An 81-Year-Old Male with Advanced Dementia and Recurrent Cerebrovascular Events: Is There a Place for Cannabidiol Therapy?

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Recurrent cerebrovascular events can cause dementia [1] and multi-infarct dementia [2]. Following significant deterioration of cognitive and functional statuses, patients are usually placed in professional nursing homes [1]. The only care that is provided is palliative, as no additional treatment or therapy currently exist [1,2].

The purpose of this article is to increase awareness among clinicians, especially physicians who treat elderly patients, regarding the potential contribution of cannabidiol (CBD) therapy for patients with advanced dementia and recurrent cerebrovascular events.

PATIENT DESCRIPTION

The patient described in this case study was an 81-year-old male from Israel, married with six children. To ensure patient privacy and anonymity, no identifiable details are disclosed. The patient's family approved the publication of this case. There was no need for approval from the ethics committee at our institution.

The patient was first diagnosed with dementia in 2012, 7 years after his first cerebrovascular event and immediately following his second. At the time of this case study, he lived at home with his wife and had 24-hour live-in care. Due to severe spasticity, the patient was wheelchair bound and required assistance for most tasks of daily living.

In addition to dementia, the patient presented with other medical conditions. In 2005, he was diagnosed with both diabetes mellitus and hypertension. Moreover, since his first two cerebrovascular events in 2005 and 2012, he endured many more such events, as seen in the patient's computed tomography (CT) scan of his brain from 2017 [Figure 1]. In 2014, the patient also experienced the first of recurrent intracerebral hemorrhage episodes following a road accident. A ventriculoperitoneal shunt was inserted in 2016. These episodes were almost always followed by convulsions. Last, the patient also presented with recurring urinary tract infections and pneumonia, for which he had been hospitalized numerous times. In 2016, during one of these hospitalizations, the patient underwent a tracheostomy procedure due to difficulties being weaned off the respirator. At the time of this case study, he was fed solely through a gastrointestinal feeding tube.

Figure 1. Computed tomography scan from 2017

The patient took the following six different types of medication for his various illnesses and symptoms: furosemide 40 mg × 1/day, visoprolol 2.5 mg × 1/day, metformin 850 mg × 1/day, esomeprazole 20 mg × 1/day, and syr Epanutin 300 mg × 1/day. He also took a combination of carbidopa 25 mg/levodopa 250 mg in the morning, carbidopa 12.5 mg/levodopa 125 mg in the afternoon, and carbidopa 12.5mg/levodopa 125mg in the evening. Baclofen was previously also taken to relieve spasticity, yet it was not effective.

For a few months, the patient was drowsy most of the time, barely able to open his eyes and maintain eye connection for more than a few seconds. Unable to speak, he was hardly able to communicate with others. Moreover, due to his severe spasticity, transferring him from bed to wheelchair to bed was increasingly difficult.

With the aim of alleviating his spasticity, the patient's geriatrician (VH) initiated a trial of CBD therapy. The patient was administered one drop of cannabidiol oil C20 three times per day for approximately 7 days, followed by an increase to four drops in the daily dose. Within a few days, the patient began to exhibit signs of alertness, even saying a number of words to his family members, such as greeting his granddaughter with words and with a smile.

One month after beginning this treatment, the patient continued to be more alert and responsive, saying a few words sporadically, and moving his lips in an attempt to say more. The patient was also able to maintain eye contact with those around him for more than just a few seconds and his spasticity significantly decreased.

COMMENT

More than 545 different compounds have been isolated from various strains of Cannabis Sativa, with more than 100 classified as phytocannabinoids. The two most prominent and researched phytocannabinoids are Δ9 tetrahydrocannabinol (THC) and cannabidiol (CBD), each with their own merits and distinctive features. THC is considered the major psychoactive ingredient in Cannabis Sativa, while CBD is considered a major nonpsychoactive ingredient. Both are a lipophilic molecule.

To date, there are two main cannabinoid receptor subtypes: CB1 and CB2. While both are classified as Gi/o protein-coupled receptors, CB1 is more prominently distributed in the central nervous system, whereas CB2 is more prominently distributed in the immune system. However, evidence suggests that cannabinoid compounds do not bind solely to CBD receptors but may also interact with additional receptors, such as transient receptor potential cation channel subfamily V member 1 channels (TRPV1) and peroxisome proliferator-activated receptors (PPARs). It is the endocannabinoid system that seems to play a major part in modulating the dopaminergic transmission in the basal ganglia. Preclinical data suggest that selective pharmacological intervention in the endocannabinoid-system signaling pathway may have a beneficial effect in Parkinson's disease, both on motor and non-motor symptoms. An additional benefit may include neuroprotection [3].

Moreover, while THC and CBD were found to have anticonvulsive properties in both in vitro and animal models, most studies suggest that CBD is more effective in reducing epileptic activity than THC. However, the anti-epileptic mechanism of CBD has not been fully elucidated and is considered to be mediated by G protein-coupled cannabinoid receptor type 1 (CB1R) and type 2 (CB2R), as well as by other non-cannabinoid receptors [4].

An additional effect may include a remarkable reduction in symptom frequency. CBD seems to reduce sleep disturbances and improve sleep quality without affecting sleep duration, and may help patients experiencing rapid eye movement sleep behavior disorders and Parkinson's disease [3].

To the best of our knowledge, there are no studies on the effect of CBD on cerebrovascular disorders or on apathy and drowsiness among patients with advanced dementia. In the case study presented in this paper, the patient required round-the-clock care and assistance because of his recurrent cerebrovascular events, advanced dementia, severe spasticity, and complete inability to care for himself. His increased alertness and communication capabilities following his CBD therapy, which was aimed at treating his spasticity, revealed a potentially new type of treatment, providing the patient and his family with a certain degree of both hope and relief.

Although case studies are low on the hierarchy of clinical evidence due to methodological limitations, they are useful in medical research and evidence-based medicine. For example, they can provide a unique understanding of clinical aspects of both rare and common diseases, and in turn help generate new study hypotheses.

CONCLUSIONS

Based on this case study, we suggest that CBD be carefully studied as an option for treating patients with advanced dementia and recurrent cerebrovascular events. With the elderly population growing worldwide and the increased prevalence of dementia [5], studies that examine the potential of CBD therapy for the elderly are of great importance.

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"Do not worry about your difficulties in mathematics. I can assure you that mine are still greater"

Albert Einstein (1879–1955), German-born theoretical physicist who developed the theory of relativity, one of the two pillars of modern physics (alongside quantum mechanics)

"A writer is, after all, only half his book. The other half is the reader and from the reader the writer learns"

Pamela Lyndon (P.L.) Travers (1899–1996), Australian–English author who spent most of her career in England. She is best known for the Mary Poppins series of children's books, which feature the magical nanny Mary Poppins