### ****HOW CBD WORKS on Fear, Anxiety and a Healthy Stress Response…..?****

Phytocannabinoids like [cannabidiol (CBD)](https://www.leafly.com/news/health/cannabidiol-101-a-peek-into-cannabinoid-chemistry) are a subclass of cannabinoids derived from plants, typically hemp. In the 1800s, hemp plants were widely cultivated as a fiber source and food in the form of seed oil. Even George Washington grew hemp on his farm in Mount Vernon. Today, worldwide uses of hemp encompass hundreds of consumer products, including ropes, fabrics, paper, plastics and construction materials, and even serve as a source of protein. These same hemp plants are also the major source of [commercial CBD extracts](https://www.leafly.com/news/health/industrial-hemp-derived-cbd-whats-there-to-know), which today are being used to attenuate fear and anxiety and promote a healthy stress response.

How Cannabinoid Receptors Control Stress Response

Cannabinoid receptors (CB1, CB2, TRPV1, GP55 and others) and the biochemical machinery necessary to synthesize and generate cannabinoids are present within areas of the brain known to control emotional behavior, mood, sleep, stress, irritability, fear and even the sensation of “craving.” These structures include the prefrontal cortex, amygdala, hippocampus, nucleus accumbens, and periaqueductal gray (PAG) of the midbrain. Several lines of evidence in mice and other animals have clearly demonstrated that activation of cannabinoid receptors within the brain lowers heart rate and blood pressure responses to stress and reduces panic and anxiety behavior. Put simply, hemp-derived CBD administration appears to attenuate the well-known “fight or flight” phenomenon to physical and mental stress. Other studies using similar models in animals have shown that CBD administration decreases fear-avoidant and conditioned responses to pain or punishment.

In humans, one of the earliest studies to document the beneficial effects of CBD on anxiety was published in 1982 (1). Using a double-blind, cross-over design where each subject served as their own control, eight healthy volunteers were given either 0.5 mg/kg tetrahydrocannabinol (THC), 1 mg/kg CBD, a mixture containing 0.5 mg/kg THC and 1 mg/kg CBD, or diazepam (Valium) as a control. The results showed that CBD blocked the anxiety promoted by THC, indicating antagonism between the two cannabinoids.

In another study using a simulated public speaking test to induce stress, a 300-milligram dose of CBD reduced symptoms of self-rated anxiety (2). Follow-up studies have confirmed and extended these results by reporting significant decreases in cognitive impairment and speech performance in subjects submitted to anxiety induced by several different procedures.

Mapping CBD’s Neurological Effects

Other more elegant studies have used single photon emission computed tomography (SPECT) and functional magnetic resonance imaging (fMRI) to examine changes in regional blood flow and neural correlates of brain activity in response to CBD administration (3,4). Results from these studies, using doses of between 400 and 600 milligrams of CBD, indicate increases in brain activity in the left parahippocampal gyrus and decreases in the left amygdala-hippocampus complex, along with attenuated responses during the recognition of fearful facial expressions in the amygdala and the anterior cingulate. Collectively, these patterns of SPECT and fMRI results are consistent with effects on alleviating anxiety, irritability, fear and stress responses from hemp-derived CBD administration.

Interestingly, a case report was published by Shannon S et al. in the journal *Integrative Medicine*, on hemp-derived CBD oil for decreasing the habitual use of marijuana (5). This case describes the gradual decrease in anxiety (as measured by HAM-A: Hamilton Anxiety Rating Scale) and feelings of stress and irritability from the marijuana non-use, while maintaining normal sleep quality. According to the authors, the use of hemp-derived CBD oil helped in transitioning this patient away from habitual marijuana use while avoiding negative stress responses. The neuronal circuits within the brain that control many of these behaviors and emotions appear to be positively modulated by CBD.

Given the ongoing, emerging human clinical data supporting the use of a hemp-derived CBD-rich extracts for modulating fear, anxiety and a healthy stress response, it looks like good old George Washington was a bona fide hemp pioneer.

References:

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