and discharged after 67 hours in the hospital

CONCLUSIONS

- Brorphine and butyrylfentanyl were detected in 5 patients presenting to a single hospital in St. Louis, MO following an opioid overdose
- No patients from another site tested positive for either opioid
- All 5 patients recovered uneventfully
- 1 patient exposed to butyrylfentanyl did have a prolonged ICU course due to multisystem organ failure



Brorphine



Butyrylfentanyl