Benefits of CBD and our Endocannabinoid System
Presented by Jenny Dull-Frost L.Ac.
WOMEN'S WELLNESS EXPO
10/20/2019

History

- Historically, marijuana dates back to 2000BC in humans and animals.
- Prohibition in mid 20th century halted cannabis research and the importance of hemp and its active components.
- 1990s: "The Father of Cannabinoid Research" Dr. Raphael Mechoulam at Hebrew University in Jerusalem-- medical discovery of the endocannabinoid system (ECS), THC, and two endocannabinoids: anandamide and 2-AG.
- Dec.2018 hemp was removed from control substances act
- The health discovery of the ECS as a master regulator of all physiological functions in our body plus the hemp phytcannabinoids to support this system, brings a new paradigm shift for our health

Definitions

Cannabis sativa plant species for hemp and marijuana

THC: tetrahydrocannabinol—psychoactive/intoxicating effect in brain and body, molecule that attaches to the CB1 receptor in brain

Hemp: used to make clothing, rope, seed oil/seeds, hemp-derived CBD are legally required to contain less than .3% THC

- CBD is one of 100+ phytocannabinoids present in hemp that are equally important in effectiveness in addressing certain health conditions (CBG, CBC, CBN, BCP are a few)

Cannabis: usually insinuates THC portion of the plant, but also includes hemp's CBD and over 100 other cannabinoids

CBD: cannibidiol—a phytocannabinoid found in cannabis plant, non-intoxicating, calming, anti-inflammatory, etc. functions

Phytocannabinoid: active compounds found in cannabis/hemp: CBD+100 more in hemp (external cannabinoid from plant)

Endocannabinoid: cannabinoid produced in the body: Anandamide and 2-AG (internal cannabinoid in body)

Endocannabinoid receptors: CB1 and CB2

Endocannabinoid system (ECS) Body Balancer

Endocannabinoid synthesis is an adaptive response to cellular stress, aimed at reestablishing cellular homeostasis.

PubMed search results for "endocannabinoid"
• 1993: 10 citations
• 2017: 8425 citations

- Modulates energy and well-being, master regulatory system

- Brings body back to homeostasis when there is stress, injury, disease

Robert Melamed, PhD "Think of the ECS as the taskmaster, it is always adjusting the complex network of our molecular thermostat that controls our physiological tempo." The conductor

How can one herb treat so many conditions? ECS

- ECS has connection to: sleep, stress and anxiety, pain and inflammation, exercise, cancer cells, gut, brain, immunity, bone health, neurological health, microbiome connection for digestive health, eye health

- The Endocannabinoid system is a complex network of cannabinoids we produce (endocannabinoids Anandamide and 2-AG) and the cannabinoid receptors that accept them (CB1 and CB2).

- ECS synchronizes adaptation and recovery from the daily insults of life by activating these endocannabinoids:

Anandamide (N-arachidonoyl ethanolamine) the bliss molecule

- A neurotransmitter that attaches to CB1 and CB2 receptors: same receptors in brain that THC attaches and exerts its consciousness effects but does not have psychoactive effect.
- Molecule that has the positive effect on our mood, feelings, perceptions which helps with anxiety, depression, PTSD, etc.
- Why aren't we blissful all of the time? We become deficient due to life demands from stress, inflammation, anxiety, etc. and as the body needs anandamide, we have less and less unless we supplement with full spectrum organic hemp-derived CBD.
- Anandamide foods: Dark chocolate, truffles, flavenoids in apples, tomatoes, broccoli

2-AG (arachidonoylgycerol) the work horse

- A neurotransmitter that attaches to CB1 and CB2 receptors
- More prolific than anandamide and influences immunity, modulates inflammation, insulin sensitivity, helps memory and learning, neuroprotective, pain signaling, mood, stress, anxiety, etc.
- B-amyrin—active component of Boswellia helps increase 2-AG tone

Endocannabinoid deficiency

- Deficiency in anandamide and 2-AG levels has been shown in research to contribute to fibromyalgia, migraines, Alzheimer's, diabetes, stress and anxiety conditions, inflammation, heart disease, PTSD, depression, digestive inflammation, and neurological conditions

In human studies, ECS deficiencies have been implicated in:
– Schizophrenia
– Migraine
– Multiple sclerosis
– Huntington's
– Parkinson's
– Irritable bowel syndrome
– Anorexia

– Chronic motion sickness
– Fibromyalgia (Dunnett, 2007)
– Menstrual symptoms (Dunnett, 2007)
- (reviewed in McPartland, 2014 and Russo, 2004)

Endocannabinoid Receptors: CB1 and CB2 (most researched)

- Binding site on cells for the endocannabinoids we produce: Anandamide and 2-AG
- Receptors are proteins that act as doorways on the surface of cells for messengers to deliver information into the cell
- Researchers have found more endocannabinoid receptors in our bodies than the neurotransmitter receptors of serotonin, GABA, dopamine, etc.
- CB1 and CB2 regulate neurotransmitter release which helps maintain balance in the body with mood, inhibits pain pathway signaling, appetite signaling

CB1: cannabinoid receptor 1
- Abundant in the brain: Regulates pain signaling, memory, movement, motor control, many neurological functions
- Reside in the cardiovascular, digestive tract, heart, liver, lungs, immune system

CB2: cannabinoid receptor 2
- Found in brain, immune system, bones, spleen, liver, pancreas
- Functional roles in immune modulation, bone mass, brain protection, pain and inflammation control, healthy stress response

Cannabinoids - Endogenous

2-Arachidonoylglycerol (2-AG)
• High levels in CNS (much greater than Anandamide)
• Neuromodulator
• 2-AG made from Omega-6 fatty acids
• 2-AG also found in animal/human breast milk
• Anandamide is a neurotransmitter - chemical signaling messenger across neural synapses

Cannabinoids - Exogenous

• THC - Psychoactive
• CBD -Non-Psychoactive
• 150+ types of cannabinoids

CBD Mechanism of Action

- Antagonizes CB1 & CB2 Agonists: Inhibits activity of fatty amide hydrolase (FAAH) and numerous other enzymes
- Allosteric modulation of CB1
- Non-competitive inverse agonist
- (Zhornitsky & Potvin, 2012; Laprairie et al. 2015; Morales et al., 2016)

How do ECS and phytocannabinoids benefit our health?

Health Conditions Influenced by Cannabinoids

ADD/ADHD
ALS
Alzheimer's
Anorexia
Anxiety
Diabetes
Depression
Epilepsy Fever
Fibromyalgia
Glaucoma
Neuralgia
Neuropathy
Parkinson's
PMS
PTSD
Asthma
Ataxia Bipolar
Cachexia
Cancer
Chronic fatigue
Chronic pain
Cramps Crohn's
Hepatitis
HIV/AIDS
Incontinence

Insomnia
Migraine MRSA
Multiple Sclerosis
Nausea
Rheumatoid Arthritis
Seizure disorders
Sickle cell anemia
Spasms
Spinal injury
Stroke
Tourette's
Vomiting

Pain and Inflammation

- NSAIDs and opioid addiction: big problem! We need an anti-inflammatory lifestyle: Acupuncture, chiropractic techniques, movement therapies, herbs, energy work, exercise, CBD, meditation, healthy eating are our answers!
- Support the ECS via these methods as well as exogenous CBD

Pain Management

• Study: The Spine Journal (1 in 5 using CBD for pain w
90% moderate to significant reduction
• chronic management
• neuropathic pain
• affects perception of pain
• mitigates inflammatory process

CBD treats symptoms of Opioid withdrawal

• Nausea, vomiting, diarrhea, cramping
• Muscle spasm
• Anxiety, agitation, restlessness
• Insomnia
• Runny nose, sweating

Gut-Brain-Immunity

- Regulates gastrointestinal motility, controls nausea and intestinal inflammation, hunger signaling

- Anandamide maintains immune health in the intestinal tract by regulating inflammation and negative effects of gut permeability (leaky gut)
- ECS controls the connection of the vagus nerve from brain to gut, which helps to calm anxiety, "gut feelings," emotions and eating

Neuroprotection

- Epilepsy - 'Cannabidiol exerts anti-convulsant effects in animal models of temporal lobe and parietal seizures (2012)
- Multiple Sclerosis - 'Cannabidiol inhibits pathogenic T cells decreases, spinal microglial activation and ameliorates multiple sclerosis-like disease in c57BL/6 mice (2011)
- Bi-Polar - "Cannabidiol in bipolar affective disorder a review and discussion their therapeutic potential" (2005)
- Schizophrenia - 'Cannabidiol a Cannabis native constituent as an antipsychotic drug' (2008)
- Cancer - 'Cannabidiol - recent advances' (2007)
- Inflammation - 'Cannabinoids, Endocannabbinoids and Related Analogs in Inflammation' (2008)

Drug Interactions

Use caution in patients who are taking:

– Warfarin (check INR, usually not significant change)
– Statins
– Erythromycin, Azole antifungals
– Stimulants (works well for some, can increase paranoia and psychiatric side effects in others)
– Anticholinergics: medications for overactive bladder, COPD, Parkinson's, common examples: Celexa, Cymbalta, Benadryl

What to look for in CBD?

"Entourage Effect" Full-Spectrum Whole plant, not just CBD and THC

- CBD isolates do not have a whole body health effect; we want the whole plant's phytochemicals (terpenes, flavenoids, cannabinoids:

hundreds of them) in our supplementation to work in concert with each other
- ALL the cannabinoid molecules need each other to work properly, as nature designed/evolved to be.
- Organic full-spectrum hemp-derived CBD: hemp is a bio-accumulator, meaning it absorbs heavy metals and chemicals from soil, so organic is key
- Grown in the Earth, Under the Sun
- Non-GMO

Delivery Methods

Oromucosal (mouth spray: tincture, oil)
– Strength: intermediate onset, easy dose titration
– Weakness: variable onset and effects if swallowed vs held in mouth, not fast enough onset for some conditions, oral sting/sores may occur
Clinical Utility: broadly applicable

Ingesting (capsules, edible, tincture if swallowed)
– Strength: convenient, long duration
– Weakness: erratic bioavailability, slow onset, digestions variable, most common to be used inappropriately and to cause adverse effects
Clinical Utility: baseline dosage, insomnia

Topical (salves, liniments)
– Strengths: non-psychoactive at most doses, pain, rash, anti- inflammatory, muscle-relaxant
– Weakness: little research
– Clinical Utility: eczema, psoriasis, arthritis, trigger points

Transdermal (patch)
– Strengths: convenient, likely high bioavailability, low abuse potential
– Weakness: slow onset, may be difficult to achieve correct dosage
– Clinical Utility: pain, need for consistent dosing

Rectal
– Strengths: potentially higher bioavailability and faster onset than oral with less psychoactive effects, avoid first-pass metabolism
– Weakness: inconvenient, formulation can affect absorbability
- Clinical Utility: end-of-life, pelvic and low back symptoms

Liposomal: phospholipid encapsulation
Strengths: fast acting, highly absorbable, stable components
Best delivery system for absorption

Ingredients/Dosing

- Minimum ingredients: hemp oil, MCT oil, coconut oil carriers, essential oils for taste, herbs depending on company (keep separate for now)
- Dosing: start at minimum dose: 10mg morning and night for 2 weeks, then increase dose slowly if you feel no effect
- Format of CBD: sublingual oil is easily absorbable, can control the dose
- Many reputable companies: look for clear labeling with third party testing, gives CBD mg/dose
- If you only want CBD, look for .3% THC labeled

Testing

• Potency, spectrum of Cannabinoids
• Terpene Profiling
• Flavonoid Profiling
• Pesticide Screening
• Residual Solvents
• Heavy Metal Testing
• Mycotoxins Analysis (mold)

References:

Road to Ananda Carl Germano, CNS, CDN
Healing with CBD Eileen Konieczny, RN
Robert Melamed, PhD
Dr. LeTa Jussilia