

A Case of K2-Abuse with Hyperthermia and Cardiac Arrest in an Elderly Patient

Case report

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Received: Jan 30, 2020; **Accepted:** Feb 18, 2020; **Published:** Feb 19, 2020

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Introduction

Synthetic Cannabinoid Receptor Agonists (SCRAs) are a group of products created using plant products sprayed with chemical agents that act on cannabinoid (CB) receptors. These agents sold as K2 or Spice are a pure agonist on CB receptors and are potent compared to the tetra hydro cannabinol (THC) [1-5]. Several adverse medical and psychiatric effects including seizures, cardiovascular adverse events and as well as hyperthermia and rhabdomyolysis have been reported [6-8]. Here, we report a case of elderly patient with SCRAs-induced hyperthermia and cardiac arrest.

Care Presentation

A 67-year-old African American male was brought to the Emergency Department (ED) by Emergency Medical Services (EMS). He has a history of polysubstance abuse including K2 abuse and has medical and psychiatric illnesses. The patient was found in the park unresponsive and was seen smoking k2 earlier that day according to witnesses.

On arrival, he was unresponsive with vomit on his face. The patient was placed on a cardiac monitor while preparing for intubation. Large-bore intravenous (IV) lines and started normal saline boluses. The patient had palpable carotid pulses, and cardiac monitor demonstrated a heart rate of 180 beats per minute with a narrow complex rhythm suggesting supraventricular tachycardia (SVT). The patient was treated with an initial dose of adenosine 12 mg and

the heart rate subsequently reduced to sinus tachycardia between 120-140 beats per minute. The blood pressure was 92/56 mmHg. The patient was successfully intubated and placed on the ventilator. The rectal temperature was noted to be 108.2-degree Fahrenheit. Aggressive cooling measures were started, but shortly thereafter the patient lost his pulse. Cardiopulmonary resuscitation following ACLS protocol was initiated with ROSC. His blood pressure was 60/40 mmHg. A norepinephrine drip was started. Even though the high temperature was likely from K2 the decision was made to treat him for possibility of sepsis with broad spectrum antibiotics. The patient lost pulse again and all measures to resuscitate failed. He was pronounced dead.

Discussion

Several generations of SCRA with a variety of potencies have been coming to the market leading to several adverse effects [2,6,9]. Sold as non-toxic incense K2 has been a cheaper choice for many young adults [10,11]. Our group has reported case series of cardiovascular effects from SCRAs abuse including in elderly patients [12,13]. The cardiovascular effects seem to be through several mechanisms via ion channels and CB receptors [14-17]. We have also reported a case of SCRAs-related hyperthermia and renal failure in the past [18]. Rhabdomyolysis and renal failure of varying degrees are known complications of SCRA. The proposed mechanism for renal effect is believed to be thrombotic microangiopathy disease [19].

Hyperthermia occurs on occasion from SCRA abuse, but the exact mechanism is unknown.

This is the first known death from presumed SCRA abuse in our ED. Elderly patients are known to have problems with prescription opioid medication and substance abuse [20-22]. Mental health problems and substance abuse complicate therapy for the mental disorder and counseling for substance abuse disorder. Even if the exact mechanism of SCRA effect on several organs/ organ systems is not fully understood, the effects appear to be predominantly mediated via CB receptors. This might be reason for the severity of adverse clinical and psychiatric effects than those seen from THC. In addition, physiological changes in elderly can contribute to the severity of the side effects of SCRA as well as other drugs [23-25]. Even the smallest amount of drug can have severe adverse effects on elderly patients.

Limitations

No laboratory confirmatory study of body fluids for the presence and type of SCRA and/or the presence of other drugs that could cause rhabdomyolysis such as Cocaine.

Conclusion

Serious adverse effects including death can occur from SCRA abuse. The very young and the very old patients are at a higher risk. SCRA can affect elderly patient leading to complications such as hyperthermia and cardiac arrest. Elderly patients may have exaggerated reaction to drugs due to comorbidities, physiological changes and polypharmacy.

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