Clinical Vignette: Synthetic Cannabis-Induced Pneumonitis

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Introduction

Synthetic cannabinoids bind to two different receptors and produce effects similar to the active substance in cannabis: Δ9-tetrahydrocannabinol or THC. Neurologic and psychiatric effects of synthetic cannabis have been studied and include, but are not limited to mood elevation, relaxation, aggression, and psychosis [1,3]. Respiratory effects, however, are infrequently documented. Our patient is a unique example of the respiratory effects of K2, a synthetic cannabinoid.

Case Presentation

- ***Demographics***: 42-year-old male
- ***PMH:*** seizures, usage of a synthetic cannabinoid known colloquially as K2 or Spice
- ***Initial Presentation****:* Found unresponsive
    - Vitals: afebrile, tachycardic, hypertensive, and had desaturated to 82% on room air, which improved with four liters of oxygen.
- ***Labs:***
    - Creatinine kinase elevation to 654, and a leukocytosis of 12 mg/dL.
    - Urine drug screen: positive for natural cannabinoids (synthetic cannabinoids are not detectable on the urine drug screen)
    - Tests for viral infections, including influenza, RSV, and COVID were negative.
- ***Imaging:***
    - CT chest showed diffuse multilobar airspace opacities seen throughout all lung fields (Figure 1)
- Antibiotics started at admission were stopped. The following day, the patient was able to maintain adequate oxygenation on room air.
- The patient's symptoms resolved within 24 hours, pointing to K2 usage as the cause of transient pneumonitis.

Figure 1. Diffuse multilobar airspace opacities

Discussion

- Synthetic cannabinoids, such as K2, often are more easily accessible and less expensive compared to their pure forms, making them increasingly popular among the general population
- In the northeast region of the United States, there have been more than 1200 emergency department visits per month related to synthetic cannabis ingestion, making it a prevalent health concern [1].
- The most common demographics of synthetic cannabis users are 20-30 year old males [2].
- Previous case series described the pulmonary effects of synthetic cannabinoids as diffuse centrilobular opacities in a tree-in-bud pattern on CT imaging [4], while non-synthetic cannabis users often demonstrate low lung attenuation in the apices [5].

	K2 Overdose	Our Patient
Presenting symptoms:	*Tachycardia, hypertension,* hallucinations, mood elevation, aggression, kidney injury	*Tachycardia, hypertension,* Respiratory distress
CT imaging	*diffuse centrilobular opaci*ties in a tree-in-bud pattern	*diffuse multilobar airspace opacities* seen throughout all lung fields
Clinical Course	If respiratory symptoms are present, patients typically *recover in less than 24 hours*[1]	*Respiratory symptoms resolved in <24 hours*, no further requirements of supplemental oxygen

Table 1. Comparison and Contrast between a Typical K2 Overdose and Our Patient

Conclusion

- In the absence of other infectious or neurological causes, the cause of this patient's transient lung injury can be attributed to K2 toxicity. This case demonstrates the value of considering exposure to synthetic cannabinoids as a cause for pneumonitis in young adult patients presenting with acute-onset dyspnea.

References

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