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Review

Cannabidiol Reduces Symptoms and Improves Quality of Life in Cystic Fibrosis: A Case Report

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ABSTRACT

In this case report, we demonstrate the use of cannabidiol (CBD) with low doses of tetrahydrocannabinol (THC) for symptom management in a pediatric patient with cystic fibrosis (CF) to improve the overall quality of life of the patient and their family. The parents of a two-year-old male patient diagnosed with cystic fibrosis due to the DF508 mutation in the CFTR gene sought a multidisciplinary team due to wheezing, hypersecretion, respiratory distress, and dyspepsia since birth. The patient used a CBD-rich full-spectrum oil (58.67% CBD: 4.09% THC), administered twice daily, with dose titration based on therapeutic effects and tolerance. Overall, the patient experienced a significant reduction in symptoms, after five weeks of CBD use. There was also an improvement in social interactions, concentration and emotional stability. A combination of high CBD and low dose THC oil has been shown to be an effective treatment option for managing CF symptoms, leading to an improved quality of life for both the patient and caregivers.

Keywords: Cannabidiol, Cystic Fibrosis, Pediatric, Quality of Life, Cannabis-Derived Treatment

1. Introduction

Cystic fibrosis (CF) is an autosomal recessive genetic disease characterized by dysfunction of the cystic fibrosis transmembrane conductance regulator (CFTR) gene, which encodes a chloride transmembrane conductance regulator protein that regulates and participates in the transport of electrolytes across cell membranes. There is chronic multisystem involvement that can be characterized by progressive lung disease, exocrine pancreatic dysfunction, liver disease, intestinal motility problems, male infertility (obstructive azoospermia), and high concentrations of electrolytes in sweat[1].

Patients with CF have viscous mucus in the airways, persistent bacterial infections, and excessive inflammation[2], which contribute to chronic symptoms such as coughing and respiratory discomfort. These symptoms significantly impact sleep quality and daily functioning. Given the inflammatory and symptomatic burden of CF, therapies targeting systemic inflammation without causing immunosuppression are increasingly researched.

Due to the peculiarities of the disease, multidisciplinary care is required, which allows for more comprehensive and effective treatments, leading to an increase in the life expectancy of patients. In an attempt to halt the progression of the pathophysiological process in CF, the search for an anti- inflammatory strategy without compromising immunosuppression has been the subject of research. Although an effective and safe drug for

this purpose has not yet been identified, there are promises regarding cystic fibrosis transmembrane conductance regulator-based approaches[3]. Products derived from *Cannabis sativa* L., known for their strong anti-inflammatory potential, may serve as an effective form of therapy for this condition, especially in the search for a better quality of life for CF patients. Here, we present a single case report of cannabinoid treatment for cystic fibrosis (CF).

Cannabis-derived products, especially those containing cannabidiol (CBD), are being investigated as potential therapies for cystic fibrosis due to their anti-inflammatory effects. Evidence suggests that these products could provide significant anti-inflammatory benefits without the immunosuppressive side effects that are often associated with conventional treatments. As a result, they present a promising alternative or complementary option for managing symptoms like wheezing, cough, and digestive issues, which are frequent in individuals with cystic fibrosis. Additionally, by alleviating these symptoms and potentially improving emotional well-being, cannabis-derived products might enhance the quality of life for patients and their families. Studies, including those looking into medical Cannabis use in cystic fibrosis patients and the impact of cannabidiol on airway inflammation, highlight the therapeutic potential of these substances. These insights emphasize the necessity for further research to confirm their effectiveness and safety in clinical practice.

2. Case Presentation

2.1. Pediatric patient

A 2-year-old boy from São Paulo, the third child of four pregnancies, born by cesarean section at 37 weeks, (APGAR score) = 8/9, borderline cystic fibrosis test, requiring oxygen support in the intensive care unit (ICU) for 12 hours. He was discharged after 24 hours in the maternity ward. The parents reported that the patient had projectile vomiting from the second day of life, was breastfed, and had diarrhea 6-7 times a day. Formula feeding was introduced at 3-4 months of age. The patient had no respiratory problems until 5 months of age, when hissing began. The parents noticed a delay in motor development. His weight was borderline until 10 months of age, at which time he entered the malnutrition curve with wheezing and required daily salbutamol sulfate.

2.2. The diagnosis

The parents sought advice and diagnosis from various doctors, and a screening test for the DF508 mutation in the CFTR gene was performed, which revealed the presence of a homozygous mutation. The result of this test, together with the result of less than 0.2 ug/g for pancreatic elastase, led the doctors following him to confirm the diagnosis of cystic fibrosis (ICD 10 - E84).

2.3. The treatment

After the confirmation of CF, dietary supplements and physiotherapy sessions were started twice a day, every day. At that time, the patient was followed by a health care team every 3 months. The parents reported that although the patient had been more stable for the past 3 months, he still had audible wheezing. They sought additional help because the patient also had abdominal distension, severe postprandial cough in the morning and at night, and snoring, which significantly affected his sleep and quality of life in general. The main complaints reported by the parents were: wheezing, hypersecretion, difficulty in breathing, digestive problems since birth.

The care was provided by a multidisciplinary health care team of App ViV - Assistente de Bem Viver, with the patient's parents via telemedicine. Measures such as general well-being and effects observed on the main complaints were evaluated weekly for five weeks - coughing, wheezing, breathing, abdominal distension; sleep; mood (anxiety and agitation); appetite; disposition - vitality; appetite; body weight; bowel activity (consistency and frequency of bowel movements); recent infections; medications (addition or withdrawal) and possible side effects.

2.4. The evolution of treatment

The patient began CBD treatment with a full-spectrum product derived from *Cannabis sativa* L. extract oil, rich in cannabidiol (CBD) at a CBD:THC concentration of 58.67%:4.09%. The dose was titrated according to weekly responses reported by the patient's parents. The patient underwent periodic monitoring tests, such as assessment of liver function through measurements of TGO and TGP enzymes and abdominal ultrasound to monitor possible adverse effects and patient safety.

(Table 1) presents the evolutionary picture before and up to 5 weeks after the introduction of full- spectrum CBD with descriptions of the measures reported by the parents in each teleconsultation. The patient improved shortly after the first week of cannabidiol use, according to the parents' reports. After 5 weeks of CBD use, the cough, which was frequent in the morning and after meals, disappeared. The mother reports that her sleep at night is infinitely better with the absence of coughing. Breathing is no longer audible. The physiotherapist noticed an improvement in breathing and a less distended abdomen. Parents report decreased irritability and increased appetite. With 20mg CBD/day (˜1,28mg THC), there was a peak improvement in oxygen saturation, which was around 96-97% and rose to 97-98%.

Table 1: A comparison of characteristics before and after initiating CBD treatment for the patient in the case presented.

Measure	Before CBD	1 week CBD	2 weeks CBD	3 weeks CBD	4 weeks CBD	5 weeks CBD
Dose of CBD		7,5 mg/twice a day	17,5 mg/twice a day	25 mg/twice a day	25 mg/twice a day	25 mg/twice a day
General condition	Panting and audible breathing. Abdominal distension. Low quality of life in general. Main symptoms: Wheezing, hypersecretio n, difficulty breathing, difficulty digesting (since birth).	Good	Notable improvement. Calmer breathing. Sleep is much better. Deflated belly. Much calmer with a better mood.	Notable improvement. Calmer breathing. Sleep at night is much better. Deflated belly. Much calmer with a better mood.	Notable improvement. Calmer breathing. Sleep quality improvement. Deflated belly. Much calmer with a better mood. Quite stable, reactive cough improves and appears less tired.	The cough, which was frequent in the morning and after eating, disappeared. Substantial improvement in night sleep with the absence of coughing. Breathing is no longer audible.

Sleepiness	Sleep is compromised by breathing difficulties, such as coughing and snoring.	No daytime drowsiness. Normal nap after lunch.	No daytime drowsiness. Normal nap after lunch.	No daytime drowsiness. Normal nap after lunch.	No daytime drowsiness. Normal nap after lunch.	No daytime drowsiness. Normal nap after lunch.
Anxiety/agitation	Discomfort and marked irritability due to breathing difficulties	No changes in irritability	No changes in irritability	Decreased irritability.	Decreased irritability.	Decreased irritability.
Appetite	Difficulty gaining weight	Increased appetite	Little increase in appetite. Eat very well.	Little increase in appetite. Eat very well.	Little increase in appetite. Eat very well.	Little increase in appetite. Eat very well.
Intestinal activity	Not determined	Less distended abdomen. Regular stools (5 to 6 times a day). Darker greenish.	Less distended abdomen. Regular stools (5 to 6 times a day). Darker greenish and consistent.	Less distended abdomen. Regular stools (5 to 6 times a day). Large volume of darker and more consistent greenish feces.	Less distended abdomen. Regular stools (5 to 6 times a day). Large volume of darker and more consistent greenish feces	Improvement in breathing and a less distended abdomen. Regular stools (5 to 6 times a day). Large volume of darker and more consistent greenish feces
Infections	Pseudomonas colonization	Pseudomonas colonization	Pseudomonas colonization. Negative antibiogram.	Pseudomonas colonization. Negative antibiogram.	Pseudomonas colonization. Negative antibiogram.	Pseudomonas colonization. Negative antibiogram.

The maximum daily dose titration was 15 drops twice a day (75 mg CBD:˜5mg THC/day) and the ideal dose was adjusted to 50 mg CBD: ˜3,32mg THCday, due to slight increase in transaminases (TGO 49U/L e TGP 67U/L), which normalized after this dose reduction. Five months after starting CBD rich oil, the parents report that the patient is “a very active child”. He plays and runs with his brothers every day. He has excellent respiratory quality, no wheezing and good quality sleep”.

After almost 6 months of follow-up, the CBD product was discontinued to avoid endangering the patient’s liver. Even after discontinuation, the patient’s improvement was maintained without liver changes, demonstrating an efficacy and safety profile.

3. Discussion

The endocannabinoid system plays a fundamental role in the regulation of inflammatory and immunological responses, so it makes sense to consider this system as a target for CF therapy. For example, lenabasum, a selective cannabinoid receptor type 2 (CB2) and non-immunosuppressive compound, has been shown in recent studies, including clinical trials, to inhibit the genetic transcription pathway in forms associated with inflammation and fibrosis, with a reduction in the production of pro-inflammatory and fibrotic mediators, safely[4,5].

In cystic fibrosis, clinical parameters such as respiratory symptoms, fever and weight gain as well as improvement in lung function need to be monitored in a multimodal approach[6,7]. These were the main points observed during the follow-up of the patients, with important improvements reported shortly after the start of treatment.

Regarding nutritional assessment in this condition, mainly considering children, an optimal nutritional status is necessary to support the growth stages and their puberty development, ensuring an optimal nutritional status in adult life. It is therefore necessary to include a: i) high-calorie, high-fat, high-protein diet, ii) control of malabsorption due to pancreatic enzyme replacement therapy, and iii) care to the appropriate supplementation of fat-soluble vitamins[8]. Therefore, during follow-up, questions were asked about the patient’s diet, appetite, and weight, and parents reported significant improvement.

Also, the prevalence of anxiety and depression in these patients is extremely high, with high rates also found in the parents. In this regard, two recent studies point to an increased use of phytocannabinoids to alleviate the symptoms of cystic fibrosis. One of them was developed by Tillman[9], who evaluated the prevalence of CBD use in adults with cystic fibrosis and observed that of the 96 patients affected by this disease, 11.5% (n = 11) were current users, 20.8% (n = 20) had already used it, 21.9% (n = 21) had never used it but were interested in using it, and 44.8% (n = 43) had never used it and did not plan to use it. The routes of administration were diverse: oral, inhalation, and/or topical, and of those who reported a reason for use/interest in using CBD, the most common were to treat sleep, anxiety, and pain. However, the authors reinforce that as the use of CBD becomes more widespread, it is important that doctors are aware of its use by patients, as studies have observed the pharmacological interaction between this phytocannabinoid and the cytochrome P450 (CYP450) enzyme system, especially CYP3A, involved in cystic fibrosis. Thus, patients’ reluctance to disclose CBD use may prevent doctors from identifying potential drug interactions and risks of treatment failure. This concern is justified, as another cross-sectional study used a unique electronic survey to assess the use of Cannabis[10], CBD, electronic cigarettes and cigarettes in people with CF aged >13 years. Among the 226 participants, 29% used Cannabis, 22% used CBD, 27% used e-cigarettes, and 22% used cigarettes in the past 12 months. The study demonstrated an increasing trend for all substance use in patients suffering from cystic fibrosis.

4. Limitations

It is important to acknowledge several limitations in this case report. Firstly, the study focuses on a single pediatric patient, which limits the generalizability of the findings to the broader population of cystic fibrosis patients. Additionally, the duration of the study is relatively short, covering only five weeks, and may not capture long-term effects or potential side effects of cannabidiol (CBD) use. Furthermore, the outcomes and improvements are largely based on parental reports, introducing possible bias or inaccuracies due to subjectivity. Lastly, the absence of a control group makes it challenging to attribute the observed improvements solely to the CBD treatment, as other factors could have contributed to the changes in the patient’s condition.

5. Conclusion

The treatment with a combination of high CBD and low dose THC oil has been shown to be an effective treatment option for managing CF symptoms, leading to an improved quality of life for both the patient and caregivers.

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7. References

1. Sharma PB, Sathe M, Savant AP. Year in Review 2020: Multisystemic impact of cystic fibrosis. Pediatr Pulmonol, 2021;56: 3110-3119.
2. Roesch EA, Nichols DP, Chmiel JF. Inflammation in cystic fibrosis: An update. Pediatr Pulmonol, 2018;53: 30-50.
3. Bruorton M, Goddard T. Drug treatment of cystic fibrosis. Aust Prescr, 2022;45: 171-175.
4. Spiera R, Hummers L, Chung L, et al. Safety and Efficacy of Lenabasum in a Phase II, Randomized, Placebo-Controlled Trial in Adults With Systemic Sclerosis. Arthritis Rheumatol, 2020;72: 1350-1360.
5. Chmiel JF, Flume P, Downey DG, et al. Safety and efficacy of lenabasum in a phase 2 randomized, placebo-controlled trial in adults with cystic fibrosis. J Cyst Fibros, 2021;20: 78-85.
6. Mondéjar-López P, Horsley A, Ratjen F, et al. A multimodal approach to detect and monitor early lung disease in cystic fibrosis. Expert Rev Respir Med, 2021;15: 761-772.
7. Gabel ME, Fox CK, Grimes RA, et al. Overweight and cystic fibrosis: An unexpected challenge. Pediatr Pulmonol, 2022;57: 40-49.
8. Mariotti Zani E, Grandinetti R, Cunico D, et al. Nutritional Care in Children with Cystic Fibrosis. Nutrients, 2023;15: 479.
9. Tillman EM, Gallaway KA, Colwell A, et al. Prevalence of cannabidiol use in persons with cystic fibrosis. Pediatr Pulmonol, 2024;59: 3790-3792.
10. Vaziri S, McGarry ME, Huang CY, et al. Time to be blunt: Substance use in cystic fibrosis. Pediatr Pulmonol, 2024;59: 1015-1027.