Bonzai intoxication in children: our experience with 17 cases

Sevgi Yaşar-Durmuş[1], Nilden Tuygun[2], Halise Akça[2], Emine Polat[1], Can Demir Karacan[2]

[2]Division of Pediatric Emergency Medicine, [1]Department of Pediatrics, Dr. Sami Ulus Maternity and Children's Research and Training Hospital, Ankara, Turkey. E-mail: drsvgysr@gmail.com

Received: 5 June 2015, Revised: 19 August 2015, Accepted: 28 September 2015

SUMMARY: Yaşar-Durmuş S, Tuygun N, Akça H, Polat E, Karacan CD. Bonzai intoxication in children: our experience with 17 cases. Turk J Pediatr 2015; 57: 453-457.

Synthetic cannabinoid receptor agonists are becoming increasingly popular in adolescent age group as an abused substance. Therefore, pediatric emergency physicians should be prepared for Bonzai utilizations which are being more common day by day. The aim of the study is to investigate cases who admitted to a pediatric emergency service with use of Bonzai.

Key words: child, emergency department, synthetic cannabinoids.

Synthetic cannabinoid receptor agonists are becoming increasingly popular in adolescent age group as an abused substance. Many of these drugs are much more potent than cannabinoids, thus, the psychoactive dose may be <1 mg[1]. Synthetic cannabinoids have been classified in seven groups based on their chemical structure by British Advisory Council on the Misuse of Drugs (ACMD). Bonzai is a synthetic cannabinoid which is in the naphthoylindoles group according to (ACMD) classification[2].

The abusive use of synthetic cannabinoids results in anxiety, nausea, vomiting, tachycardia, elevated blood pressure, tremors, seizure and hallucinations[2]. Because of these effects, in recent years, synthetic cannabinoids are found in illegal 'fake marihuana' with different street names and are usually sold as a mixture of herbs sprayed with a synthetic compound[3].

Synthetic cannabinoids have been sold via the internet as early as 2004. European nations began recognizing the dangers of synthetic cannabinoid use and have since placed regulatory bans on the sale of synthetic cannabinoid components in 2008[4]. In Turkey, the first capture of a synthetic cannabinoid by the police departments was in May 2010 and then they banned in 2011[2-5]. Although they banned, synthetic cannabinoid use it continues to remain major health problems among adolescents and young adults.

According to the recent reports of Turkey Statistical Institute TSI of Turkey, in 2013, 115,439 children admitted to the security unit, 41.9% of them were using alcohol and drugs, 13.9% of them were using cannabinoids. Bonzai use constitutes 0.4% of alcohol and drug use in childhood. The age of first Bonzai use has fallen below 11 years[6]. Thus, pediatricians will encounter much more with Bonzai users. There are so many reports regarding cannabinoids. However, to our knowledge, there are only a limited number of studies about synthetic cannabinoids with no specific to Bonzai.

The aim of the study is to investigate cases who admitted to a pediatric emergency service with use of Bonzai. It is also the first study to describe synthetic cannabionid use in adolescence, from Turkey.

Material and Methods

A review of medical reports of patients who admitted to pediatric emergency service of our hospital with a diagnosis of alcohol and/or substance abuse between January 2012 and June 2014 was performed retrospectively. Among these patients, Bonzai users were included in the study. Demographic features of the patients regarding age, sex, clinical presentations, usage form of Bonzai, the number of cases in time, and history of previous substance abuse were recorded. Repeated physical examinations and laboratory investigations including complete blood cell, liver and renal function tests, creatinine kinase and troponin levels, serum C-reactive protein levels and arterial blood

gases in about six hours were performed. All patients had supportive care with a mixture of saline and 5% dextrose and oxygen with mask. Duration of hospitalization, management, complications, and outcome were recorded. National Poisons Centre was conducted for all patients and suggestions of the center were taken account.

Statistical analysis

Data were entered into a database, and statistical analyses were performed using the Statistical Package for the Social Sciences (version 15.0, SPSS, Inc., Chicago, IL). The overall results of this study were expressed as percentages for categorical variables, means±SD, and as medians for continuous variables.

Results

The total number of cases with alcohol and/or substance abuse in the study period was 44. Seventeen cases with Bonzai use were included to the study. There were 10 (58.8%) boys and 7 (41.2%) girls ranging in age from 13.5 to 18 years (mean age: 16±1.27). Fourteen patients (82.4%) had Bonzai via inhalation and three (17.6%) had orally. All of the patients had normal ranges in vital signs on admission. Demographic features, clinical manifestations, physical examinations, management and outcome are summarized in Table I. None of the patients had pathological laboratory results on admission and during follow-up. Distribution per six months of the patients are shown in Figure 1.

Average observation period was found to be 10.6 ± 7.6 hours in the cases. Three of the cases (17.6%) escaped from the hospital before the completion of the observation period while four of the cases (23.6%) were discharged from the hospital with the demand of their families and under the supervision of the police. Remaining 10 cases completed their observation period in the hospital. No complication was recorded in 14 of the cases (82.3%) during the observation period.

Number 17 patient had a suicide attempt and he was rescued while trying to jump on the train tracks. On admission he had unconscious mental status with a Glascow Coma Scale (GCS) of 8. He recovered uneventfully after six hours but he left pediatric emergency service without referral to any center.

Number 1 and 17 patients who had GCS of 8 in initial evaluation regained consciousness in a short time, in pediatric emergency service. None of patients needed monitoring in pediatric intensive care unit.

Bradycardia developed in one patient three hours after the utilization of Bonzai. Cardiac apex beat of the patient was 50/min. Echocardiography was compatible with sinus bradycardia with no myocardial dysfunction. In the 20th hour, pulse rates returned to normal ranges in accordance with the patient's age with no additional treatment. Of the patients who did not wish to complete the observation period in the hospital and who were discharged under the supervision of the police, 1 patient applied to the hospital with the complaint of dystonic spasms 10 hours after the utilization of Bonzai; the patient who was taken under observation received biperiden treatment which resulted in the regression of spasms. Additional problems were not recorded in the observation of the patient.

Six of 17 cases (35.3%) were sent to Alcohol and Substance Abuse Treatment and Training Center (AMATEM); three of them (17.6%) were followed-up by the department of adolescent psychiatry, one case (5.9%) was directed to the youth center. Three patients having escaped from the hospital (17.6%) and four patients early discharged from the hospital under the

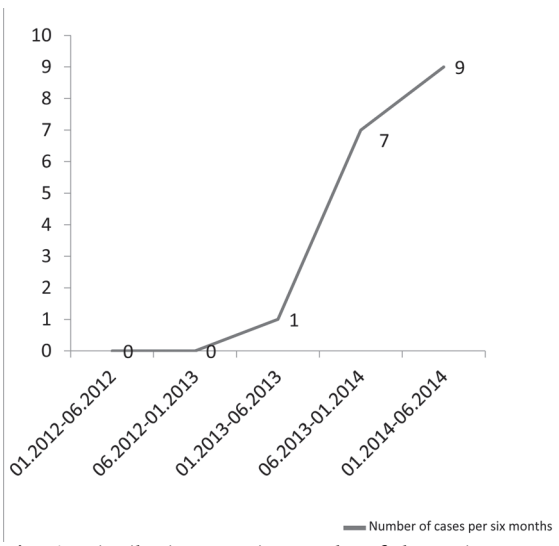

Fig. 1. Distribution per six months of the patients

Table I. Demografic Features of Patients, GCS:

Case No.	Gender	Patient age	Usage form	History of previus subctance abuse	Initial signs and symptoms	Physical examination on admission	GCS	Mental status on admission	Course	Treatment	Monitoring center
1	M	14	Inhalation	First	Syncope	Bilateral mydriasis	8	Unconscious		Supportive	Adolescent Psychiatry
2	F	16,5	Inhalation	First	Drug use	Agitation	15	Agitation	Dystonia	Supportive, Biperiden	Discharged with Police
3	F	16	Inhalation	First	Drug use	Agitation	15	Agitation		Supportive	Discharged with Police
4	M	15,5	Inhalation	Three months	Altered of consciousness	Normal	15	Normal		Supportive	Adolescent Psychiatry
5	F	17	Oral	First	Agitation	Agitation	15	Agitation		Supportive	Escaped
6	F	16	Inhalation	First	Drug use	Normal	15	Normal		Supportive	Discharged with Police
7	M	16,5	Oral	Two years	Drug use	Normal	15	Normal		Supportive	AMATEM
8	F	15	Inhalation	First	Vomiting	Normal	15	Normal		Supportive	AMATEM
9	M	15	Inhalation	First	Respiratory distress	Normal	15	Normal		Supportive	AMATEM
10	M	15	Inhalation	Three months	Numbness in hands	Normal	15	Normal		Supportive	AMATEM
11	M	15,5	Inhalation	Two years	Drug use	Normal	15	Normal		Supportive	AMATEM
12	F	17,5	Inhalation	Two years	Syncope	Letargy	9	Letargy		Supportive	Youth Center
13	M	17,5	Inhalation	Two months	Syncope	Normal	15	Normal		Supportive	Adolescent Psychiatry
14	F	16,5	Inhalation	Two months	Drug use	Normal	15	Agitation		Supportive	Discharged with Police
15	M	16	Inhalation	Five months	Altered of consciousness	Letargy	14	Letargy	Bradycardia	Supportive	AMATEM
16	F	13,5	Oral	First	Agitation	Agitation	15	Agitation		Supportive	Escaped
17	M	18	Inhalation	First	Suicide attempt	Unconscious, bilateral fixed,dilated pupils and loss of light reflex	8	Unconscious		Supportive	Escaped

GSC: Glascowe Coma Scale

surveillance of the police and upon the request of their families (23.6%) were not followed-up.

Discussion

The most important outcome of our study was that more than half of our cases applied to the pediatric emergency service without any complaint after the use of Bonzai and that approximately half of the cases used Bonzai for the first time. This situation shows us that Bonzai users are afraid of its effects although they use it and that numerous cases using the Bonzai for the first time demonstrate the increasing amplitude of its utilization.

Adolescents constitute an important risk group in terms of substance addiction. The risk of substance addiction in teenagers increases as a result of restless familial environment, lack of communication between parents and teenagers, relationship with friends using substances and approval of substance utilization in the environment[7]. Although the utilization of synthetic cannabinoid increases among adolescents today, there are limited studies focusing on this field in the literature within our knowledge. The information about the effects of the use of synthetic cannabinoid on adolescents is based on the case reports. The results obtained from the study carried out by Castellanos et al.[4] in 2011 about the psychoactive and physical effects of the use of synthetic cannabinoid in 11 adolescent cases were found to be compatible with the studies conducted on the adults.

Average age of the patients included in our study was 16 ± 1.27, and it was compatible with the average age recorded in the study of Castellanos et al.[4]. This consequence supports the idea indicating that the utilization of Bonzai is widespread among adolescents. Synthetic cannabinoids can be used orally or through inhalation[8]. In our study, most of the cases indicated the utilization of Bonzai through inhalation. Thus, Bonzai may be perceived like cigarettes in following periods and that its utilization may become more common.

In the literature, it has been shown that the effects of synthetic cannabinoids are more potent than those of natural cannabinoids[1]. Moreover, they have physical and psychoactive effects. Those effects are nausea, vomiting, dry mouth, shivering, sweating, hypertension, tachycardia, myocardial infarction, positive and negative mood changes and alterations in consciousness, agitation, sedation, and psychosis. Even cardiac arrest and death were reported in adults[8-10]. The stated complaints of our patients were syncope, vomiting, numbness and spasms in hands, and altered state of consciousness; they were compatible with the effects reported in adults.

There are few studies identified regarding the psychiatric effects of synthetic cannabinoids including suicidal ideation. Case 17 found while trying to jump on the train tracks with suicidal ideation. A 20-year-old healthy male with no previous psychiatric diagnoses who was brought to the ED with suicidal ideation and self-inflicted trauma after smoking synthetic cannabinoid was described[11].

Carson et al.[1] indicated that abnormal findings of physical examination of the cases were flushing, mydriasis in pupils, hyperreflexia, agitation and somnolence in the series consisting of six cases with an age range of 19-22. Two adolescent patients also developed tachycardia, hypertension, and somnolence after synthetic cannabinoid ingestion[1,9]. In our study, abnormal psychoactive effects of the cases were determined to be euphoria and agitation while the findings of physical examination were lethargy, loss of consciousness, mydriasis in pupils and ineffectiveness of bilateral light reflexes. Differently to the literature, dystonia developed in one case (Case no 2) after the utilization of synthetic cannabinoid, and bradycardia was observed in one case (Case no 15) contrary to expectations. Because of insufficient information about contents and doses of these substances, new developing effects due to Bonzai may not be predicted.

The elevations of blood urea nitrogen, creatinine and creatinine kinase subsequent to the use of synthetic cannabinoid were reported in the literature. Abnormal values were not detected in complete blood count, liver and kidney function tests, venous blood gases and cardiac markers of our cases[9-12]. It was considered that the normality of blood values of the cases could be related to the lack of knowledge about synthetic cannabinoid concentration in vegetal mixtures taken through inhalation.

It was observed that certain patients left the hospital as a result of their unwillingness to

compete the recommended observation period in the hospital, that some of the patients escaped from the hospital, and that a number of patients were discharged upon the request of their families. This may be related to the loss of ability to decide logically in consequence of the alterations seen in consciousness of the patients. Moreover, the avoidance of families from social pressures may result from insufficient knowledge of parents and the youth about the effects and hazards of synthetic cannabinoids.

The cases that completed the observation period in emergency service were directed to different centers. This reveals a need for an algorithm regarding the approach towards the patients using Bonzai and the parameters that should be evaluated in the emergency services.

The limitations of our study are the fact that educational and income levels, frequency of utilization, environment and social and economic problems influencing the families have not been questioned. Also the contents and concentration of synthetic cannabinoids in Bonzai are not known.

The majority of the cases apply to the emergency services and their detailed histories cannot be recorded due to the intense workload and crowding. Therefore, it is necessary to determine an algorithm and evaluation parameters that may be used in the emergency services. Although medical interventions were not highly required in our cases, serious clinical presentations such as renal failure, myocardial infarction and cardiac arrest were reported in the literature. Therefore, pediatric emergency physicians should be prepared for Bonzai utilizations which are being more common day by day.

REFERENCES

1. Harris CR, Brown A. Synthetic cannabinoid intoxication: a case series and review. J Emerg Med 2013; 44: 360-366.
2. Gurdal F, Aisrdizer M, Aker RG, et al. Review of detection frequency and type of synthetic cannabiboids in herbal compounds analyzed by Istanbul Narcotic Department of the Council of Forensic Medicine, Turkey. J Forensic Leg Med 2013; 20: 667-672.
3. Sun X, Dey SK. Synthetic cannabinoids and potential reproductive consequences. Life Sci 2014 27; 97: 72-77.
4. Castellanos D, Singh S, Thornton G, Avila M, Moreno A. Synthetic cannabinoid use: a case series of adolescents. J Adolesc Health 2011; 49: 347-349.
5. Akgül A, Aşıcıoğlu F. Uyuşturucu maddelerde yeni trendler ve erken uyarı sistemi. İçinde: Demir OÖ, Sever M, (eds). Örgütlü Suçlar ve Yeni Trendler. Ankara: Polis Akademisi Yayınları, 2011: 29-56.
6. http://www.tuik.gov.tr/PreHaberBultenleri.do?id=16121 (Accessed September 9, 2014).
7. Gürol DT, Madde Bağımlılığı açısından riskli adölesanlar. İstanbul Üniversitesi Cerrahpaşa Tıp Fakültesi Sürekli Tıp Eğitimi Etkinlikleri, Adölesan Sağlığı II Sempozyum Dizisi 2008; 63: 65-68.
8. Williams MM, Taylor PJ, Page CB, Martin JH. Clinical research in synthetic cannabinoids - do we need a national approach? Med J Aust 2014; 201: 317-319.
9. Heath TS, Burroughs Z, Thompson AJ, Tecklenburg FW. Acute intoxication caused by a synthetic cannabinoid in two adolescents. J Pediatr Pharmacol Ther 2012; 17: 177-181.
10. Ibrahim S, Al-Saffar F, Wannenburg T. A Unique case of cardiac arrest following K2 abuse. Case Rep Cardiol 2014; 2014: 120607.
11. Thomas S, Bliss S, Malik M. Suicidal ideation and self-harm following K2 use. J Okla State Med Assoc 2012; 105: 430-433.
12. Buser GL, Gerona RR, Horowitz BZ, et al. Acute kidney injury associated with smoking synthetic cannabinoid. Clin Toxicol (Phila) 2014; 52: 664-67.