MARIJUANA: AN IN-DEPTH LOOK AT ITS USE, CAUSE, AND EFFECTS IN MEDICAL APPLICATIONS.

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ABSTRACT

Marijuana has been used for decades, and in recent years, interest in its medical qualities has grown. Cannabinoid medications such as dronabinol, nabilone, and nabiximols have been developed as a result of research into their therapeutic characteristics. Marijuana use disorder is becoming more common among marijuana users. Marijuana is an illegal narcotic that is becoming increasingly popular among teenagers and young people, and it is harmful to human health. This review examines the most common concerns that individuals have concerning marijuana use and its impact on human health. The review focuses on the consequences and severity of the effects on human living, including physical, mental, emotional, and behavioral changes. According to this study, the most often used illicit substance (marijuana) has an active ingredient called delta-9-tetrahydrocannabinol (THC), which causes mind-altering effects. THC, the main element in marijuana, goes throughout the body, including the brain, to generate its numerous effects when smoked. THC binds to receptors known as cannabinoid receptors. THC binds to cannabinoid receptors on nerve cells in the brain, altering their function. "Are there treatments for marijuana abusers?" and "Can marijuana be used as a type of medication in humans?" are two of the concerns discussed.

Keywords: marijuana, sensation-seeking, THC, health outcomes, psychiatric, disorders

INTRODUCTION

With the rising availability of medical and recreational marijuana also known as Cannabis, there has been worry over whether greater marijuana availability will have unexpected repercussions for young people who use marijuana before they become adults. Marijuana is quite popular all over the world, and it is still the most often used illicit substance among young people in the United

States. According to the most recent annual national surveillance data from the United States, 44 percent of high school seniors have used marijuana at some point in their lives, more than one-third of seniors have used marijuana in the last year, and more than one-fifth of seniors have used marijuana in the last 30 days [1]. Cannabinoids, the biologically active components of cannabis, and their interaction with cannabinoid receptors are responsible for the effects of cannabis and its synthetic variations. Cannabis is most often obtained from the Cannabis indica and Cannabis sativa plants, both for recreational and medical applications (family: Cannabaceae). The two most significant ligands at cannabinoid receptors, tetrahydrocannabinol (THC) and cannabidiol (CBD), are found in both of these plants, but the amount of cannabinoid content is thought to differ. THC and CBD are the most often used ligands in cannabis for medical purposes [2].

Figure 1. *Cannabis Sativa*

Cannabis has a variety of mental and physical effects, including euphoria, altered states of mind and sense of time, difficulty concentrating, impaired short-term memory, impaired body movement, and an increase in appetite. When smoked, the effects are felt immediately, but when eaten, it can take up to 90 minutes [3]. Depending on the dosage, the effects can last anywhere from two to six hours. Anxiety, delusions, hallucinations, panic, paranoia, and psychosis can all occur at high doses. There is a strong link between cannabis use and the risk of psychosis, though the direction of causality is debatable [4]. In children whose mothers used cannabis during pregnancy, physical effects include increased heart rate, difficulty breathing, nausea, and behavioral problems. Dry mouth and burning eyes are other possible short-term adverse effects. Addiction, decreased mental ability in those who began regular use as adolescents, chronic

coughing, susceptibility to respiratory infections, and cannabinoid hyperemesis syndrome are all possible long-term side effects [5].

MODES OF CANNABIS CONSUMPTION

Cannabis can be ingested in a variety of methods, all of which require heating to decarboxylate the plant's THCA into THC. The following are examples of commonly available forms:

1. Smoking - Small pipes, bongs (portable versions of hookahs with a water chamber), paper-wrapped joints or tobacco-leaf-wrapped blunts, and other things are commonly used to burn and inhale vaporized cannabis ("smoke") [6].
2. Vaporizing - which raises the temperature of any type of cannabis to 165–190 °C (329–374 °F), causing the active components to evaporate into vapor without burning the plant material (under atmospheric pressure, THC's boiling point is 157 °C (315 °F) [7].
3. Cannabis Tea - Because THC is an oil (lipophilic) and is only slightly water-soluble, it has relatively low quantities (with a solubility of 2.8 mg per liter). To make cannabis tea, combine a saturated fat (e.g., cream or any milk except skim) with a tiny amount of cannabis in hot water [8].
4. Edibles are cannabis products that are mixed into a range of foods, such as butter and baked pastries. Bhang, a popular beverage in India, is created from it. Green dragon tincture, often known as cannabis tincture, is an alcoholic cannabis concentrate.
5. Capsules and other dietary supplement items containing cannabis oil, of which 220 were approved in Canada in 2018 [9].

Delta-9-tetrahydrocannabinol

THC has high lipophilicity and is insoluble in water. Inhaled marijuana smoke rapidly absorbs into the bloodstream, with plasma levels measurable in seconds and peak plasma levels in less than 10 minutes. Peak plasma levels are proportional to the amount of THC in the marijuana consumed. THC bioavailability from marijuana smoking varies depending on the depth of inhalation, puff, and breath-holding duration, and is reported to range from 10% to 35%, with heavy users having a higher systemic bioavailability than infrequent users. Because less THC is lost in sidestream smoke when marijuana is smoked using a pipe rather than a cigarette, it can result in more THC absorption. THC levels peak in 6 to 10 minutes after marijuana is smoked, while 11-OH-THC

levels peak in 9 to 23 minutes. Maximum psychotropic effects start 20 to 30 minutes after inhalation and lasts 45 to 60 minutes or longer, depending on the THC content of the marijuana [10].

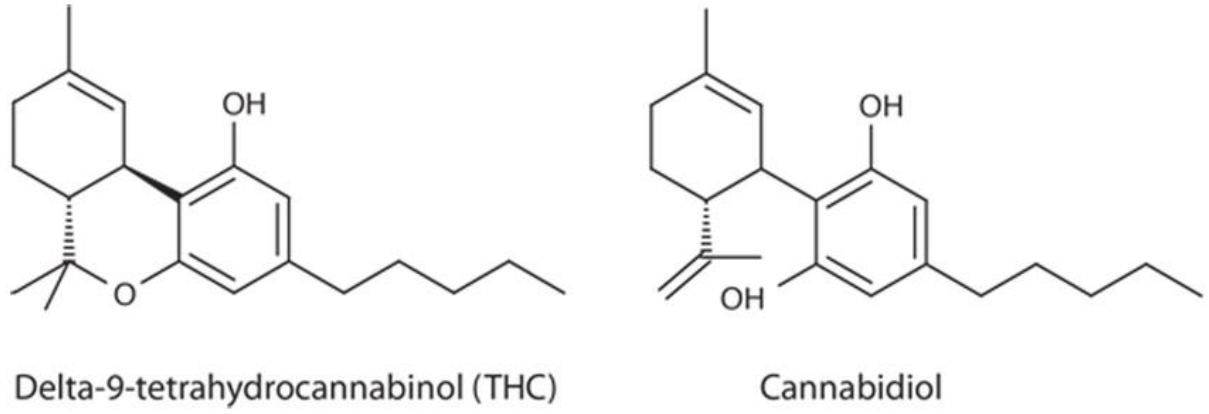

Figure 2. *Delta-9-tetrahydrocannabinol*

Cannabinoids' high lipid solubility allows them to stay in the body for long periods. THC can be detected in the body for weeks or longer after a single dosage (depending on the amount administered and the sensitivity of the assessment method). Cannabinoids may accumulate in the body, particularly in the lipid membranes of neurons, according to researchers [11]. THC's main effects are mediated by two types of cannabinoid receptors, the CB1 receptor, and the CB2 receptor, both of which are G protein-coupled receptors, according to researchers [12]. The CB1 receptor is generally found in the brain, but it is also expressed in neuroglial cells. The CB2 receptor is primarily found in peripheral tissues, but it is also expressed in neuroglial cells. THC appears to affect mood and cognition via acting as an agonist on CB1 receptors, which block a secondary messenger pathway (adenylate cyclase) dose-dependently. THC boosts dopamine release and provides psychotropic effects by activating CB1 receptors [13]. The effects of THC on the glycine receptors are also amplified. It's unclear whether or not these behaviors contribute to the problem [14].

ADVERSE EFFECTS OF MARIJUANA

Physical Effect

While marijuana does not appear to have any major chronic lung effects, long-term marijuana usage can cause respiratory difficulties. It has been discovered that smoking marijuana increases

the risk of airway blockage, bronchitis, and airway damage such as edema (Tashkin et al. 2002). Tashkin et al. (2002) found a link between regular marijuana use and bronchitis symptoms such as cough, sputum production, and wheezing in a review of the literature. Regular marijuana use can also cause dysregulated bronchial epithelial cell proliferation, and marijuana smoke contains carcinogenic and co-carcinogens, all of which can contribute to the development of lung cancer [10].

Psychological Effects

According to current scientific evidence, cannabis is the most common psychoactive product after tobacco and alcohol. Repeated use of cannabis, like many other psychoactive substances, can lead to tolerance and, eventually, addiction. As a result, one out of every six persons who used cannabis throughout adolescence will acquire cannabis dependency, and nine percent of those who used cannabis will develop cannabis addiction [11]. Furthermore, increased cannabis use was linked to a higher chance of disorder occurrence and prevalence [12]. A vast body of evidence suggests that, in addition to addiction, cannabis use, both acute and chronic, is linked to psychiatric illnesses. Cannabis may cause or exacerbate manic symptoms in patients who have been diagnosed with bipolar illness [13].

Chronic bronchitis

Cough, wheezing, sputum production, and dyspnea are all symptoms of cannabis use, just as they are with tobacco. Current cannabis smokers reported a higher incidence of these symptoms than non-smokers in a recent meta-analysis of observational studies [14]. Cough was twice as common and sputum production was four times more common in cannabis smokers in the two prospective investigations. For nearly ten years, Tashkin et al. followed up on a convenience sample of adult volunteers [15]. Those who continued to consume cannabis were more likely than non-smokers to develop chronic bronchitis symptoms during follow-up, whereas those who discontinued smoking were not. In a population-based cohort of people aged 18 to 38 years, Hancox et al. regularly inquired about respiratory symptoms among cannabis users and non-users [16]. non-cannabis users showed a substantially higher prevalence of morning cough, sputum production, wheeze, and dyspnoea on exertion than those who used cannabis at least weekly. Cough, sputum output, and wheezing symptoms improved in those who stopped using cannabis frequently, but persisted or grew more common in those who continued [17].

Dependence syndrome

THC tolerance develops in animals after repeated doses, and research suggests that cannabinoids may activate the equal reward systems as liquor, cocaine, and opioids [18]. Heavy cannabis users increase susceptibility to its subjective and cardiovascular effects, and some have withdrawal symptoms when they stop using the drug abruptly [18-19]. There is evidence that extensive chronic cannabis use leads to a cannabis dependence syndrome in people who have trouble limiting their use and who continue to use the drug despite negative personal consequences. There is some clinical evidence of a dependent syndrome similar to that which exists with alcohol [20]. Cannabis addiction is one of the most common kinds of illegal substance addiction in the United States. Approximately one out of every ten people who have ever used cannabis becomes addicted to it at some point during their 4 or 5 years of heavy use. This risk is closer to that of alcohol (15%) than nicotine (32%), or opioids. (23 percent) [20].

Severity	**Adverse Effects**
1	Induced respiratory problems
2	Psychiatric symptoms and disorders
3	Impaired executive functioning
4	Impaired processing speed
5	Lower academic achievement
6	Poor job performance
7	Impaired social functioning in relationships
8	Impaired driving ability
9	Increased chances of other illicit drug use

Table 1. *Adverse effects of marijuana use in descending order of severity.*

NABIXIMOLS (SATIVEX®)

Use in Multiple Sclerosis

Nabiximols (Sativex) is an oromucosal cannabis spray that has been licensed for use as an add-on medication to relieve spasticity in MS patients in Canada and many European nations. It has a 1:1 THC: CBD ratio, with the THC component acting as a partial agonist of the CB1 and CB2 receptors and the CBD component acting as an antagonist. Each spray contains 2.7 milligrams of THC and 2.5 mg of CBD and is intended to be applied to the buccal mucosa. MS patients utilize an average of eight sprays per day, with a daily dose of no more than 12 sprays suggested [15]. Yadav et al. found nabiximols to be helpful as a complementary and alternative medicine (CAM) for treating MSS symptoms in a 2014 study. Because of its success in treating MSS, nabiximols are now being studied for use in treating other types of spasticity, such as post-stroke syndrome [21].

Marijuana in Parkinson’s diseases

In the United States, Parkinson's disease (PD) is the second most frequent neurodegenerative condition of adult-onset. It is a severe disease that manifests itself in both motor and non-motor symptoms. Both motor and non-motor symptoms, such as bradykinesia, stiffness, tremor, sleep, and pain, are improved by medical marijuana. The effects of cannabis on 85 people with Parkinson's disease were revealed in a study. Along with their prescribed PD medication, the majority of them consumed half a teaspoon of cannabis leaves. About 46% of these people reported alleviation from PD symptoms in general, with relief arriving on average 1.7 months after the initial use of marijuana, implying that chronic marijuana usage may be required for symptom improvement [22].

An adverse effect of Marijuana on Parkinson’s diseases

Marijuana's side effects include cognitive deficits, which are only transient and disappear as the substance is stopped. Marijuana is well documented for impairing working memory and for having a favorable correlation with depression. Another potential negative effect of marijuana is weight gain, as the drug is known to enhance calorie consumption. It's been hypothesized that acute

marijuana use can induce a transitory motivated mood in non-users, but that continuous marijuana usage avoids this [23].

Treatment of Appetite Disorders and Weight Loss

In studies of healthy individuals, smoking marijuana increased calorie intake. Individuals with HIV have been studied for the impact of smoked marijuana on appetite. Patients in HIV-positive clinics who use marijuana say it helps with hunger and nausea [24]. In a limited study of older adults with suspected Alzheimer's disease, dronabinol improved food intake and reduced agitation [25].

An overview of cannabis's negative consequences

Acute Effects

- Anxiety and panic, particularly in new users.
- While inebriated, impaired attention, memory, and psychomotor function.
- If a person drives a car when inebriated with cannabis, especially if cannabis is combined with alcohol, there may be an increased chance of an accident.
- Those who are vulnerable due to a personal or familial history of psychosis are at a higher risk of developing psychotic symptoms.

Chronic Effects

- Chronic bronchitis and histological alterations that could indicate the onset of malignant illness.
- A cannabis addiction syndrome characterized by an inability to manage or refrain from cannabis use.
- Subtle attention and memory problems that continue while the user is chronically drunk and may or may not be recoverable after a period of sobriety.

Negative consequences that could occur (to be confirmed)

- Increased risk of the oral cavity, pharyngeal, and esophageal malignancies, as well as leukemia in kids exposed in utero.

- In occupations requiring high-level cognitive skills, adolescent educational success is impaired, and adults underachieve.

Conclusion

Further study has given us a greater understanding of how cannabis may provide therapeutic benefits to patients, thanks to the shift in legislation in the United States and other nations toward recognition of the medicinal use of cannabis. Furthermore, the identification of the molecular pathways by which these benefits are obtained has led to the ongoing development of cannabis-derived pharmaceuticals that may provide focused therapeutic benefits without side effects. Epidiolex is one such molecule that, by isolating CBD from the cannabis plant, eliminates the psychoactive effects of cannabis consumption. It is currently accessible in the United States. Ongoing medication development promises to benefit from a tailored endocannabinoid receptor agonism approach for the therapy of chronic pain problems in this relatively young sector of pharmaceutical development. Despite this, the available evidence's overall quality and clinical importance are both low. As a result, it's tough to provide a firm recommendation. in support of normal clinical practice Until then, cannabinoid-based medications will be used. More clinical trials are being conducted.

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