CBD and Low THC as an Alternative Therapeutic Aid in Pain Relief

The Central Asian native plant, Cannabis Sativa, is a shrub consumed by an estimated 200-300 million people all around the world as teas, smoke, pills, suppositories, eye drops, oral buccal sprays, and other forms for therapeutic benefits (Gonçalves, J., Rosado, T., Soares, S., Simão, A., Caramelo, D., Luís, A., Fernández, N., Barroso, M., Gallardo, E., and Duarte, A., 2019). Cannabidiol (CBD) is a cannabis derivative without psychotropic effects and has been shown to have a role to play in reducing pro-inflammatory proteins in the brain, such as *TNFA*, *S100B*, and *IL-1B* (Esposito, G., Scuderi, C., Valenza, M., Togna, G., Latina, V., et al., 2011). CBD is a therapeutic being used in research to treat Alzheimer’s disease (AD) and has shown in rats that it stimulates neuronal growth (Esposito, et al., 2011). CBD is also found to have no side effects as an anti-tumor cancer drug in brain tumor gliomas that inhibits the many proteins involved in tumor cell division and spreading from the malignant tumor to healthy brain tissue (Solinas, M., Massi, P., Cinquina, V., Valenti, M., Bolognini, D., et al., 2013). CBD has also been shown to restore gut homeostasis in irritable bowel diseases such as ulcerative colitis (UC) by lowering production of the inflammatory protein S100B and protecting the intestinal wall (De Filippis, D., Esposito, G., Cirillo, C., Cipriano, M., and De Winter, B., et al., 2011).

Tetrahydrocannabinol (THC) is a psychoactive cannabinoid that can cause anxiety, hallucinations, euphoria, and paranoia but when used in varying limited ratios with CBD can have beneficial self-reported effects of helping neuropathic pain, insomnia, anorexia, post-traumatic stress disorder (PTSD), depression, nausea, and spasticity (Casarett, D., Beliveau, J., and Arbus, M., 2019). The treatment of Parkinson disease (PD), fibromyalgia, cancer pain, epilepsy, AD, and Multiple Sclerosis (MS) have shown some instances of benefits to using CBD in combination with THC to manage pain and other symptoms of those diseases (Goncalves, et al., 2019). Users of THC and CBD together in a high THC to CBD ratio have been shown to have higher affinity towards negative psychotherapeutic effects by impairing memory and leading to psychosis (Swift, W., Wong, A., Li, K., Arnold, J., and McGregor, I., 2013).

THC is more lipophilic or fat-loving, therefore it is absorbed more readily than CBD and stores longer in the fat layers of the body. As a topical application for either of these cannabinoids, the CBD version is able to cross the skin barrier better than THC (Gonçalves, et al., 2019). The CB1 and CB2 receptors make up the endocannabinoid system of the body and THC is the only one that directly effects either receptor, particularly the CB2 receptor with its mixed psycho-therapeutic effects (Goncalves, et al., 2019). The CB2 receptors are found in the hematopoietic cells and the immune system of the leukocytes, spleen, and tonsils (Goncalves, et al., 2019). The CB1 receptor is found in the central nervous system (CNS), peripheral nervous system (PNS), some organs like the heart, spleen, digestive tract, urinary tract, reproductive tract, and in the leukocytes and endocrine glands (Goncalves, et al., 2019). CBD does not affect either endocannabinoid receptor but does indirectly affect the CB1 receptor by binding to the in-active sites that the cell membrane channels use to mediate physiological responses like sight, pain, pressure, temperature, and taste (Goncalves, et al., 2019).

Cannabis is still considered a Schedule I drug but has been legalized in many US states and Canada but is authorized to treat medical conditions and for scientific research by international law (Goncalves, et al., 2019).

References

Esposito, G., Scuderi, C., Valenza, M., Togna, G., Latina, V., et al. (2011). Cannabidiol Reduces Ab-Induced Neuroinflammation and Promotes Hippocampal Neurogenesis through PPARc Involvement. PLOS One, 6(12).

Casarett, D., Beliveau, J., and Arbus, M.,(2019). Journal of Palliative Medicine, 22(10).

De Filippis, D., Esposito, G., Cirillo, C., Cipriano, M., De Winter, B., et al. (2011). Cannabidiol Reduces Intestinal Inflammation through the Control of Neuroimmune Axis. PLOS One, 6(12).

Gonçalves, J., Rosado, T., Soares, S., Simão, A., Caramelo, D., Luís, A., Fernández, N., Barroso, M., Gallardo, E., and Duarte, A.(2019). Cannabis and Its Secondary Metabolites: Their Use as Therapeutic Drugs, Toxicological Aspects, and Analytical Determination. Medicines, 6(31).

Solinas, M., Massi, P., Cinquina, V., Valenti, M., Bolognini, D., et al. (2013). Cannabidiol, a Non-Psychoactive Cannabinoid Compound, Inhibits Proliferation and Invasion in U87-MG and T98G Glioma Cells through a Multitarget Effect. PLOS One, 8(10).

Swift, W., Wong, A., Li, K., Arnold, J., and McGregor, I. (2013). Analysis of Cannabis Seizures in NSW, Australia: Cannabis Potency and Cannabinoid Profile. PLOS One, 8(7).