

Impact of THC on Dietary Intake of Cannabinoid Acids

Cannabis as a Unique Functional Food

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Introduction

In the last half of life the inflammatory arm of the immune system takes on characteristics of an autoimmune disorder for which the Conditionally Essential Cannabinoid Acids / CECA's provide unique prophylactic and therapeutic relief.

Cannabinoids remediating affect on diabetes, cancer, autoimmune disorders and ischemic conditions qualify them for recognition as Essential Cannabinoid Acids across the entire life span.

Cannabis a unique functional food if used in its natural state, daily, provides benefits in excess of nutrition. Extensive cannabinoid patents and scientific literature establish the dietary value of cannabis. The psychoactive side effect of 10 mg of THC stops the comfortable ingestion of 500 mg THCA.

6,630,507, October 7, 2003, *Cires 12 Us Patents, 10 Foreign Patents And 26 Articles And Publications Assignee: The United States Of America As Represented By The Department Of Health And Human Services*

23. *The Method Of Claim 22 Where The Compound Is Cannabidiol.*

24. *The Method Of Claim 22, Wherein The Ischemic Or Neurodegenerative Disease Is An Ischemic Infarct, Alzheimer's Disease, Parkinson's Disease, And Human Immunodeficiency Virus Dementia, Down's Syndrome, Or Heart Disease*

6,410,588, June 25, 2002, *Feldmann , Et Al. The Term Isolated Is Intended To Include A Naturally Occurring Cannabinoid Which Has Been Purified From A Natural Source Or One Which Has Been Chemically Synthesised. Preferably The Cannabinoid Is Used As An Anti-Inflammatory Agent Against Inflammatory Diseases, Especially Rheumatoid Arthritis Or Crohn's Disease, Sarcoidosis, Asthma, Alzheimer S Disease, Multiple Sclerosis, Psoriasis, Ulcerative Colitis, Osteoarthritis Or Spondyloarthropathy (Erg. Ankylosing Spondylitis)*

Nutritional Features of Cannabis

Essential Amino Acids/ EAA's:

Edestin a highly digestible protein with balanced Essential and Conditionally Essential Amino Acids
Essential Fatty Acids/ EFA's: Cannabis provides the ideal ratio of the 3-5 omega6:3
Conditionally Essential Cannabinoid Acids: Cannabis is the sole source

Terpenes:

Diverse immunologic, antimicrobial and anti-proliferative actions including allosteric modulation of cannabinoid receptors

Flavonoids:

With diverse action including binding to the 1a and 2a post-synaptic serotonergic receptors

Anti-Microbials:

Recently identified anti-leishmanial and anti-mycobacterium intracellulare activity specifically address the potential detrimental effects of daily use of a potent antioxidant such as CBD. Cannabis provides an incredible synergism available only from consumption of the whole plant.

Clinical Review:

In Mendocino and Humboldt Counties of California, 7,514 patients have been seen in review of their use of cannabis. Based on patient report the initial non-psychoactive use of cannabis was as dry leaf capsules t.i.d. for migraines. After ICRS 2008 this was switched to juiced fresh leaf to improve access to the cannabinoid acids and terpenes. In October 2009 fresh mature bud was added to the leaf and juiced. A 43 year WM with 30-year history of working in construction was evaluated as being bone on bone at both hips and knees and was told he would need joint replacements. He presented with classic use of heat to decarboxylate THCA into THC. Heat increases THC from 90 µg/ml to 10,060 µg/ml. This sweeping conversion from negligible THC into clinically effective THC is done at the expense of reducing the 14,500 µg/ml of THCA found in the unheated plant into the 150 µg/ml of residual THCA in the heated plant and reducing the total tolerable antioxidant dose to 1/50th the origin dose.

The biggest drawback to steeping, sautéing, baking, smoking or vaporizing cannabis is that the THC generated creates a marked reduction in the THCA/CBDA dosage. The THC tolerant individual adjusts their smoking behavior to limit their ingestion to 10 mg. The amounts of THCA present in cannabis range from 16-17% w/w or 72 gm THCA/lb or 4.54 gm THCA/ounce or 162 mg/gm of cannabis. Complementing the THCA, CBDA is present at 1.0% CBD w/w or 4,500 mg/lb in Northern Lights, a common strain.

New strains at 5% CBD w/w provide 22,700 mg/lb. Current "Effective oral human dosage ranges for cannabidiol are contemplated to vary from about 1-40 mg/kg. for example 5-20 mg/kg, and in particular a dose of about 20mg/kg of body weight." US 6,630,507 Column 20, Line 29. However even at 5 mg/kg, CBD blocks the development of diabetes in 58% of NOD mice, a genetically driven model that normally develop diabetes in 86% of the mice. A dose of 5 mg/kg works out to be 250 mg for a 50 kg individual and a 500 mg for a 100kg individual.

Discussion:

Autocrine and paracrine modulation of cellular physiology, resource management and remediation of sub-clinical and clinical pathophysiology has been the domain of Eicosanoid chemistry for billions of years. The arachidonic cascade includes the prostaglandins, leukotrienes, thromboxanes and the encannins (endogenous cannabinoids). Broad host virus transduct plasmid host DNA between plants, animals and bacte-

ria accounting for the lateral co-evolution of Endo/Exogenous Cannabinoids. Billions of years of single cell resource management, symbiotic, and endosymbiotic evolution culminated in multi-cellular life forms all of which were catalysed by the locally acting lipid messenger molecules. While the immunologic recognition of self / non-self is at the core of detecting foreign pathogens and pre-cancerous growth, regulatory access to this system is granted through the broad host virus domain to allow botanical partners to bind to orthosteric and allosteric sites on receptor molecules that modulate immunologic efficacy. As the life span increased from 3 to 9 decades through improvements in infant survival, agriculture and control of infectious pathogens the inflammatory system became over active secondary to accumulative traumatic and degenerative changes eventually the inflammatory system takes on characteristics of an autoimmune disorder. Cannabis is the sole source of a patented lipophilic anti-oxidants and neuroprotectants, a broad terpenoid profile with complementary immunologic activity as well as altering CB2 binding affinity through allosteric modulation. In addition cannabis is the unique source of the essential cannabinoid acids that aid in down regulation of the inflammatory arm of the immune system, mitigating oxidative associated diseases ranging from diabetes, cancer, CNS and myocardial degenerative and ischemic conditions and autoimmune disorders. The FDA approval of CBD as an IND at 600 mg/day mirrors DHHS effective oral human dosage schedule, inclusion of THC reduces tolerable dosage to < 10 mg.

Dietary Labeling:

Nutritional labeling uses Daily Values also called Reference Daily Intake values based on Recommended Dietary Allowances / RDA's last updated in 1968. RDA's meet the needs of 97-98% of the population. EAR or Estimated Average Requirements are set to be sufficient to meet the needs of 50% of the population. Adequate Intake or AI is an estimate of an unknown RDA. To further complicate nutritional nomenclature in 1997 IOM developed the Dietary Reference Intake / DRI which is not yet in common usage. When Upper Limits (UL) have not been established or determined it is recommended that use be limited to whole food to prevent potential adverse effects from excessive intake. Based on current research Adequate Intake of the Conditionally Essential Cannabinoid Acids ranges from 250 to 500 mg/day, supported by FDA approval of CBD as an IND at 600 mg/day in divided doses. In acute ischemia cannabinoid dosages range from 1-2,000 mg/day. The psychoactive effects of 10 mg of THC restricts the dose of THCA / CBDA to negligible levels, markedly below the proposed AI. ❖