Cannabidiol Oil for Decreasing Addictive Use of Marijuana: A Case Report

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Abstract

This case study illustrates the use of cannabidiol (CBD) oil to decrease the addictive use of marijuana and provide anxiolytic and sleep benefits. Addiction to marijuana is a chronic, relapsing disorder, which is becoming a prevalent condition in the United States. The most abundant compound in the marijuana, which is called tetrahydrocannabinol (THC), has been widely studied and known for its psychoactive properties. The second most abundant component—CBD—has been suggested to have the medicinal effects of decreasing anxiety, improving sleep, and other neuro-protective effects. The mechanism of action for CBD has been suggested to be antagonistic to the psychoactive properties of THC in many locations within the central nervous system. Such action raises the issue of whether it might be beneficial to use CBD in isolation to facilitate withdrawal of marijuana use. The specific use of CBD for marijuana reduction has not been widely studied.

The patient was a 27-y-old male who presented with a long-standing diagnosis of bipolar disorder and a daily addiction to marijuana use. In the described intervention, the only change made to the patient's treatment was the addition of CBD oil with the dosage gradually decreasing from 24 to 18 mg. With use of the CBD oil, the patient reported being less anxious, as well as settling into a regular pattern of sleep. He also indicated that he had not used any marijuana since starting the CBD oil. With the decrease in the dosage to 18 mg, the patient was able to maintain his nonuse of marijuana.

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Cannabidiol (CBD) oil is a naturally occurring constituent of industrial hemp and marijuana collectively called cannabis. CBD oil is one of at least 85 cannabinoid compounds found in cannabis and is popular for its medicinal benefits. After tetrahydrocannabinol (THC), which is the most abundant compound in cannabis, CBD is the second most abundant. Other names for CBD oil include CBD-rich hemp oil, hemp-derived CBD oil, or CBD-rich cannabis oil. CBD is generally considered to be safe and has been used medicinally for decades. The suggested medicinal effects of CBD include decreasing anxiety, improving sleep, and providing other neuroprotective effects.

THC is a cannabinoid and is the component that induces the euphoric psychoactive effect. Various cannabis plants can have different amounts of CBD and THC depending on the strain, and, thus, can provide different recreational or medicinal effects. The cannabinoid profile of industrial hemp or medical marijuana is ideal for people looking for the medical benefits of CBD without the high of the THC. The mechanism of action for CDB has been suggested to be antagonistic to the psychoactive properties of THC in many locations within the central nervous system, thus helping to attenuate the psychoactive behaviors of THC.[1,2]

The mechanism of action of CBD is multifold.[3,4,5] Two cannabinoid receptors are known to exist in the human body: CB_1 and CB_2 receptors. The CB_1 receptors are located mainly in the brain and modulate neurotransmitter release in a manner that (1) prevents excessive neuronal activity, thus calming and decreasing anxiety; (2) reduces pain; (3) decreases inflammation; (4) regulates movement and posture control; and (5) controls sensory perception, memory, and cognitive function.[4]

Anandamide, an endogenous ligand that occurs naturally within our bodies, binds to the CB_1 receptors through the G-protein coupling system. CBD has an indirect effect on the CB_1 receptors by stopping the enzymatic breakdown of anandamide, allowing it to stay in the system longer and to provide its medical benefits.[6] CBD has a mild effect on the CB_2 receptors, which are located in the periphery of the lymphoid tissue. The CBD helps to mediate the release of cytokines from the immune cells in a manner that helps to reduce inflammation and pain.[4]

Other mechanisms of action of CBD include stimulation of vanilloid pain receptors, such as the transient receptor potential cation channel subfamily V member 1 (TRPV-1) receptor, which are known to mediate pain perception, inflammation, and body temperature.[7] CBD may also exert its antianxiety effects by activating adenosine receptors that play a significant role in cardiovascular function, causing a broad anti-inflammatory effect throughout the body.[7] At high concentrations, CBD directly activates the $5\text{-}HT_{1A}$ serotonin receptor, thereby conferring an antidepressant effect.[8] CBD has been found to be an antagonist at a potentially new third cannabinoid receptor (ie, G protein-coupled receptor 55, or GPR55), which resides in the caudate nucleus and putamen and can contribute to osteoporosis when stimulated.[9]

Since the 1940s, a considerable number of published articles have addressed the chemistry, biochemistry, pharmacology, and clinical effects of CBD.[10] The last decade has shown a notable increase in the scientific literature on CBD, owing to its identification as being beneficial in reducing nausea and vomiting, combating psychotic disorders, decreasing inflammation, lessening anxiety, reducing depression, improving sleep, and increasing a sense of well-being.[11,12,13,14] Findings presented at the 2015 International Cannabinoid Research Society at their 25th Annual Symposium in Nova Scotia, Canada, reported that use of CBD was beneficial for treatment of liver fibrosis and inflammation, metabolic syndrome, overweight and obesity, anorexia/cachexia syndrome, and osteoarthritic and other musculoskeletal conditions.[15]

Although studies have demonstrated the calming, anti-inflammatory, and relaxing effects of CBD, clinical data demonstrating the use of CBD to obtain help in marijuana withdrawal is minimal. One prior case study by Crippa et al[16] documented the positive effects of using CBD for the treatment of marijuana withdrawal. The current case study offers further evidence that CBD is effective as a safe method of transitioning off marijuana without unwanted side effects.

Presenting Concerns

The patient was a 27-year-old male who presented with a long-standing diagnosis of bipolar disorder and a daily addiction to marijuana. His presenting concerns included erratic behaviors, anxiety, inconsistent sleep patterns, and irritability. He currently lives with his parents, works as a self-employed driver, and teaches chess to children. Informed consent was received from the patient.

Clinical Findings

The patient's history included hospitalizations as a teenager for bipolar episodes. He came to the author's clinic, Wholeness Center in Fort Collins, Colorado, in 2011 and was evaluated by a psychiatrist and naturopathic physician.

The patient's treatments for his bipolar disorder included pharmacological medications (Table 1). Evaluations included (1) a basic, complete blood count; (2) a nutritional evaluation; (3) a comprehensive metabolic panel; (4) a lipid panel; (5) a measurement of methylene tetrahydrofolate reductase (MTHFR); (6) a celiac panel; (7) a measurement of thyroid function; (8) a measurement of iron levels; and (9) a quantitative electroencephalogram (qEEG).

Dietary recommendations were then implemented as was a regimen of nutritional supplements. The patient also received neurofeedback sessions and bodywork. Prior to the period of the case study, he had been stable for a number of years.

In time, the patient's marijuana habit progressed to addiction. In May 2015, it was recommended that he begin taking CBD as a way of transitioning off the daily marijuana use and stabilizing his erratic moods.

Diagnostic Focus and Assessment

Clinical observations of the patient's erratic behaviors, mood swings, and disorientation, together with the patient's self-report of daily marijuana use, reinforced the diagnoses of bipolar disorder and addiction. He was administered the Pittsburgh Sleep Quality Index (PSQI)[17] and the Hamilton Anxiety Rating Scale (HAM-A)18 prior to initiation of the CBD oil.

Theraputic Focus, Assessment, and Follow-up

The only addition that the author made to the patient's treatment regime was the CBD oil. At the same time, the patient's other supplement therapy was discontinued to simplify treatment, as no clear benefit was demonstrated. The initial regimen was 24 mg of the CBD oil, with 6 sprays PRN during the day and 2 sprays QHS. The dosage was gradually decreased from 24 to 18 mg, with the patient using no sprays during the day and 6 sprays at bedtime. The patient was seen for monthly appointments, including readministration of the PSQI and the HAM-A to evaluate the effectiveness and proper dosing of the CBD oil. CannaVest Company (Las Vegas. NV, USA), which had no involvement in the case study or distribution of the product, provided the CBD oil that was administered to the patient.

Table 1. Patient's Timeline, 2011-2015

Date	Presentation	Medications	Supplements	Cannabidiol Oil
06/20/2011	Initial psychological evaluation; diagnosis of bipolar disorder and depression, with difficulty processing information; buzzing in head and some disorientation; 2 manic periods in previous 10 mo, exacerbated by substance abuse; history of hospitalizations; micromanagement of life by mother.		Regular marijuana use	
11/2011-06/2012	49 neurofeedback sessions.		Marijuana use	
08/2012-10/2012	9 bodywork sessions.		Marijuana use	
10/22/2013	No periods of mania/depression; 2 jobs.		Marijuana use	
02/21/2014	Erratic moods with resumption of THC; stressed family with patient's deterioration when using THC.	Citalopram: 20 mg	Marijuana use daily	
03/27/2014	Mood withdrawn and erratic; passive-aggressive behaviors.	Citalopram: 20 mg Lamotrigine: 150 mg	Marijuana use: 1-2 joints /night + pot brownies; admitted addiction to THC DEN: 3 caps TID Niacin: 2 caps BID O-3: 1 cap/d CoQ_{10}: 150 mg/d Inositol: 2 scoops AM & PM Probiotic: 1 cap/d Meriva: 1 cap/d	
05/08/2014	Contemplation of quitting THC; realization of connection with mood changes; concern of family about mood changes; limited social contact; works with Legos.	Citalopram: 20 mg Lamotrigine: 150 mg	Regular marijuana use DEN: 3 caps TID Niacin: 2 caps BID O-3: 1 cap/d CoQ_{10}: 150 mg/d Probiotic: 1 cap/d	

Table 1. (continued)

Date	Presentation	Medications	Supplements	Cannabidiol Oil
07/10/2014	Less labile; mildly tired; no psychosis; continued marijuana use; less tension at home, with father home more often.	Citalopram: 20 mg Lamotrigine: 150 mg Deplin: 15 mg	Marijuana use 1 ×/wk DEN: 3 caps TID Niacin: 2 caps BID O-3: 1 cap/d CoQ_{10}: 150 mg/d	
04/24/2015	Continuous destabilization; no evidence of psychosis; difficulty with abuse of marijuana; jobs teaching chess to kids and catering.	Citalopram: 20 mg Lamotrigine: 150 mg Deplin: 15 mg	Marijuana use daily DEN: 3 caps TID Niacin: 2 caps BID O-3: 1 cap/d CoQ_{10}: 150 mg/d	
05/04/2015	Anxious, erratic moods; sensitive to gluten but no restriction; consumption of a lot of junk food; jobs teaching kids chess, making deliveries.	Citalopram: 20 mg Lamotrigine: 150 mg Deplin: 15 mg	No marijuana No supplements	6 sprays PRN during day; 2 sprays QHS
06/04/2015	Overall improved quality of sleep; slightly less anxious.	Citalopram: 20 mg Lamotrigine: 150 mg Deplin: 15 mg	No marijuana No supplements	3-4 sprays PRN during day; 6 sprays QHS
07/02/2015	Overall doing well; better sleep; anxiety under control; new job as Uber driver.	Citalopram: 20 mg Lamotrigine: 150 mg Deplin: 15 mg	No marijuana No supplements	2 sprays PRN during day; 4 sprays QHS
08/03/2015	Overall good sleep and no anxiety.	Citalopram: 20 mg Lamotrigine: 150 mg Deplin: 15 mg	No marijuana No supplements	0 sprays PRN during day; 6 sprays QHS

Abbreviations: THC, tetrahydrocannabinol; DEN, daily essential nutrients; cap(s), capsule(s); TID, 3 ×/d; BID, 2 ×/d; THC, tetrahydrocannabinol; PRN, when necessary; QHS, every bedtime.

Outcome Measures

Pittsburgh Sleep Quality Index. The PSQI is a standardized and validated self-report instrument that measures sleep quality over the prior month. Low scores indicate better sleep. A score under 5 means that you have no sleep concerns. 5 to 10 is fair quality sleep.

Hamilton Anxiety Rating Scale. The HAM-A scale is a standardized and validated measure of anxiety in an adult population that has been in active use for decades. A score of 17 or less indicates mild anxiety in terms of severity. A score from 18 to 24 demonstrates mild to moderate anxiety severity. Last, a score of 25 to 30 indicates moderate to severe anxiety.

Results

Using the CBD oil, the patient was able to maintain nonuse of marijuana. With a subsequent, gradual decrease in anxiety, the patient was able to maintain a regular sleeping schedule (Table 2). He was able to get a more secure job as a self-employed driver, and he continued to teach chess to children. He also became more interactive with his family and friends.

Table 2. Patient Sleep

Date	PSQI	HAM-A
05/4/2015	7	16
06/4/2015	8	8
07/2/2015	7	6
08/3/2015	7	5
09/10/2015	8	4

Abbreviations: PSQI, Pittsburgh Sleep Quality Index; HAM-A, Hamilton Anxiety Rating Scale.

Discussion

The current case study found that CBD oil can be an effective compound to use for transitioning an individual off addictive use of marijuana. The fact that no changes were made in the patient's medication schedule, diet, or lifestyle gives credence to the idea that the results were the actual effects of the CBD oil.

A possible weakness of the study is the fact that the patient's total nonuse of marijuana was self-reported, and the reliability of his reporting could be suspect. However, the patient made significant gains in taking responsible actions and presented fewer erratic and disorganized behaviors.

A systematic review of the literature previously had examined 14 studies on the use of CBD oil to modulate various neuronal circuits involved in drug addiction.[19] That review suggested that CBD "may have therapeutic properties on opioid, cocaine, and psychostimulant addictions ... and may be beneficial in cannabis addiction in humans." The current case study seems to support that review's conclusions.

One reported consequence of the cessation of daily marijuana use is a withdrawal syndrome that is characterized by irritability, anxiety, marijuana craving, decreased quality and quantity of sleep, and reduced food intake.[16,20] The use of the CBD oil in transitioning the current patient off the marijuana allowed him to avoid experiencing those side effects, as was demonstrated by his behavior and scores on the PSQI and HAM-A screening tools.

Patient Perspective

The patient reported being less anxious and sleeping better since taking the CBD oil. He reported not using any marijuana since starting the CBD and was proud of his accomplishment of getting a job as a self-employed driver and continuing with teaching chess to children.

Author Disclosure Statement

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