HP Groups

Diabetes & Metabolic Syndrome Journal

Preliminary Research

CBD Water and Diabetes

Antoine Chevalier*

Department of Natural Health, University of Natural Health, Indianapolis, IN, USA

Current marijuana use is associated with lower odds of metabolic syndrome across emerging and middle-aged US adults [1]. Cannabidinoids are components of the Cannabis sativa (marijuana) plant that have been shown capable of suppressing inflammation and various aspects of cell-mediated immunity [2]. Cannabidiol (CBD) and (CBG), non-psychoactive cannabidinoids, have been previously shown to suppress cell-mediated autoimmune joint destruction in a model of rheumatoid arthritis [3]. CBD treatment significantly reduces the incidences of diabetes in research mice from an incidence of 86% in non-treated control mice to an incidence of 30% in CBD-treated mice [2]. CBD treatment also resulted in a significant reduction of plasma levels of the pro-inflammatory cytokines [2]. Histological examination of the pancreatic islets of CBD-treated mice revealed significantly reduced insulitis. Results further indicate that CBD can inhibit and delay destructive insulitis and inflammatory cytokine production in mice, resulting in a decreased incidence of diabetes possibly through an immunomodulatory mechanism shifting the immune response [2].

Endocannabinoids (ECs) are defined as endogenous agonists of cannabinoid receptors type 1 and 2 (CB1 and CB2). ECs, EC anabolic and catabolic enzymes, and cannabinoid receptors constitute the EC signaling system. This system participates in the control of lipid and glucose metabolism at several levels, with the possible negative endpoint being the accumulation of energy as fat. Following unbalanced energy intake, however, the EC system becomes unregulated, and in most cases overactive, in several organs participating in energy homeostasis, particularly, in intra-abdominal adipose tissue [4]. This lack of regulation could contribute to excessive visceral fat accumulation and reduced adiponectin release from this tissue, in addition to the onset of several metabolic risk factors that are associated with obesity and type 2 diabetes [5]. This may form the basis of the mechanism of action of CB1 antagonists/inverse agonists, recently developed by several pharmaceutical companies as adjuvants to lifestyle modification for weight reduction, glycaemic control, and dyslipidaemia in obese and type 2 diabetes patients [4].

Of note, these studies have universally failed and the companies have withdrawn them from consideration by the FDA. It appears the adverse side effects are too severe.

The cannabinoid receptors for the CB (1) receptors are deeply involved in all aspects of the control of energy balance in mammals [6]. Initially, it was believed that this endocannabinoid signaling system would only facilitate energy intake. Even more important functions of endocannabinoids and CB (1) receptors in this context may be to enhance energy storage into the adipose tissue and reduce energy expenditure by influencing both lipid and glucose metabolism [6]. Although normally well controlled by hormones and neuropeptides, both central and peripheral aspects of endocannabinoid regulation of energy balance can become unregulated and contribute to obesity, dyslipidemia, and type 2 diabetes, thus raising the possibility that CB (1) antagonists might be used for the treatment of these metabolic disorders [6]. Alternatively, evidence is emerging that some nonpsychotropic plant cannabinoids, such as cannabidiol, can be employed to retard β-cell damage in type 1 diabetes [7].

***Corresponding author:** Antoine Chevalier, Department of Natural Health, University of Natural Health, Indianapolis, IN, USA, Tel: +1 13142793913; E-mail: drantoinechevalier@gmail.com, antoine@healedandhappy.net

Received Date: October 17, 2017

Accepted Date: December 20, 2017

Published Date: December 29, 2017

Citation: Chevalier A (2017) CBD Water and Diabetes. J Diab Meta Syndro 1: 005.

Research into the endocannabinoid 'system' has grown in recent years, with the discovery of cannabinoid receptors and their endogenous ligands, such as anandamide and 2-arachidonoylglycerol (2-AG) [8]. Important advances have been made in the understanding of endocannabinoid transduction mechanisms, their metabolic pathways, and of the biological processes in which they are involved [9]. Recent endocannabinoid studies provide new insights into neural regulation and mammalian physiology. Endocannabinoids have been found to act as retrograde signals: released by postsynaptic neurons, they bind to presynaptic heteroceptors to modulate the release of inhibitory and excitatory neurotransmitters through multiple G-Protein-Coupled Receptor (GPCR)-linked effector mechanisms [9]. Specific insights into the potential role of endocannabinoid-CB1 receptor systems in central appetite control, peripheral metabolism and body weight regulation are the start of clinical application of CB1 receptor antagonists in the management of obesity and its associated disorders [9].

Oxidative stress and inflammation play critical roles in the development of diabetes and its complications. Recent studies provided compelling evidence that the newly discovered lipid signaling system (ie., the endocannabinoid system) may significantly influence reactive oxygen species production, inflammation, and subsequent tissue injury, in addition to its well-known metabolic effects and functions [10]. The modulation of the activity of this system holds tremendous therapeutic potential in a wide range of diseases, from cancer, pain, neurodegenerative and cardiovascular diseases to obesity and metabolic syndrome, diabetes and diabetic complications [10]. There is a therapeutic potential of targeting the endocannabinoid system [11] (Figure 1).

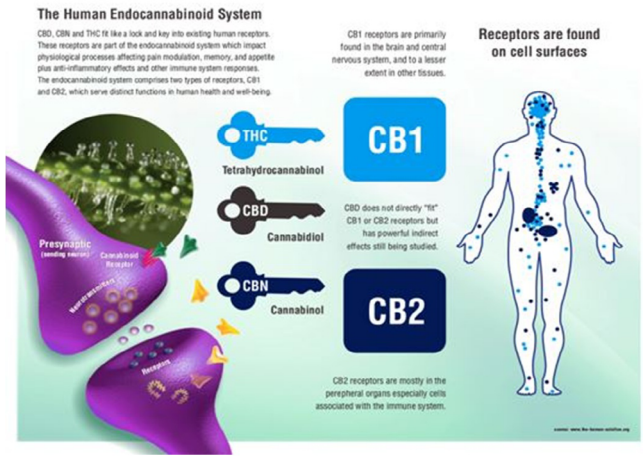

Figure 1: The human endo cannabinoid system.

Certain plant-derived cannabinoids, such as cannabinoid which is devoid of psychotropic effects, have therapeutic potential. They possess potent anti-inflammatory and/or antioxidant properties, in diabetes and diabetic complications.

Recently, products derived from nanoparticles have become more innovative. Specifically, CBD nanohealing has shown success at alleviating ailments such as diabetes [12]. Products such as CBD nanowater are developed by breaking the covalent bonds between hydrogen and oxygen atoms which removes water memory before it is purified through several stages of reverse osmosis filtering. The water is then infused with Cannabinoids (CBD) as well as vitamins" ("Nanoparticle water"). This results in a "highly medicinal supplemental drink particle" ("Nanoparticle water") and can relieve symptoms fast. One must be careful of immediately believing products that say "nano" in them because they could not have gone through the entire rigorous process as described above [11].

This process is legal, as "CBD derived from industrial hemp lawfully cultivated in a state that has enacted an industrial hemp pilot research program. Pursuant to section 7606 of the Farm Act (7 U.S. Code § 5940), legitimacy of industrial hemp research is legal in the state in which the hemp is cultivated" [13,14]. In fact, a patent filed by Weiss et al., in 2007 illuminates the positive effects with the use of CBD. This patent would use CBD to manufacture a medication identified for the treatment or prevention of diabetes and/or insulitis. The patent goes through several possible treatment methods. These include oral administration, a suppository, transdermal administration, nasal inhalation, powder form, etc. A critical point of the patent is that people suffering from diabetes struggle with current forms of treatment. Administering insulin is expensive and time consuming; waiting for a pancreas transplant may take years, and other time consuming or inefficient treatments. Administration of CBD to mice in this study found that the treatment effectively suppressed diabetes and can also help a subject's transplanted pancreatic cells survive [15].

Currently, treatment for diabetes is not a positive experience; it is merely a tolerable treatment. CBD water is a truly innovative treatment because it does not just mitigate symptoms, but improves the overall health of a patient with diabetes. Furthermore, scientific data shows that: Diabetic cardiomyopathy was characterized by declined diastolic and systolic myocardial performance associated with increased oxidative-nitrative stress, nuclear factor-κB and mitogen-activated protein kinase (c-Jun N-terminal kinase, p-38, p38α) activation, enhanced expression of adhesion molecules, markers of fibrosis, enhanced cell death polymerase activity, chromatin fragmentation and diminished Akt phosphorylation. Remarkably, CBD attenuated myocardial dysfunction, cardiac fibrosis, oxidative/nitrative stress, inflammation, cell death and interrelated signaling pathways. Furthermore, CBD also attenuated the high glucose-induced increased reactive oxygen species generation, nuclear factor-κB activation, and cell death in primary human cardiomyocytes. Collectively, these results coupled with the excellent safety and tolerability profile of CBD in humans, strongly suggest that it may have great therapeutic potential in the treatment of diabetic complications and perhaps other cardiovascular disorders, by attenuating oxidative/nitrative stress, inflammation, cell death, fibrosis and pain [11,16].

CBD can be transformed into nanoparticles and transferred to many types of treatments, water and injectables are the aforementioned treatment options. CBD has emerged as an amazing product that can cure ailments such as general achiness due to age, arthritis pain management, anxiety management, better sleep, etc ("CBD Testimonials"). Furthermore, for diabetics, it can relieve symptoms that come with the disease. Additionally, it is also highly preferable to an injection of insulin, constant monitoring, or waiting for a major organ transplant.

Unfortunately, the canon of research on CBD is still limited. Further research is necessary on CBD and the best means of implementation. As noted above the potential of CBD, partically for diabetics, is an emerging field.

References

1. Vidot DC, Prado G, Hlaing WM, Florez HJ, Arheart KL, et al. (2016) Metabolic Syndrome Among Marijuana Users in the United States: An Analysis of National Health and Nutrition Examination Survey Data. Am J Med 129: 173-179.

2. Weiss L, Zeira M, Reich S, Har-Noy M, Mechoulam R, et al. (2006) Cannabidiol lowers incidence of diabetes in non-obese diabetic mice. Autoimmunity 39: 143-151.

3. Nagarkatti P, Pandey R, Rieder SA, Hegde VL, Nagarkatti M (2009) Cannabinoids as novel anti-inflammatory drugs. Future Med Chem 1: 1333-1349.

4. Di Marzo V (2008) The Endocannabinoid system in obesity and type 2 diabetes. Diabetologia 51: 1356-1367.

5. Jung UJ, Choi MS (2014) Obesity and Its Metabolic Complications: The Role of Adipokines and the Relationship between Obesity, Inflammation, Insulin Resistance, Dyslipidemia and Nonalcoholic Fatty Liver Disease. Int J Mol Sci 15: 6184-6223.

6. Di Marzo V, Piscitelli F, Mechoulam R (2011) Cannabinoids and Endocannabinoids in Metabolic Disorders with Focus on Diabetes. Handb Exp Pharmacol 75-104.

7. Pacher P, Batkal S, Kunos G (2008) The Endocannabinoid System as an Emerging target of Pharmacotherapy. Pharmacy Rev 58: 389-462.

8. Bernabo N, Barboni B, Maccarrone M (2013) Systems Biology Analysis of the Endocannabinoid System Reveals a Scale-free Network with Distinct Roles for Anandamide and 2-Arachidonoylglycerol. OMICS 17: 646-654.

9. Kirkham TC, Tucci SA (2006) Endocannabinoids in appetite control and the treatment of obesity. CNS Neurol Disord Drug targets 5: 272-292.

10. Horvath B, Mukhopadhyay P, Hasko G, Pacher P (2012) The Endocannabinoid System and Plant-derived Cannabinoids in Diabetes and Diabetic Complications. Am J Pathol 180: 432-442.

11. Chevalier A (2017) Pain Management and CBD Nano Water. J Anest & Inten Care Med 4: 1-3.

12. Conte R, Marturano V, Peluso G, Calarco A, Cerruti P (2017) Recent Advances in Nanoparticle-Mediated Delivery of Anti-Inflammatory Phytocompounds. Int J Mol Sci 18: 709.

13. Kight R (2017) The Legal Status of Cannabidiol, other Cannabinoids, and Terpenes Derived from Industrial Hemp. Cannabis Law Journal, USA.

14. Weiss L, Zeira, M Mechoulam R Slavin S, Gallily R (2007) Treating or preventing diabetes with cannabidiol. US8071641 B2.

15. Weiss L, Zeira M, Reich S, Slavin S, Raz I, et al. (2008) Cannabidiol arrests onset of autoimmune diabetes in NOD mice. Neuropharmacology 54: 244-249.

16. Ashton JC, Milligan ED (2008) Cannabinoids for the treatment of neuropathic pain: clinical evidence. Curr Opin Investig Drugs 9: 65-75.