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Major:
Psychology

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Medical Cannabis Treatments

Biography

Ariana Esfahani is a third-year Psychology major at San José State University. She is interested in pursuing a Clinical Psychology degree to own her private practice in the future. Her goal in her academic college career is to find effective treatments for individuals diagnosed with mental health disorders or autism spectrum disorder. She has a passion for working with children and adults to improve their quality of life.

She was awarded the President's Scholars Award for receiving a 4.0 GPA in Spring 2021. Furthermore, Ariana was recognized for her research studies and was granted the Outstanding Undergraduate Research Scholarship for Fall 2022. In addition to her recent accomplishments, she was invited to present her research studies at the National Conference of Undergraduate Research (NCUR) and the Spartan Psychological Association of Research (SPARC).

As Ariana pursues her Bachelor's in Psychology, she will be working as a Senior Behavior Technician Manager at the Autism Impact Circle company. She enjoys applying her leadership skills through her job while providing 1:1 therapy for children with disabilities. Outside of work, she volunteers for the suicide hotline to help navigate LGBTQ+ youth through challenging times and to prevent suicide.

Medical Cannabis Treatments

Abstract

This research report examines past research studies on marijuana therapy interventions involving individuals who have Autism Spectrum Disorder, Epilepsy, and Tourette's Syndrome. These results do not ensure marijuana as a permanent method to cure adverse symptoms for these vulnerable populations. However, these large-scale studies have shown a trend of marijuana being effective for some participants involved in decreasing and/or improving their symptom frequency. This report will contribute to the knowledge pool on the safety and effectiveness of marijuana therapy.

Introduction

Many research studies have investigated the effects of medical marijuana on patients with neurobehavioral disorders. Other areas of medical marijuana treatment are used in patients with chronic pain, depression, and cancer. This literature review will be focusing on the results of the therapy interventions for patients with Autism Spectrum Disorder (ASD), Epilepsy, and Tourette's Syndrome. Marijuana treatment can improve the quality of life for these patients who struggle with uncontrollable impulsive behavior, anxiety, self-injury, aggressiveness, and seizures. Unfortunately, since marijuana is classified as a schedule 1 drug under the federal government, it is looked down upon as a form of medical treatment.

Medical Marijuana Effects on Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is a form of neurodivergence that is still insufficiently understood. Research studies have investigated the effects of medical marijuana on ASD patients. These studies will be comparing two studies and the results they find on the safety and utilization of marijuana on ASD patients. The terms discussed in this paper are the components of marijuana which are cannabidiol (CBD) and Δ^9 -tetrahydrocannabinol (THC). THC is known for its psychoactive effects directly affecting the central nervous system (Agarwal et al., 2019). THC affects things like appetite and cognitive function. In comparison, CBD is an anti-inflammatory component used to treat epilepsy and psychiatric disorders without the psychoactive effects (Agarwal et al.).

Schleider et al. (2019) collected data from 188 individuals on the ASD spectrum undergoing a cannabis treatment program. This study aimed to track the patient population receiving medical cannabis treatment and evaluate the therapy's safety (Schleider et al.). Subjects diagnosed with ASD ranging from ages under five to 18 years old were given cannabis oil to consume 3x a day orally (Schleider et al.). Most patients consumed oil containing 30% CBD and 1.5% THC (Schleider et al.). Researchers then gathered data from the study population in three follow-up periods

immediately after in-take, one month, and six months to see what changed between the patients.

The study results indicated that a majority of the patients reported a better quality of life and a positive mood change after treatment (Schleider et al., 2019). Based on these results, we can conclude that the use of cannabis is, in fact, safe and well-tolerated. Schleider et al. stated that “patients who reported side effects of the treatment were moderate and easy to cope with.” Roughly 80% of the ASD research participants reported a significant/moderate behavior improvement.

Agarwal et al. (2019) reported a different study that collected data from 53 children diagnosed with ASD. These 53 children were prescribed oral cannabinoids that contained 16mg of CBD and 0.8mg of THC per serving (Agarwal et al.). The purpose of this study was to track the patient’s symptoms using bi-weekly interviews with parents (Agarwal et al., 2019). Patients before this study would deal with symptoms such as hyperactivity, sleep problems, and anxiety (Agarwal et al.). Data was collected based on the children’s symptoms and how they were affected by the cannabinoids, described as improvement, no change, or worsening (Agarwal et al.).

Agarwal et al. (2019) reported that 74.5% of the participants experienced an improvement in ASD comorbidity symptoms. Similarly, Schleider et al. (2019) reported even higher results being 80% significant improvement in behavior. Based on the results of Agarwal et al. and Schleider et al. studies, it can be concluded that oral medical marijuana treatment is a potentially safe method to improve patients’ symptoms of ASD. However, the studies’ similar limitations were that they lacked a control group. In the Schleider et al. study, the limitation was an observational study with no control group. Therefore, no causality between the cannabis treatment and improvement in patients’ wellbeing can be concluded (Schleider et al.). Agarwal et al. had the exact problem of having no control group and objective assessment tools. Therefore, we cannot conclude that medical marijuana was the reason for the improved symptoms. Still, it is a safe treatment due to the mild side effects reported from each study. Another limitation that both studies had was that they gathered information from the patient’s family and not from the patient

themselves. Some ASD patients could not vouch for themselves on how the treatment made them feel.

In conclusion, more evidence is needed to ensure that medical marijuana effectively treats ASD patients. Marijuana or any drug has not been discovered to cure the symptoms of ASD permanently. However, large-scale studies like the ones discussed in this review help build our knowledge of the safety and effects of cannabis on patients who have ASD. Future research on medical marijuana therapy for ASD patients could include control groups. More research under control groups can help researchers create a cause-and-effect relationship between marijuana and ASD symptoms.

Ethical Implications

Many families seek alternate treatment methods for their children with ASD (Duvall S et al. 2019). Complementary Health Approaches (CHAs) offers an array of health approaches outside mainstream medicine to treat core symptoms for ASD. Cannabis has been considered a potential CHA treatment method to help reduce severe ASD symptoms. Cannabis is legal in 33 states, while recreational marijuana is legal in 10 states. Oregon, for example, does not allow recreational use for anyone under 21 but has no age limit for medical use. Many may argue that giving pediatric patients marijuana is unethical, but there can be a new opportunity to accept this treatment by following regulations. The ethical criteria researchers should have their participants meet before they participate in marijuana therapy is to have a statement that verifies the diagnosis of their medical condition and certifies that the use of cannabis may migrate their symptoms (Duvall S et al.). The participants also must have a designated caregiver responsible for providing supervision while the therapy is ongoing (Duvall S et al.). If these criteria are followed, and studies that support that marijuana therapy reduce self-harm in patients with ASD, it would be considered unethical for a clinician to be against its use (Duvall S et al.)

Medical Marijuana effects on Tourette's Syndrome

Tourette's Syndrome (TS) is an inherited psychiatric symptom that involves involuntary motor and vocal tics that stay persistent for longer than one year (Abi-Jaoude et al., 2017). TS in some patients may involve other comorbidity symptoms such as obsessive-compulsive disorder (OCD), attention deficit hyperactivity disorder (ADHD), and rage attack (Abi-Jaoude et al.). Below are discussed studies that have been conducted on the effects of marijuana therapy on patients with TS.

Abi-Jaoude et al. (2017) conducted semi-structured interviews on the effects cannabis had on the patient's symptomatology of tics and comorbidities. 21/19 of the participants were willing to take part in the interview process. Abi-Jaoude et al. found that all 19 patients reported improving comorbid symptoms with cannabis, such as rage outbursts, sleep, attention, irritability, and obsessive-compulsive symptoms. Further results also showed that 18/19 patients decreased total tic severity (Abi-Jaoude et al.). Similarly, Müller-Vahl (2013) performed a survey on the use of Cannabis Sativa and its effects on patients with Tourette's Syndromes and other psychiatric comorbidities, including motor vocal tics, obsessive and compulsive behavior, and ADHD (Müller-Vahl). Over 80% reported that their symptoms were improved or resolved (Müller-Vahl). None of these patients had reported any adverse effects during the duration of their cannabis use (Müller-Vahl pg, 120).

Hemming & Yellowlees (1993) report a single subject case involving a 36-year-old man named Mr. A who discovered an effective treatment for his Tourettes Syndrome. Mr. A began smoking a regular dose of a "cone" per night (Hemming & Yellowlees). Within a week, the results showed that "he was completely symptom-free, much to his surprise and delight" (Hemming & Yellowlees, pg. 390). Similar to Hemming & Yellowlees (1993), Sandyk (1988) reported the results of marijuana therapy in male patients ages 15, 17, and 39 years old who all have Tourette's Syndrome. The first patient was a 15-year-old boy who smoked 1-2 marijuana joints daily (Sandyk). His mother reported a 50% decrease in his tic symptoms (Sandyk). The second patient is 17 years old and was diagnosed with Tourette's Syndrome at age seven (Sandyk). His symptoms

include frequent jerk movements of his neck muscles, infrequent vocalizations, and anxiety (Sandyk). After using recreational marijuana, his relaxation levels had increased while his tics decreased by 70% (Sandyk). Lastly, we have a 39-year-old patient diagnosed with Tourette's Syndrome at age nine (Sandyk). His symptoms included neck and leg jerking, blinking, chronic insomnia, and hypersexuality (Sandyk). He admitted that smoking 1-½ marijuana joints a day reduces his hypersexuality and motor tics (Sandyk).

In conclusion, medical cannabis can be a promising treatment for patients who suffer from TS. Like the ASD studies, these experiments still need better characterization of the roles of cannabis compounds on TS patients through more well-controlled studies (Abi-Jaoude et al., 2017).

Medical Marijuana effects on Epilepsy

Around three million people in the United States are diagnosed with epilepsy, and ⅓ of these patients report poorly controlled seizures (Kolikonda et al.,2016). Many of these patients suffer through their symptoms with a decrease in their quality of life. Therefore, marijuana therapy is introduced to children and adults with different epilepsy disorders. The anti-inflammatory component of marijuana known as CBD has impacted seizure symptoms for patients.

Maa and Figi (2014) reported a medical marijuana research study on a pediatric patient named Charlotte diagnosed with Dravet syndrome. Dravet syndrome is drug-resistant epilepsy that is lifelong, presenting prolonged seizures that affect one side of the body (Joshi & Wirell, 2020). After treating the cannabidiol/Δ9-tetrahydrocannabinol (CBD: THC) strain of cannabis, Charlotte experienced a decrease in seizures from 50 per day to 2-3 per month (Maa & Figi). Further pediatric studies such as Dimah (2014) also found that symptoms of seizures were diminishing in response to CBD treatment. Dimah conducted a study upon a 10-month-old patient receiving treatment involving the non-psychoactive part of marijuana known as CBD to minimize his seizures. Dimah found that the infant demonstrated developmental gains and seizure reduction in response to the CBD treatment.

Kolikonda et al. (2016) reported a survey that 24% of epilepsy patients admitted utilizing marijuana and claimed it was beneficial to them. In a pilot study, CBD versus placebo was conducted upon eight normal volunteers and 15 patients with epilepsy (Kolikonda et al.). These participants were randomly placed in double-blinded CBD treatment for phases that lasted between 30-135 days (Kolikonda et al.). Kolikonda et al. reported that subjects among CBD treatments claimed to be seizure-free, decreased frequency, or unchanged. Six reported no improvement among seven placebo-treated individuals, while one claimed better seizure control (Kolikonda et al.). Like Kolikonda et al., Fong & Kossoff (2018) used controlled experimental studies to determine the effects of CBD on epilepsy patients. The Fong & Kossoff study has a few randomized controlled trials (RCTs) that test the safety and efficacy of CBD on epilepsy patients (Fong & Kossoff). These had involved trial sites throughout the United States and Europe, which helped diversify the research patient population (Fong & Kossoff). Across three RCTs, patients diagnosed with Lennox-Gastaut syndrome, a severe form of epilepsy, were treated with CBD (Fong & Kossoff). The results showed that patients reported reduced seizure frequency or overall symptom-free of seizures (Fong & Kossoff).

Conclusion

This literature review focused on the results of medical marijuana therapy for patients with ASD, Epilepsy, and Tourettes. More evidence is needed to ensure that medical marijuana effectively treats patients with these disorders. Marijuana or any drug has not been discovered to permanently cure symptoms of patients with ASD, Epilepsy, or Tourette's. However, large-scale studies like the ones discussed in this review help build our knowledge of the safety and effects of cannabis on patients. Future research involving more control groups can help create a cause-and-effect relationship between medical marijuana and neurobehavioral symptoms. In the near future, as more research is conducted, marijuana can be brought out of the dark light and into a new light as an opportunity to change lives. When more research is found on marijuana having the potential to be safely

admitted as a new therapy, then more individuals can be introduced to this therapy.

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