

Bonzai victims; a new experience in our intensive care unit

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ABSTRACT

We examined the hospital files of five patients who were followed in Erzurum Region Training Hospital Intensive Care Unit (ICU) due to synthetic cannabinoid (SC) use between November 24th 2014 and February 28th 2015. Age range was between 18-67. Despite all treatment two of the patients died. Three of them were discharged from the ICU with full recovery. Three of the patients were intubated and admitted after cardiopulmonary resuscitation. Coronary Angiography (CAG) was performed for these intubated patients and two of them were in normal ranges. One of the patients had diabetes mellitus (DM) and one of them had Familial Mediterranean Fever. Only the patient with diabetes mellitus history had an abnormal coronary angiography and a coronary artery stent was implanted. In this report we aimed to draw attention to synthetic cannabinoid use in patients who are admitted to emergency services with altered consciousness and describe the possible relation between acute coronary syndrome and synthetic cannabinoid use.

Key words: Bonzai, acute coronary syndrome, intensive care unit, synthetic cannabinoid.

Introduction

Cannabinoids are agents that function through their own specific receptors [1]. There are two cannabinoid receptors; CB1 and CB 2 [1]. CB1 receptors are mainly localized in the cerebral cortex, basal ganglia and cerebellum and to a lesser degree in the heart, lungs, liver, skeletal muscle and thymus [2]. CB2 receptors are located mainly in the immune system or related cells [3]. CB1 receptors are responsible for euphoria, they are anticonvulsant and analgesic, and have thermoregulatory, antiemetic, tachycardic, vasodilatory and hypotensive effects [4]. Whereas CB2 receptors are responsible for anti-inflammatory effects [5]. Cannabinoids cause negative inotropic effect on the myocardium, vasodilatation and bradycardia by inhibiting noradrenaline secretion from autonomic nerve endings through CB1 receptors in the cardiovascular system. This results in hypotension [6].

The most common cannabinoid is Δ -9-tetrahydrocannabinol. Cannabinoids can be consumed as cigarettes, transdermal patches, chewable forms, intravenous, sublingual or rectal suppositories.

Synthetic cannabinoids (SCs) are more potent synthetic form of cannabinoids. Despite the fact that most of the cannabinoids were developed for medical purposes, later on illegal laboratories started to produce them and their misuse became widespread. Since 2004 SC are available in the market and became popular as 'legal high' [7]. In Turkey it is mostly sold as Bonzai, Spice or Jamaica. Mean age of start to illegal addictive substances in Turkey is reported to be very low [8].

Long-term use of SC can cause addiction and withdrawal symptoms similar to cannabis [9], whereas acute intoxication causes tremor, tachycardia and anxiety, which are similar to effects of stimulant and sympathomimetic agent use [9]. Unlike normal cannabinoids, SC can cause up to 100 times higher effects due to components like HU-210, CP-47, JWH-018 and JWH-073. These effects are tachycardia, vomiting, anxiety, increased verbal or motor activity, excessive sweating and hallucinations. These substances can also cause complications like acute renal failure, hypotension, hypertension,

hyperglycemia, acute myocardial infarction and hypokalemia [10]. There are reports about myocardial infarction with ST segment elevation [7]. These complications can be fatal.

The aim of this paper was to report unconscious, intubated or post CPR patients who were admitted to the anesthesia ICU after consuming SC using data from hospital files, information gathered from patients or their relatives after obtaining Erzurum Research and Training Hospital Ethical Committee approval (date:17.03.2015, no:2015/6-42).

Description of the cases

The clinical course and management of five patients with bonzai abuse who were admitted to our anesthesiology ICU are explained below. After firstly being evaluated in the emergency department, informed consent was obtained and the patients were transferred to our ICU.

Case 1: An 18 year old male patient was admitted to our emergency department in a confused state with a Glasgow Coma Scale (GCS) of 13 (E3V4M6). He was an unemployed man and a current tobacco smoker. His past medical history revealed Familial Mediterranean Fever and Bonzai use twice before. His ECG, liver and kidney function tests were in normal limits at admission and during follow up. During hospitalization his cranial tomography was normal. He was managed by oxygen therapy with mask and saline hydration. He was transferred to the internal medicine clinic with a GCS of 15 (E4V5M6) on the fourth day of hospitalization.

Case 2: A 19 year old unemployed male patient was admitted to our emergency department in a confused state with a GCS of 13 (E3V4M6). He was a current tobacco smoker without remarkable past medical history. He had been using Bonzai for three years. His ECG, liver and kidney function tests were in normal limits at admission and during follow up. During hospitalization his cranial tomography was normal. He was managed by oxygen therapy with mask and saline hydration. He was transferred to the internal medicine clinic with a GCS of 15 (E4V5M6) on the fourth day of hospitalization.

Case 3: A 40 year old salesman was admitted to our emergency department intubated after 25 minutes of cardiopulmonary resuscitation with a GCS of 3 (E1V1M1). He was a current smoker without remarkable past medical history, he had been using Bonzai for 6 months. His ECG, liver and kidney function tests were in normal limits at admission and

during follow up. His cranial tomography and coronary angiography were in normal limits. He was connected to the mechanical ventilator and managed by thiopental sodium infusion (1.5 mg/kg/hour) in our ICU. He experienced ventricular fibrillation on the third day of hospitalization and was defibrilled by 270 joule. The thiopental sodium infusion was discontinued on the third day. He was extubated on the fifth day of his hospitalization and transferred to the internal medicine clinic with a GCS of 15 (E4V5M6) on the seventh day of hospitalization.

Case 4: A 58 year old farmer was admitted to our emergency department intubated after 35 minutes of cardiopulmonary resuscitation with a GCS of 3 (E1V1M1). He was a current smoker without remarkable past medical history. We could not learn how long he had been using Bonzai His cranial tomography and coronary angiography were in normal limits. He was connected to the mechanical ventilator and managed by thiopental sodium infusion (1,5 mg/kg/hour) in our ICU. The thiopental sodium infusion was stopped on the third day. He died on the fourth day of hospitalization because of brdycardia and sudden hypotension while he was under mechanical ventilation.

Case 5: A 67 year old farmer was admitted to our emergency department intubated after 20 minutes of cardiopulmonary resuscitation with a GCS of 3 (E1V1M1). He had history of smoking and diabetes mellitus. We could not learn how long he had been using Bonzai His cranial tomography at admission was in normal limits. He was connected to the mechanical ventilator and managed by thiopental sodium infusion (1.5 mg/kg/hour) in our ICU. His troponin levels were elevated at admission and on the second day of hospitalization a coronary stent was implanted in his left anterior descending artery. The thiopental sodium infusion was stopped on the third day. He died because of hypotension resistant to fluid and inotropic support on the fifty sixth day of hospitalization while he was under mechanical ventilation.

Discussion

Use of SC is a major problem throughout the world and it is a serious public health problem in Turkey [11]. Reasons for emergency room admissions due to changes in consciousness are mainly metabolic (hypoglycemia etc.), traumatic, neurologic (intracranial hemorrhage, cerebrovascular incidents), infectious (meningitis) with intoxications and alcohol use.

SC use has been increased in recent years among young people and they can cause alterations in mental state, as a result, it should be kept in mind for patients admitted to emergency rooms with altered consciousness.

Symptoms of SC use according to their frequency are reported as tachycardia (40%), agitation (23%), confusion (12%), hypertension (8,1%), chest pain (4,7%), syncope (2,1%) and bradycardia (1,3%) [12].

Addictive substances have been reported to cause several cardiovascular effects. Cocaine causes coronary artery vasospasm and myocardial ischemia. Whereas cannabis causes has been reported to cause a dose related increase in resting heart rate, postural hypotension and carboxyhemoglobinemia and therefore it decreases myocardial oxygen supply and increases myocardial oxygen demand. These effects can lead to acute myocardial infarction. Whether SCs cause rupture in coronary artery plaques or thrombocyte aggregation remains unclear, however, they cause negative inotropic effects, bradycardia and hypotension (due to vasodilatation) [6]. It is thought that acute coronary syndromes due to SC use are related to these effects. Acute myocardial infarction with ST

elevation has been reported in three patients who had used SC for three months [13]. Possible pathophysiology for these reported acute myocardial infarctions can be coronary arterial spasm due to these substances with unknown mechanisms [7].

SC use was identified for all of our patients (medical history obtained from relatives of unconscious patients and from both relatives and patients themselves whom were conscious). None of the patients had family history of coronary artery disease. Two of the three patients who were resuscitated after cardiac arrest had normal coronary angiograms and one of them received a coronary stent.

Rehabilitation is essential in patients with Bonzai use like all other addictive substances. Therefore ICU specialists should work in coordination with psychiatrists in the management of these patients.

In this report we aimed to emphasize that SC use should not be ignored in patients with altered consciousness due to increased use especially in young patients. It should be considered in patients who are admitted to the emergency department with cardiac arrest and without any clear reason for acute myocardial infarction.

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