EMS ketamine use for agitated patients on cocaine increases intubation 5.75-fold

September 29 2021

One 10 ml vial of 1000 mg ketamine. Credit: Psychonaught/Wikipedia

Patients with excited delirium who are combative, aggressive or agitated

before being transported to the hospital or in an emergency department setting require immediate treatment for their safety and others. In the past, physical restraint was the predominant method used to control a patient during transport. However, due to safety issues, prehospital ketamine—a powerful sedative—is now commonly used to restrain patients experiencing excited delirium. Emergency medical services providers typically administer ketamine intramuscularly, which takes effect in about three to four minutes.

Ketamine is safe and well-tolerated when administered in a controlled environment such as a hospital for procedural sedation, as patients rarely lose their airway or respiratory drive. Although ketamine use is prevalent, evidence on safety and efficacy is limited and risk factors for respiratory arrest and intubation have not been well studied. Furthermore, many patients with excited delirium are intoxicated or are using illicit substances and these co-ingestants may alter the properties of the drug.

Researchers from Florida Atlantic University's Schmidt College of Medicine conducted a study to explore whether patients treated with prehospital ketamine for excited delirium with concomitant substance intoxication have higher rates of subsequent intubation in the emergency department compared to those without confirmed substance usage.

Results of the study, published in the journal *Prehospital and Disaster Medicine*, showed that among 86 patients given prehospital intramuscular ketamine for excited delirium, those with concomitant cocaine intoxication had a statistically significant 5.75-fold increased rate of subsequent intubation in the emergency department, which were higher in men than women. There were no deaths reported.

Patients testing positive for alcohol, amphetamines, barbiturates, benzodiazepines, ecstasy, marijuana, opiates, and synthetic cathinones,

both bath salts and flakka, had similar rates of intubation compared to those negative for these substances. Baseline characteristics including age, ketamine dose, and body mass index were similar between those who did or did not undergo intubation.

"While additional research is needed, it is tempting to speculate about possible mechanisms whereby prehospital ketamine administered intramuscularly for excited delirium with concomitant cocaine intoxication may increase subsequent intubation in the emergency department," said Joshua J. Solano, M.D., first author, an emergency medicine physician, an assistant professor of emergency medicine and integrated medical science, and director of quality improvement and patient safety, FAU Schmidt College of Medicine. "One plausible explanation is that cocaine may deplete excitatory neurotransmitters and lead to an exaggerated respiratory depression requiring intubation."

Over the course of 28 months, all medical records from two large community hospitals were searched for all patients age 18 years or older with intramuscular administration of ketamine for excited delirium and identified illicit and prescription substance co-ingestions.

For the study, trained abstractors collected demographic characteristics, history of present illness, urine drug screens, alcohol levels, and noted additional sedative administrations. Substance intoxication was determined by urine drug screens and alcohol positivity or negativity, as well as physician history of present illness. Patients without toxicological testing or documentation of substance intoxication, or who may have tested positive due to emergency department sedation, were excluded from relevant analyses. Subsequent emergency department intubation was the primary pre-specified outcome.

More information: Joshua J. Solano et al, Prehospital Ketamine Administration for Excited Delirium with Illicit Substance Co-Ingestion

and Subsequent Intubation in the Emergency Department, *Prehospital and Disaster Medicine* (2021). DOI: 10.1017/S1049023X21000935