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Acute Pancreatitis in A Young Adult with Extensive Cannabis Use in Pure Drip Vaping: A Case Report

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ABSTRACT

Cannabis is the most widely used recreational drug worldwide, and now after its legalization, it is used by more than half of the population of the United States either for recreational or medicinal use. Recently, cannabis has been implicated as a cause of acute pancreatitis when no other etiology is identified. This case report discusses a 19 -years-old male with no significant past medical history apart from extensive cannabis and vaping abuse, presenting with the unique clinical picture of acute pancreatitis. Additionally, we emphasized that cannabis use is emerging as an overlooked cause of acute pancreatitis and that screening for cannabis use with careful history and/or urine toxicology is crucial. Hence, to bring to notice the rising incidence of cannabis-induced pancreatitis, we report a case of acute pancreatitis with no identifiable risk factor apart from heavy cannabis use in pure drip vaping.

Keywords: Case Report; Cannabis use; Pure Drip Vaping; Healthy adult; Acute Pancreatitis

INTRODUCTION

Cannabis is the most widely used recreational drug worldwide,[1-2] and now after its legalization, it's used by more than half of the population of the United States[3] either for recreational or medicinal use. It is used medicinally to treat nausea and vomiting secondary to chemotherapy. It is also used to treat irritable bowel syndrome, cancer-related pain, pain in the abdomen, and to reduce the flare of inflammatory bowel disease.[4] Documented side effects of cannabis include paranoia, psychosis, infertility, and visual changes.[1-2 ,5] Recently, cannabis has been implicated as a cause of acute pancreatitis when no other etiology is identified.[1,6] Other prescription medications account for 2% of cases of acute pancreatitis, while cannabis accounts for even fewer cases.[2] Recognizing the cause of acute pancreatitis is crucial to preventing a recurrence. To bring to notice the rising incidence of cannabis-induced pancreatitis, we report a case of acute pancreatitis with no identifiable risk factor apart from heavy cannabis use. The patient was informed that data concerning the case would be submitted for publication, and he provided an informed consent.

CASE DESCRIPTION

A 19-years-old male with no significant past medical history presented to the ER with epigastric pain, abdominal tenderness, and nausea for the past 15 hours. The patient denied any alcohol use. However, he reported a significant use of drugs (for the past seven years and every day for the past two years. Family history was non-contributory. The patient reports pain was 10/10 intensity, non-radiating, aggravated by lying down, and improved by sitting. Associated symptoms included three episodes of liquid diarrhea without blood or mucus and nausea but no vomiting. The patient denied any similar episodes of pain in the past. The patient denies travel history, sick contact, vomit, fever, chills, shortness of breath, or chest pain. On a physical exam, the patient is alert and oriented x4, BMI (19kg/m^2), vital signs were blood pressure 128/67 mmHg, heart rate 102 beats per minute, 99 F temperature, respiratory rate 20/min and the patient was saturating 98 % on room air. Chest and heart examination was unremarkable. Neck examination did not reveal any lymphadenopathy or thyroid gland enlargement. Abdominal examination was positive for tenderness on light palpation in the epigastrium with no rebound tenderness or guarding. Labs were significant for elevated White Blood Cells (14.2, reference range 3.4-11.0 10*3/uL (Neutrophils 85.2%), Serum Lipase 851, (reference range 0-160 U/L, and Serum potassium 3.4 (reference range 3.6 to 5.2 mmol/L). The remainder of his complete blood count, serum electrolytes, serum calcium, serum creatinine, serum urea, aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase, lactate dehydrogenase, serum bilirubin, cholesterol, and triglycerides were within their reference range. COVID negative rapid test. Urine Drug screen was positive for Tetrahydrocannabinol (THC). Serum Ethanol levels was negative. Chest Xray showed normal cardiac silhouette with no focal pulmonary consolidation or pleural effusion (Figure 1). Electrocardiogram (EKG) demonstrated nonspecific ST segment, T wave changes (Figure 2). Abdominal Ultrasound was performed to rule out obstruction and was unremarkable. Computed Tomography (CT) Abdomen and Pelvis was subsequently performed and showed a borderline enlarged and edematous appearance of the pancreas. Additionally, generalized increased attenuation of the mesentery with small volume ascites surrounding the tail of the pancreas and coursing inferiorly down the left peri-colic gutter into the pelvic cavity were noted. The pancreatic ducts were not dilated. These findings are suggestive of acute interstitial edematous pancreatitis. The patient had no SIRS criteria, BISAP Score 0 (less than 1% of mortality), and CT severity index (Balthazar score) was 2. Given the patient clinical presentation of abdominal pain, and lipase levels elevation more than three times the upper limit of normal, the revised Atlanta Criteria [7] to diagnose mild acute pancreatitis was met. The patient's medical and social history and positive THC urine drug screen raised the possibility of cannabis-induced pancreatitis. The blood tests and imaging studies ruled out gallstones, alcohol, or hyperlipidemia as possible causes of acute pancreatitis. Utilizing the Naranjo Nomogram for Adverse Drug Reaction Assessment,[8] to help confirm the possibility of cannabis-induced pancreatitis, the patient's Naranjo score was.[9] The score of ≥ 9 corresponds with a rating of definitive adverse drug reaction (i.e., reaction followed a reasonable temporal sequence after a drug or in which a toxic drug level had been established in body fluids or tissues, followed a recognized response to the suspected drug and was confirmed by improvement on withdrawing the drug and reappeared on re-exposure). This confirmed cannabis as the cause of his acute pancreatitis. The patient was admitted to the Intensive Care Unit for further management. The patient was made NPO, and IV fluids (2-3

liters Lactate Ringer IV) were started in a peripheral line. Pain control was managed with morphine IV. After resolution of symptoms the patient was counseled on the dangers of illicit drug use and discharged home with a scheduled follow up visit with his primary physician

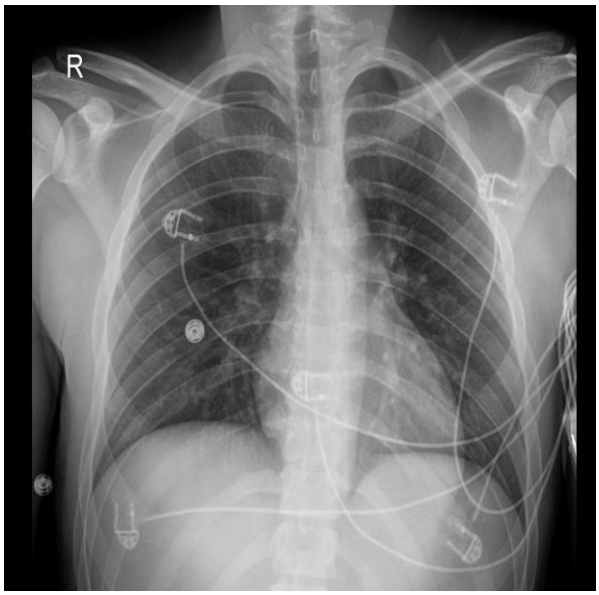


Figure 1: Chest X-ray: showing normal cardiac silhouette and no focal pulmonary consolidations or pleural effusions.

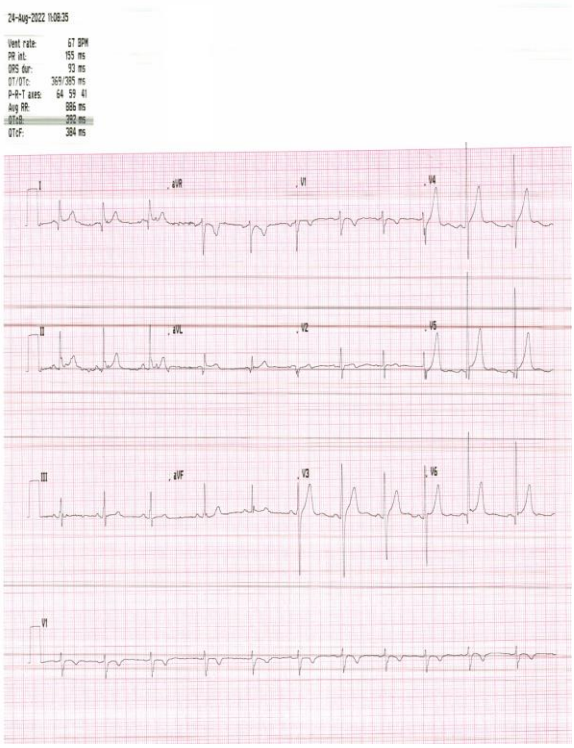
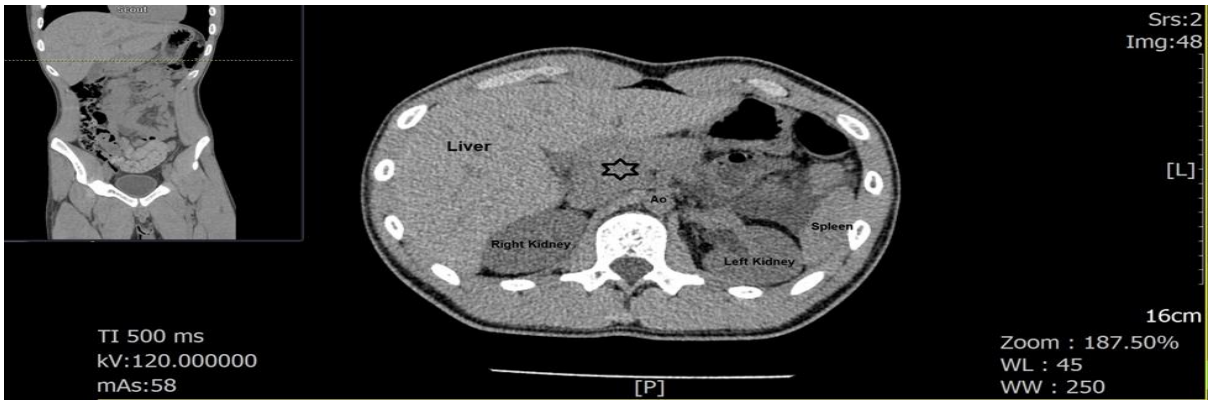


Figure 2: ECG showing sinus Rhythm. Sinus arrhythmia was noted.

3A)



3B) **3C)**

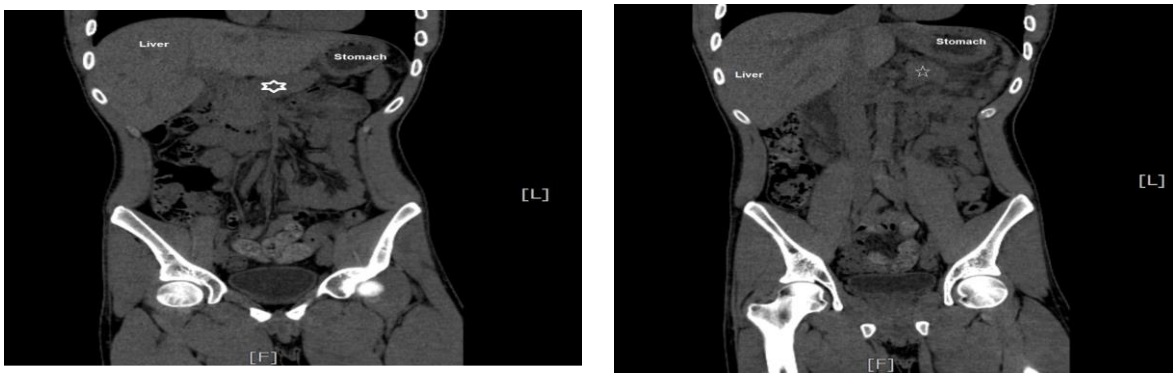


Figure 3: Computed tomography of the Abdomen without Contrast agent showing Pancreas segmentation in the **A)** Axial plane, **B)** Coronal plane, and **C)** modified coronal plane to show the Tail of the pancreas. Finding of acute interstitial pancreatitis. There is a borderline enlarged and edematous appearance of the pancreas (marked Star). Additionally, there is a generalized increased attenuation of the mesentery (seen in image B) with small volume ascites surrounding the tail of the pancreas and coursing inferiorly down the left peri-colic gutter into the pelvic cavity. The pancreatic ducts do not appear to be dilated. Visualized lymph nodes are normal in size and morphology.

DISCUSSION

Our case report adds to a growing list of cases of cannabis-induced pancreatitis. Awareness of this finding is critical as cannabis legalization will only expand these occurrences. Cannabis-induced acute pancreatitis is considered a diagnosis of exclusion.[5] A thorough history, including possible substance use, is essential in patients with idiopathic acute pancreatitis. Furthermore, identification of cannabis use dosing and length can help diagnose cannabis-induced pancreatitis in this age of growing incidences of cannabis use. In our case, the patient admitted to extensive long term cannabis use in Pure Drip Vaping devices. Numerous case reports have utilized the Naranjo nomogram for adverse drug reaction probability scale to support the diagnosis of cannabis-induced pancreatitis.[6-9]

To date, there is no specific guideline to confirm the diagnosis.[9-10] It could be beneficial if the tool is incorporated into future guidelines for diagnosing cannabis-induced pancreatitis. Simons-Linares and colleagues [5] also reported an extensive data analysis from the national inpatient sample database ranging from 2003-2013 for patients with acute pancreatitis and active exposure for cannabis in 0.3% of patients. The researchers in this

study (5) reported that the cannabis-exposed group had significantly lower inpatient mortality, decreased length of stay, and a lower risk of severe complications, including acute kidney injury, shock, and nutritional requirements. This indicates that episodes of cannabis induced acute pancreatitis tend to be less severe. Indeed, that was the case in our patient. Recovery and clinical improvement occurred within 48 hours of admission. While the pathophysiology for cannabis induced acute pancreatitis is still under investigation, it was shown that in humans, Cannabinoid receptor 1 (CB1) and Cannabinoid receptor 2(CB2) are the two primary receptors acted upon by cannabis. CB1 and CB2 receptors are weakly expressed in the islet of Langerhans of the pancreas.[9] An experimental study carried out by Dembinski et al. in murine models showed that higher levels of anandamide, an endogenous cannabinoid ligand, contributed to the worsening of pancreatitis.[10] Subsequently, survival improved when rats were given CB1 antagonists.[10] This suggests a possible dose-dependent role of cannabis in the further deterioration of pancreatitis. Human studies to prove these findings are yet to be carried out. However, a recent systematic review carried out by Barkin et al.[6] does demonstrate increased use of cannabis among patients before being diagnosed with acute pancreatitis. In that review of 26 cases, more than half stated increased use of cannabis. Thirteen cases reported resolution after cessation, while the other 13 reported recurrence with continued cannabis use.[6] Treatment of cannabis-induced pancreatitis is mainly similar to other causes of pancreatitis; cessation of cannabis has shown resolution. [6] Health care providers must list cannabis as a possible cause of pancreatitis to avoid misdiagnosis, leading to unnecessary disease recurrences.

CONCLUSION

Despite sporadic case reports of cannabis induced acute pancreatitis, data is still lacking regarding the pathophysiology and role of cannabis in acute pancreatitis. Careful history taking, physical examination and urine toxicology screen should be part of the laboratory work up for cases of acute pancreatitis without identifiable etiology.

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