Is CBD an Effective Treatment for Epilepsy?

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In recent years, the use of CBD to reduce uncontrollable epileptic seizures has become a topic of interest. Many studies have looked at the reduction of seizures when combining CBD with medications, or even on its own.

Cannabidiol (CBD), is a cannabis component extracted from Cannabis sativa that has increased in popularity and use in recent years. It is known to have calming, anti-anxiety effects without experiencing a physical high. It has shown to be useful for many people, not just those with seizures. It helps with anxiety, mood disorders, relaxation, and sleep, as well. This has become a very popular product in skincare, teas, honey, oils, and more. It's also known to have healing properties, as research shows it may reduce seizures in those who have epilepsy, a condition involving abnormal brain activity.

Epilepsy is a disease that plagues over 50 million people worldwide. For a third of patients, seizures are frequent and uncontrollable, even with medication. (Geffrey, Pollack, Bruno, and Thiele, 2015). CBD is recommended by clinicians, as Epidiolex, a form of CBD, is FDA approved to help with seizures. (Epilepsy Foudation, 2020). The first case of CBD and epileptic seizures happened in Colorado when a young girl's parents discovered that the use of cannabidiol dramatically decreased her seizures (U.S. News, 2020). Since then, many studies have looked at the effects of CBD on seizures.

One study, Geffrey, Pollack, Bruno, and Thiele (2015), directed focus on refractory epilepsy— or uncontrollable epilepsy—to study the effects of CBD on seizures. Researchers used a clinical trial, paying attention to 13 out of 20 participants that had met the criteria needed. There were no placebos, independent variables, or dependent variables, as each participant was given the same substances at the same dosage. They predicted a drug-drug interaction, as the participants were also taking Clobazam along with the CBD. They had a sample of 13

participants, ranging from 4 to 19 years old. Researchers had the participants begin with 5 mg of CBD a day with an eventual goal of 25 mg a day, over the course of 8 weeks. Researchers studied their symptoms closely. Various participants required dosage adjustments, either decreasing Clobazam or CBD.

The results showed that nine of thirteen participants had a decrease in seizures, around 51%, during the study. Interestingly, two of the other participants showed an increase in seizures. Ten out of thirteen participants needed to reduce the dosage of Clobazam, but research shows that this medication does not affect the metabolism rates of CBD. Overall, a drug-drug relationship proved to exist between CBD and Clobazam. Patients showed to tolerate CBD well, while also proving helpful to seizure reduction.

Another article, Tzadok, Uliel-Siboni, Linder, Kramer, Epstein, Menascu, Nissenkorn, Yosef, Hyman, Granot, Dor, Lerman-Sagie, Ben-Zeev (2015), looked specifically at pediatric epilepsy and CBD. The study used patients from five clinics in Israel, then further narrowed down participants based on criteria: use of CBD for at least three months, under 19 years old, and have uncontrollable seizures. It is a retrospective study, with 74 child/adolescent participants who have refractory epilepsy. There are no control groups, independent variables, or dependent variables.

Researchers divided the participants into groups based on etiology. It includes: acquired, early epileptic encephalopathy with a known genetic etiology, epileptic encephalopathy without a known genetic etiology, congenital brain malformations, hypoxic-ischemic encephalopathy, other--etiology not defined (Tzadok, Uliel-Siboni, Linder, Kramer, Epstein, Menascu, Nissenkorn, Yosef, Hyman, Granot, Dor, Lerman-Sagie, Ben-Zeev, 2015). They then recorded results based on groups and overall outcomes.

CBD doses ranged from 1 to 20 mg a day, depending on the patient's needs and tolerance. The median duration of CBD doses was five months, with a follow up at ten months. 89% of patients, reported by parents, said that there was a reduction in seizures. Surprisingly, 13% of patients saw a drastic reduction, almost 100%, while 34% of patients saw a 50% reduction in seizures. Based on etiology groups, the two "epileptic encephalopathies with or without known genetic mutations" groups showed significant seizure reduction. 66% of the patients showed a 25% reduction in seizure frequency, and 51% between 50 and 100% reduction in seizure frequency. (Tzadok, Uliel-Siboni, Linder, Kramer, Epstein, Menascu, Nissenkorn, Yosef, Hyman, Granot, Dor, Lerman-Sagie, Ben-Zeev, 2015). Researchers say that CBD for seizures is increasing in popularity, with highly promising results. Since it is a retrospective study, there is no control group, consistent rates of dosage, and a reliance on parental report.

Another study, Mao, You, Lei, Zhang, 2015, took a different, prospective route by testing on seizure-induced rats. Epilepsy affects 50 million people globally, with many unable to stop seizures even with medication (Mao, You, Lei, Zhang, 2015). Researchers decided to test with rats to get a better predictor for humans. They aimed to look at the anticonvulsive properties of CBD, predicting that when testing with rats, there would be a decrease in seizures, based on other research.

The rats were broken into groups—normal control (only given saline), model control (saline and pentylenetetrazole), 10 mg of CBD, 20 mg of CBD, and 50 mg of CBD. All groups except normal control were injected with pentylenetetrazole to induce seizures, then given their assigned amount CBD, which for the controls, was none. Researchers then measured the seizures on a scale of zero to five-stage 0 is no response, stage 1 is ear and facial twitching, stage 2 is convulsive body wave, stage 3 is myoclonic jerks, stage 4 is turning onto their side, and stage 5

is turning onto their back. (Mao, You, Lei, Zhang, 2015). The pentylenetetrazole was injected for 28 consecutive days, along with the saline and CBD. Each day the seizures were graded.

The results show that high doses of CBD decreased seizures more than the control groups' seizures. Interestingly, the low CBD doses were about equal with the control group. The brains of the rats were examined afterward, showing that CBD decreases hyperplasia, cell damage to the hippocampal area, as well as suppressing actions of hippocampal receptor NMDA1.

In the conclusion of these three articles, each one shows that CBD proves useful for seizure reduction. Low doses of CBD proved to be less helpful, but higher doses seem to decrease seizures drastically. It also seems to work well with other needed medications without being metabolized. On the other hand, some side effects do occur—one being drowsiness. Since CBD is used to help with sleep, it is no surprise that it can cause sleepiness and fatigue. As CBD increases in popularity and various products, it is becoming more affordable and easier to obtain. If it continues to become easier to obtain, more prospective studies will become available and affordable to study the effects of CBD on epileptic seizures.

There is more research to be done on CBD and epilepsy. Most studies have been small and short, so moving forward, I think that a large, prospective study with control groups, different dosages and types of CBD, and different types of epilepsy will prove useful to learn more. Also, periodic check-ins with clinicians instead of the parental report will help, as opposed to trusting self-report completely. Though in the meantime, CBD is safe and sold in various forms without needing a doctor's prescription. CBD also helps with sleep—which is crucial to decrease seizures as well.

References

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