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Research Article

Pilot Clinical Trial Validates the Safety and Efficacy of a Full Spectrum Phytocannabinoid Micellar Formulation

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Abstract

The cannabis plant is composed of a naturally occurring mixture of phytocannabinoids, terpenoids, flavonoids, steroids and enzymes. Even at low doses of CBD, the most widely known and studied cannabinoid, effects that promote and maintain health, include antioxidative, anti-inflammatory, anti-microbial and neuroprotection effects have been described. This study evaluates a panel of biomarkers which are associated with two significant areas of interest explored by others for application of phytocannabinoid formulations. These are biomarkers associated with systemic inflammatory processes and a second panel of biomarkers related to cholesterol, lipid and sugar metabolism as risk factors for diabetes, a disease process with a large inflammatory component. In this study, utilizing this overlapping biomarker panel we evaluated the systemic safety of CBD delivered as a component of a CBD broad spectrum micellar phytocannabinoid formulation Hempzorb81®. We report here these effects include: decreased anxiety and joint pain; statistically significant reductions in the inflammatory markers including TNFα and IL-6 (p-value 0.03) and reduced ESR and CRP levels; HbA1c markedly decreased on average 1.0 mmol during the study time and homocysteine reduced by 20% (p-value 0.02). These finding indicate a potential role for Full Spectrum Hemp Oil micellized by Purzorb® technology as a potential adjuvant or natural plant product alternative treatment for both inflammatory and diabetes related diseases. There were no reported untoward effects of any type reported by subjects for the length of the study. Therefore, we conclude that Full Spectrum Hemp Oil (Med7) was shown by our empirics and clinical oversight to be a safe and effective formulation within this Pilot study.

Introduction

Cannabidiol (CBD) is one of the naturally occurring cannabinoids found in cannabis. It is a 21-carbon terpenophenolic compound which is formed following decarboxylation from the cannabidiolic acid precursor. In contrast to Δ9-THC, CBD is non-intoxicating, but exerts a number of beneficial pharmacological effects [1]. At lower doses, effects that promote and maintain health, including antioxidative, anti-inflammatory, and potentially neuroprotection effects [2-4] have been evaluated. The cannabis plant is also composed of a chemical mixture [5] that includes phytocannabinoids, terpenoids, flavonoids, their metabolites as well as steroids and enzymes [6]. While the exact mechanism of action is not fully understood, the combined effect is most accurately described by traditional pharmacological terms pertaining to other plant-based medicinal products and polypharmacy in general (e.g., synergistic interactions and bioenhancement) [7].

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Materials and Methods

Purzorb® is a proprietary micellization process which micellizes a decarboxylated full spectrum hemp oil (including CBD and trace amounts of THC) mixture suitable for oral ingestion. Hempzorb81® is an 81% cannabinoid full spectrum hemp oil micellized using the Purzorb® technology [8]. The oil is extracted from industrial hemp Cannabis sativa plants using supercritical CO_2 with column chromatography to remove THCΔ9 resulting in a non-intoxicating oil with only trace amounts recorded as non-detectable (ND). According to the manufacturer each particle size is approximately 22 nm making it highly permeable in water. Animal models with Hempzorb81® have demonstrated a rapid and almost complete absorption (85%) across the intestinal lining using Franz diffusion apparatus.

Human pharmacokinetic studies have also demonstrated that the onset of Hempzorb81™ is rapid and it has a lasting duration of CBD availability in the blood stream [9]. Patients in these pharmacokinetic studies were measured to have over 50% of the available CBD in their blood stream by the first blood sample timepoint of 15 minutes. This exceeds what has been shown with CBD or THC that has been inhaled or vaped. The blood levels then measured were significantly higher than what has been seen with standard CBD oil and other CBD solubilizing methods. The comprehensive review of 132 original studies [10] suggests chronic use and high doses of CBD up to 1500 mg per day have been repeatedly shown to be well tolerated by humans.

Study purpose

This was a one hundred and fifty subject, sixty-day, clinical study

for the purpose of establishing safety and effectiveness of Hempzorb81® Full Spectrum Hemp Oil (Med7). Documenting the effect of the full spectrum hemp oil (FSHO) on markers of inflammation, cholesterol and sugar metabolism, and indirect neuropsychiatric affect measures like sleep and mood were selected for empiric evaluation. The normal and abnormal ranges of each biomarker have been analytically defined by medical laboratory practice and service; therefore, as accepted metabolic values for monitoring. Subjects were instructed to take 2 ml dose once daily for the duration of the study. No other change to diet, fluid intake, or exercise was recommended. The amount of Hempzorb81® in each 2 ml dose contained 150 mg total phytocannabinoids. The CBD content per Hempzorb81™ dose was 10 mg.

Study type

This was a double-blind, placebo-controlled, multisite, and randomized effectiveness study performed on human subjects with statistically significant findings (p-values=0.02 and -0.03). Study Mean Age= 55 ± 5 yrs. Male: Female= 58:92.

Study Overview

Screening and testing procedures

Initial screening of subjects completed before the baseline data was taken for this test included: AST, ALT, to assess liver function, creatinine and BUN, TSH for the evaluation of the thyroid and to help evaluate kidney function, a standard RBC, CBC, and platelets were drawn and evaluated for baseline health status.

Subjects were consented and randomly assigned to either the test or the control group. Subjects were given instruction on how to consume this study product Hempzorb81™ Full Spectrum Hemp Oil. This procedure consisted of placing the oil under the tongue for up to 1 minute to improve absorption, then to swallow. Subjects were instructed to not eat or drink for up to 30 minutes after dosing. All subjects were instructed not to change their eating, drinking, or exercise habits for the duration of this study. All subjects were provided with a 24-hour emergency number. Subjects were informed if they had any concerns, they should contact their healthcare professional at once or go directly to their local emergency room for evaluation.

Inclusion criteria

- Subjects who signed a written informed consent consistent with required guidelines and met prior to participation in the trial.
- Subjects 18 years of age or older, either sex.
- Subjects who are not on any medication or dietary supplement.
- Subjects who have normal kidney, liver, and thyroid functions, and normal CBC prior to the start date of this study.
- Subjects who are able to follow the protocol as designed.
- Subjects in generally good health.

Exclusion criteria

- History of head trauma.
- History of serious diseases or illness diagnosed at this time.
- Known moderate to severe renal insufficiency.
- Recent history (<6 months prior to Visit 1) of myocardial infarction.
- Subjects who regularly use oxygen therapy.
- Subjects with known active tuberculosis.
- Subjects with a history of cancer within the last 5 years.
- Subjects who have undergone thoracotomy with pulmonary resection within 1 year prior to the trial.
- Subjects who are currently in a pulmonary rehabilitation program or who have completed a pulmonary rehabilitation program in the 6 weeks prior to the screening visit (Visit 1).
- Subjects currently prescribed diuretic medications, cardiac stimulants, or any other prescribed or non-prescribed medication that may, in the opinion of the Clinical Studies USA staff, alter testing results.
- Use of opiate analgesics prescribed or otherwise obtained for any treatment reason including migraine treatment or for recreational purposes.
- History of drug or alcohol addiction.
- Females who are pregnant, lactating, or nursing or who may become pregnant during the course of the study.
- Patients diagnosed as HIV-positive, diagnosed with AIDS, or with any neuromuscular condition including CP, MS, ALS, or Huntington's Chorea.
- Patients with uncontrolled hypertension (e.g. BP>150/100).
- Subjects who have used steroid therapy within the last 6 months.
- Patients with any condition not previously named that, in the opinion of the investigators or intake staff, would jeopardize the safety of the patient or affect the validity of the data collected in this study

Results

Anxiety

This study evaluated anxiety using an online testing system of evaluation questions. Patients used computers to report their baseline and results. The Mood Rating Scale [11] was used to assess anxiety and current mood. CBD has shown a trend toward some reduction of anxiety as well as encouraged sleep. This 10-level scoring system is a sliding scale of 1-10 with 1 being Happy and 10 being mostly feeling anxiety (Table 1 and Figure 1).

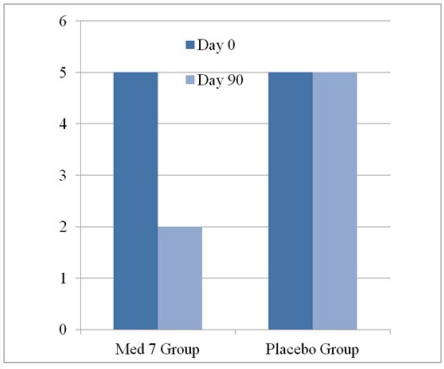


Figure 1: Anxiety reduction using the Mood Rating Scale on Day 0 and Day 60.

Table 1: Anxiety rating.

Med7 Study Product Group	Placebo Product Group
Day 0 average- 5 some anxiety	Day 0 average- 5 some anxiety
Day 60 average- 2 mostly happy	Day 60 average- 5 some anxiety
91% of the subjects in the Med7 Study Product Group reported longer sleep with more periods of dreaming	No changes in sleep were reported

Joint pain

Joint pain can be discomfort, pain or inflammation arising from any part of a joint - including cartilage, bone, ligaments, tendons, or muscles. Most commonly, however, joint pain refers to arthritis or arthralgia, which is inflammation or pain from within the joint itself. Specific disorders for the joint pain were not identified in this study. Joints that were reported as being sore or in pain by fifty-six of the subjects in this study were evaluated for pain by measuring of the joint, evaluation of localized heat, evaluation of swelling, and range of motion. Initial evaluation was completed on Day 0 and final evaluation was completed on Day 60.

Pain levels

1. No pain
2. Mild pain - completely normal movement, no limits
3. Moderate pain -20% decrease in normal movement, some limits of daily use
4. Intermittent severe pain - up to 50% decrease in normal movement, some limits of daily use
5. Severe pain - up to 80% decrease in normal movement, more limits of daily use
6. Constant severe pain - up to 100% pain in normal movement or no movement

Pain and inflammation markers

C-Reactive protein: C-reactive protein (CRP) is produced by the liver. Its level rises when there is systemic inflammation. LDL cholesterol not only coats the walls of your arteries, but it also damages them. This damage causes inflammation that the body tries to heal by sending in response proteins like CRP. Studies have found that testing for CRP levels may be a better gage of cardiovascular disease than the LDL test levels. The CRP test does not specifically identify heart disease; it is a test for general inflammation in the body. The testing method in this study was with the Immunochemiluminometric Assay (Tables 2 and 3). The mean improvement seen following Med7 administration is shown in Figure 2.

CRP level: lower than 1.0 mg/L -- low risk of heart disease; 1.0 mg/L to 3.0 mg/L -- moderate risk of CVD; more than 3.0 mg/L -- high risk of CVD).

Tumor necrosis factor

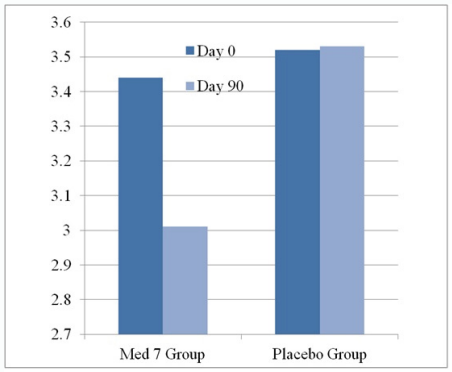
Tumor necrosis factor (TNFα) is a multifunctional cytokine that plays important roles in diverse cellular events such as cell survival, proliferation, differentiation, and death. As a pro-inflammatory cytokine, TNF is secreted by inflammatory cells, which may be involved in inflammation-associated carcinogenesis.

Table 2: Subject pain levels on Day 0 and Day 60 Day.

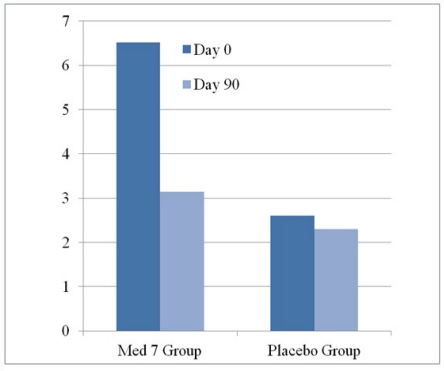
Day 0	Day 60
36 Subjects in the Med7 Study Product Group on Day 0 were #3	31 subjects in the Med7 Study Product Group were at level #2
7 Subjects in the Med7 Study Product Group on Day 0 were #2	12 subjects in the Med7 Study Product Group were at level #1
8 Subjects in the placebo group on Day 0 were #3	8 subjects in the placebo group were at #3

Table 3: Indicators of systemic inflammation and heart risk factors; average group values on Day 0 and Day 60.

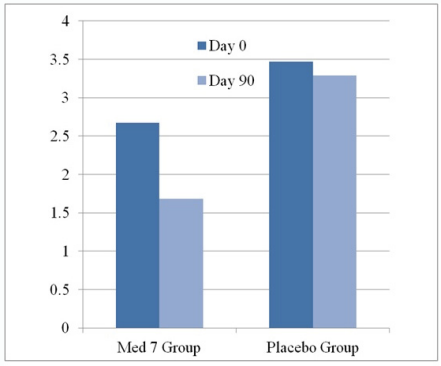
Med7 Study Product Group	Placebo Product Group
C-reactive protein	
(CRP level: lower than 1.0 mg/L -- low risk of heart disease; 1.0 mg/L to 3.0 mg/L -- moderate risk of CVD; more than 3.0 mg/L -- high risk of CVD)	
Day 0 average- 3.436 mg/L	Day 0 average- 3.52 mg/L
Day 60 average- 3.012 mg/L	Day 60 average- 3.53 mg/L
Tumor necrosis factor (normal 0-5 ng/mL)	
Day 0 average- 6.52 ng/mL	Day 0 average- 2.6 ng/mL
Day 60 average- 3.14 ng/mL	Day 60 average- 2.3 ng/mL
Interleukin 6 (normal value ≤1.8 pg/mL)	
Day 0 average- 2.67 pg/mL	Day 0 average- 3.47 pg/mL
Day 60 average- 1.68 pg/mL	Day 60 average- 3.29 pg/mL
Erythrocyte sedimentation rate (normal testing values 0-20 mm/hr)	
Day 0 average- 24.2 mm/hr	Day 0 average- 24.16 mm/hr
Day 60 average- 19.52 mm/hr	Day 60 average- 23.88 mm/hr
High density lipoprotein (preferred values > 30 mg/dl but <60 mg/dL)	
Day 0 average- 56.62 mg/dL	Day 0 average- 50.1 mg/dL
Day 60 average- 61.27 mg/dL	Day 60 average- 49 mg/dL
Low density lipoprotein (normal test results 150-199 mg/dL)	
Day 0 average- 201.6 mg/dL	Day 0 average- 191.9 mg/dL
Day 60 average- 198.1 mg/dL	Day 60 average- 191.0 mg/dL
Homocysteine (normal values 4-15 µmol/L)	
Day 0 average- 24.2 µmol/L)	Day 0 average- 19.42 µmol/L)
Day 60 average- 19.52 µmol/L)	Day 60 average- 19.86 µmol/L)
A1c (4-5.6 mmol/L)	
Day 0 average- 6.0 mmol/L	
Day 90 average- 5.08 mmol/L	



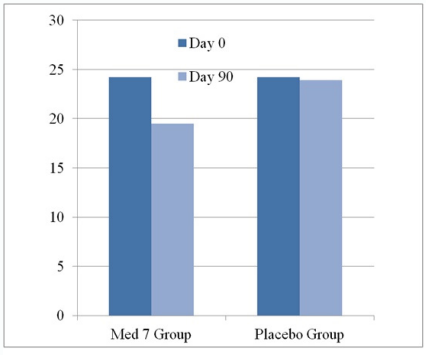
CRP level: lower than 1.0 mg/L -- low risk of heart disease; 1.0 mg/L to 3.0 mg/L -- moderate risk of CVD; more than 3.0 mg/L -- high risk of CVD)
Figure 2: C-Reactive Protein average value (mg/L) on Day 0 and Day 60.



TNF normal range 0-5 ng/mL
Figure 3: Tumor necrosis factor values (ng/mL) on Day 0 and Day 60 (Med 7 change, p value=0.03).



IL 6 normal range ≤1.8 pg/mL
Figure 4: Interleukin 6 average values (pg/mL) on Day 0 and Day 60 (Med7 change, p value=0.03).



Erythrocyte sedimentation rate normal range 0-20 mm/hr
Figure 5: Average group value of Erythrocyte sedimentation rate (mm/hr) on Day 0 and Day 60.

TNF exerts its biological functions through activating distinct signaling pathways such as nuclear factor κB (NF-κB) and c-Jun N-terminal kinase (JNK). NF-κB is a major cell survival signal that is anti-apoptotic while sustained JNK activation contributes to cell death. The crosstalk between the NF-κB and JNK is involved in determining cellular outcomes in response to TNF. The improvement in this marker within the Med7 Group is seen in Table 3 and Figure 3 with values dropping from high at baseline into the normal range on Day 60. Based on Table 2, it seems that the blind randomization may have led to many more subjects who reported pain were randomized into the Med7 Study Product Group, hence higher Day 0 TNF values on Day 0.

Interleukin 6

Interleukin 6 (IL-6) is a multifunctional cytokine produced by various cells. IL-6 acts on B cells, hematopoietic stem cells and hepatocytes and induces hematopoiesis as well as acute phase reactions. It also acts on T-cells, nerve cells, keratinocytes, renal mesangial cells, megakaryocytes and myeloma/plasmacytoma cells, antibody production, hematopoiesis, and is involved in acute phase reactions, infection, inflammation and tissue injury. IL-6 has a central role in host defense mechanisms and the inflammatory response. Deregulation of IL-6 gene expression is involved in the pathogenesis of polyclonal and monoclonal B cell abnormalities, such as rheumatoid arthritis and multiple myeloma. The values listed in Table 3 were obtained using an enzyme-linked immunosorbent assay. A significant drop in average blood interleukin 6 values were found following 60 days of Med7 administration with the average value for the group falling into the normal range of 1.8 pg/mL (Table 3 and Figure 4). There is no obvious reason why the Placebo Group entered the study with higher average interleukin levels, but during the course of the study these slightly elevated levels in the Placebo Group did not drop significantly over the course of the study (Table 3 and Figure 4).

IL 6 normal range ≤1.8 pg/mL

Erythrocyte sedimentation rate

Erythrocyte sedimentation rate (ESR) is a non-specific indicator found useful to measure systemic inflammation. However, it does not identify the cause of inflammation. Therefore, the ESR test is typically combined as a member of a larger panel other tests to determine the cause of inflammatory symptoms (Figure 5).

ESR test results that are higher than normally indicate a systemic inflammatory process is present. This measure of generalized inflammation may be associated with autoimmune diseases, and infections both of which may result in diseases of bone, joints, and diseases of the heart.

The results for the 2 Study Groups are found in Table 3. The improvement in the average value for the Med7 Group is shown in Figure 5 with the average value of the group being within the range of normal on Day 60.

Markers for cardiovascular health

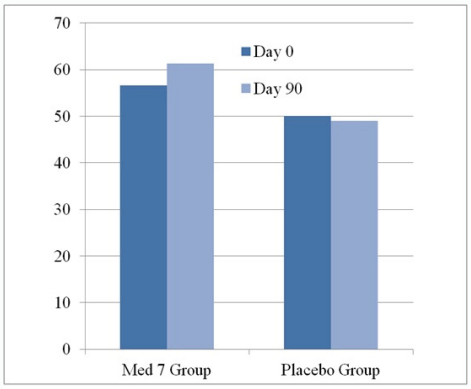
High density lipoprotein: HDL cholesterol acts in a variety of beneficial ways that reduce the risk for heart disease:

- HDL cholesterol scavenges and removes LDL, bad cholesterol.
- HDL reduces, and recycles LDL cholesterol by transporting it to the liver where it is reprocessed.
- HDL cholesterol repairs the inner walls (endothelium) of blood vessels. Damage to the inner walls is the first step in the process of atherosclerosis, which causes heart attacks and strokes. HDL scrubs the wall clean and promotes healthy vessels.

HDL cholesterol levels greater than 60 milligrams per deciliter (mg/dL) are considered high (positive for health).

HDL cholesterol levels less than 40 mg/dL are low (detrimental to health).

- The average for both study groups remained within the preferred normal range throughout the study (Table 3); however, the Med7 group did show a statistically significant (p value=0.02) increase in HDL blood concentration which may lead to increased heart and vascular health (Figure 6).



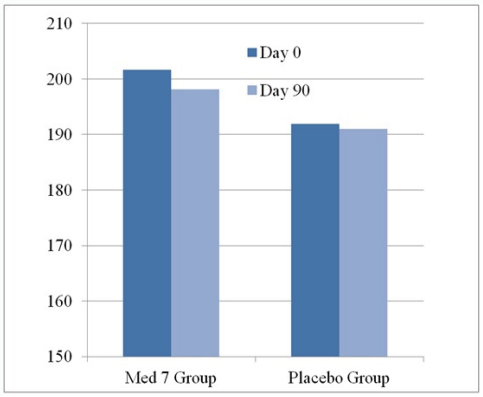
High density lipoprotein preferred values > 30 mg/dl but <60 mg/dL
Figure 6: High Density Lipoprotein (HDL) average value (mg/dL) on Day 0 and Day 60 (for the Med7 change p value=0.02).

Low density lipoprotein: Low density lipoprotein (LDL) is a microscopic layer made up of an outer rim of lipoprotein and a cholesterol center. Increased LDL levels >160 mg/dL, are considered "high" with the chance that with continued raised LDL levels fatty deposits called atherosclerotic plaque will form in the in the coronary arteries around the heart. The likelihood of associated cardiac diseases like heart attack and stroke is increased once plaque buildup is sufficient to slow the flow of blood to the heart.

Both groups in this study entered (Day 0) with meter read LDL levels above the recommended levels. For unknown reasons, the Med7 Group had higher average levels than the Placebo Group. After 60 days of treatment, the Med7 Group showed a drop in the average LDL levels which brought the group average value into the normal range (Figure 7). The statistical p value for this drop was 0.02.

Homocysteine

Having elevated levels of homocysteine in the blood (over



LDL normal test results 150-199 mg/dL
Figure 7: Low density lipoprotein group average levels (mg/dL) on Day 0 and Day 60 (for the Med7 change p value=0.02).

100 µmol/l) is referred to as hyper-homocysteinemia. Elevated homocysteine levels have been associated with heart attack, stroke, clot formation, and possibly the development of Alzheimer's disease. Elevated homocysteine levels in the body are asymptomatic.

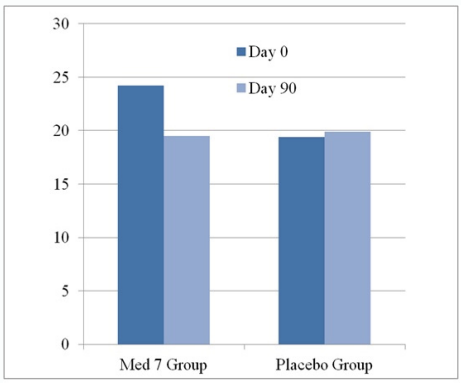
Elevated homocysteine levels affect the interior lining of blood vessels in the body, increasing the risk of atherosclerosis or narrowing of blood vessels. This can result in early heart attack and stroke. Similarly, the risk of deep vein thrombosis (DVT) and pulmonary embolism may be linked to elevated homocysteine levels [12] There also may be a relationship between elevated homocysteine levels and broken bones, especially in the elderly [13]. Alzheimer's disease and other types of dementia may be more frequently seen in patients with increased or elevated levels of homocysteine in the blood [14]. The subjects enrolled in this study had group average homocysteine levels that were above normal for both groups (Table 3) as measured by automated fluorescence polarization immunoassay. In the Med7 group, there was a statistically significant (p value=0.02) drop in the homocysteine levels (Table 3 and Figure 8). It is in a small study, as here, we cannot eliminate definitively the possibility that elevated homocysteine levels on Day 0 in the Med7 Study Product Group may have been associated with this group's higher incidence of reported pain (Table 2).

Diabetic marker

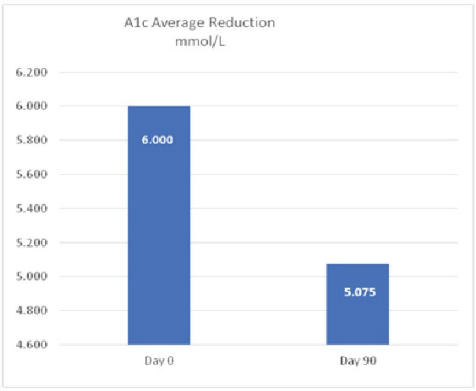
HbA1c: The A1c test is a common and standard blood test used to diagnose and monitor type 1 and type 2 diabetes. The A1c test is referred to by many other names, including glycated hemoglobin, glycosylated hemoglobin, hemoglobin A1c and HbA1c.

The A1c test result reflects the average blood sugar level for the 2-3 months prior to the test. Specifically, the A1c test measures what percentage of hemoglobin is coated with sugar (glycosylated). As blood sugar control decreases, the A1c levels increase, leading to a higher risk of diabetic complications.

Normal A1c level is below 5.7 percent. Levels between 5.7 and 6.4 percent are considered prediabetes indicating a higher risk of developing diabetes in the future. Above 6.5 is generally regarded as diabetes. Within this study, the group average A1c (TS Diagnostic A1C Now) levels of the participants were in the prediabetic range on entrance. For the Med7 dosed group, the group average level of A1c dropped significantly when measured at the 90-day mark (Table 3 and Figure 9).



Normal Homocysteine 4-15umol/L
Figure 8: Homocycteine group average values on Day 0 and Day 60 (Med 7 change p value=0.02).



A1c values: normal <5.7; 5.7≤ prediabetic ≤6.4; diabetic >6.5
Figure 9: Hemoglobin A1c group mean values for the Med7 Group on Day 0 and Day 90 (p value=0.02).

Conclusion

The study patients on Med7 reported less Anxiety and less joint pain. In the blind randomization of this study, more subjects with reports of pain were placed in the Med7 Study Product Group which may have produced the slightly higher average Day 0 values for markers of inflammation. Within the Med7 Group, inflammatory markers including TNF and IL-6 showed statistically significant reductions indicating Med7 had a measurable and positive anti-inflammatory effect.

Cardiovascular markers such as HDL and LDL showed measurable improvements as well in the Med7 study group. Significant results were also found in reducing levels of both HbA1c and homocysteine. A1c on average was reduced nearly 1.0 mmol overall in this brief study indicated utility in potentially controlling patients with pre-diabetes from advancing fully to a diabetic state. Further studies are needed to verify and assess the extent and potential of Med7 to affect A1c and homocysteine in the long term and the relationship of the endocannabinoid receptors effect on the endocrine system which was approached here. The correlation between inflammatory markers like homocysteine and A1C have not been conclusive yet it is recognized both large and small vessel diseases including macular degeneration, hypertension and cardiovascular disease may be affected independently by both.

Importantly the first goal of this study was to evaluate the safety, of providing on a daily extended basis Hempzorb81™, documenting any signs of toxicity on digestive, respiratory, cardiac, neuromotor or psychological function. Further, there were no reported untoward effects of any type reported by subjects for the length of the study. Therefore, we conclude that Full Spectrum Hemp Oil (Med7) was shown by our empirics and clinical oversight to be a safe and effective formulation in this Pilot study. This Pilot Clinical Study, though not powered sufficiently to definitely answer the various biomarker clinical responses to Med7, it has provided interesting observations that would benefit from a full Phase II Clinical Trial. For studies looking at markers of inflammation, this preliminary study suggests that it would help to include these within the randomization protocol.

Acknowledgement

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References

1. Mechoulam R, Parker LA, Gallily R. Cannabidiol: an overview of some pharmacological aspects. J Clin Pharmacol. 2002;42(S1):11S-19S.
2. Sunda F, Arowolo A. A molecular basis for the anti-inflammatory and anti-fibrosis properties of cannabidiol. FASEB J. 2020;34(11):14083-92
3. Chayasirisobhon S. The Role of Cannabidiol in Neurological Disorders. Perm J. 2021;25:20.156.
4. Iuvone T, Esposito G, Filippis DD, Scuderi C, Steardo L. Cannabidiol: a promising drug for neurodegenerative disorders? CNS Neurosci Ther. 2009;15(1):65-75.
5. Hartsel JA, Eades J, Hickory B, Makriyannis A. Cannabis Sativa and Hemp. In: Nutraceuticals; Elsevier: Amsterdam, The Netherlands, 2016; pp.735-54.
6. Jin D, Dai K, Xie Z, Chen J. Secondary Metabolites Profiled in Cannabis Inflorescences, Leaves, Stem Barks, and Roots for Medicinal Purposes. Sci Rep. 2020;10(1):3309.
7. Christensen C, Rose M, Cornett C, Alleso M. Decoding the Postulated Entourage Effect of Medicinal Cannabis. What It Is and What It isn't. Biomedicines. 2023;11(8):2323.
8. Sorensen C, Montgomery M, Smith M. Micelle Preparations of Full-Spectrum Hemp Oil, UA 12,011,470 B2, Jun.18,2024.
9. Masters E, Vontrap DA, Dente M. Human Cannabinoid Pharmacokinetics Product: Purzorb® full Spectrum CBD Oil (Hempzorb81TM).
10. Bergamaschi MM, Queiroz RH, Zuardi AW, Crippa JAS. Safety and side effects of cannabidiol, a Cannabis sativa constituent. Curr Drug Saf. 2011;6(4):237-49.
11. Licht RW, Jensen J. Validation of the Bech-Rafaelsen Mania Scale using latent structure analysis. Acta Psychiatr Scand. 1997;96(5):367-72.
12. Aday AW, Duran EK, Vanenburgh M, Kim E, Christen WG, Manson JE, et al. Homocysteine Is Associated with Future Venous Thromboembolism in 2 Prospective Cohorts of Women. Arterioscler Thromb Vas Biol. 2021;41(7):2215-24.
13. van Meurs JB, Dhonukshe-Rutten RA, Pluijm SM, van der Klift M, de Jonge R, Lindemans J, et al. Homocysteine levels and the risk of osteoporotic fracture. N Engl J Med. 2004;350(20):2033-41.
14. Smith AD, Refsum H, Bottiglieri T, Fenech M, Hooshmand B, McCaddon A, et al. Obeid R. Homocysteine and Dementia: An International Consensus Statement. J Alzheimers Dis. 2018;62(2):561-70.