Cannabidiol Reduces Experience of Pain in Individuals with Chronic Pain.

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Background

Despite the 2019 NIH campaign to address the opioid crisis, over 140 million opioids were prescribed and over 150,000 people died from an overdose in 2020. Since opioids are most commonly prescribed to treat severe pain, it is incredibly important to identify new, readily available interventions that may be used to target chronic pain and opioid use. In the last few years, the United States has witnessed enormous changes concerning public acceptance of cannabinoids (CBD), with survey studies indicating that many individuals are substituting CBD for opiates to alleviate pain. Results from recent RCTs and survey studies have concluded that CBD is an effective tool in the management of chronic pain, opioid craving and opioid use.

Methods

- Individuals with chronic pain enrolled in a randomized, double blind, phase 2 clinical trial assessing the efficacy of CBD in reducing pain and/or opioid medication were recruited and randomly assigned to one of three conditions:
- **Broad-spectrum CBD** [bsCBD, n=46, Mean age (*M*)= 50.65, Standard Deviation (*SD*)=14.76, 80% Female]
- **Full-spectrum CBD** [fsCBD, n=43, *M*=42.56, *SD*=13.85, 79% Female]
- **Placebo** [PL, n=36, *M*=39.00, SD=13.91, 91% Female]
- Participants ingested 210 mg daily oral doses over a 12-week trial period. Pain was assessed at three timepoints via the self-report Pain Catastrophizing Scale.
- Blood cannabinoid levels were collected at each timepoint to assess adherence to trial medication.
- A mixed ANOVA with repeated measures was used to evaluate pain catastrophizing scores across timepoints. Our within-subject factor was time, with repeated measures (Week 0, Week 6, and Week 12). Our between-subject factors was condition, with three groups (bsCBD, fsCBD, PL).

References

CDC. 2021, November 10. United States Dispensing Rate Maps. Retrieved from https://www.cdc.gov/drugoverdose/rxrate-maps/index.html on 2023, October 31.

Hurd YL, Spriggs S, Alishayev J, et al. Cannabidiol for the reduction of cue-induced craving and anxiety in drug-abstinent individuals with heroin use disorder: A double-blind randomized placebo-controlled trial. Am J Psychiatry. Published online 2019. doi:10.1176/appi.ajp.2019.18101191

Lynch ME, Ware MA. Cannabinoids for the Treatment of Chronic Non-Cancer Pain: An Updated Systematic Review of Randomized Controlled Trials. J Neuroimmune Pharmacol. 2015;10(2):293-301. doi:10.1007/s11481-015-9600-6

Quartana PJ, Campbell CM, Edwards RR. Pain Catastrophizing: A Critical Review. Expert Rev Neurother, 2009: 9(5); 745-58.

Sullivan, J. M. (2009). Pain Catastrophizing Scale. https://www.oregon.gov/oha/HPA/dsi-pmc/PainCareToolbox/Pain%20Catastrophizing%20Scale.pdf

Whiting PF, Wolff RF, Deshpande S, et al. Cannabinoids for medical use: A systematic review and meta-analysis. JAMA - J Am Med Assoc. 2015;313(24):2456-2473. doi:10.1001/jama.2015.6358

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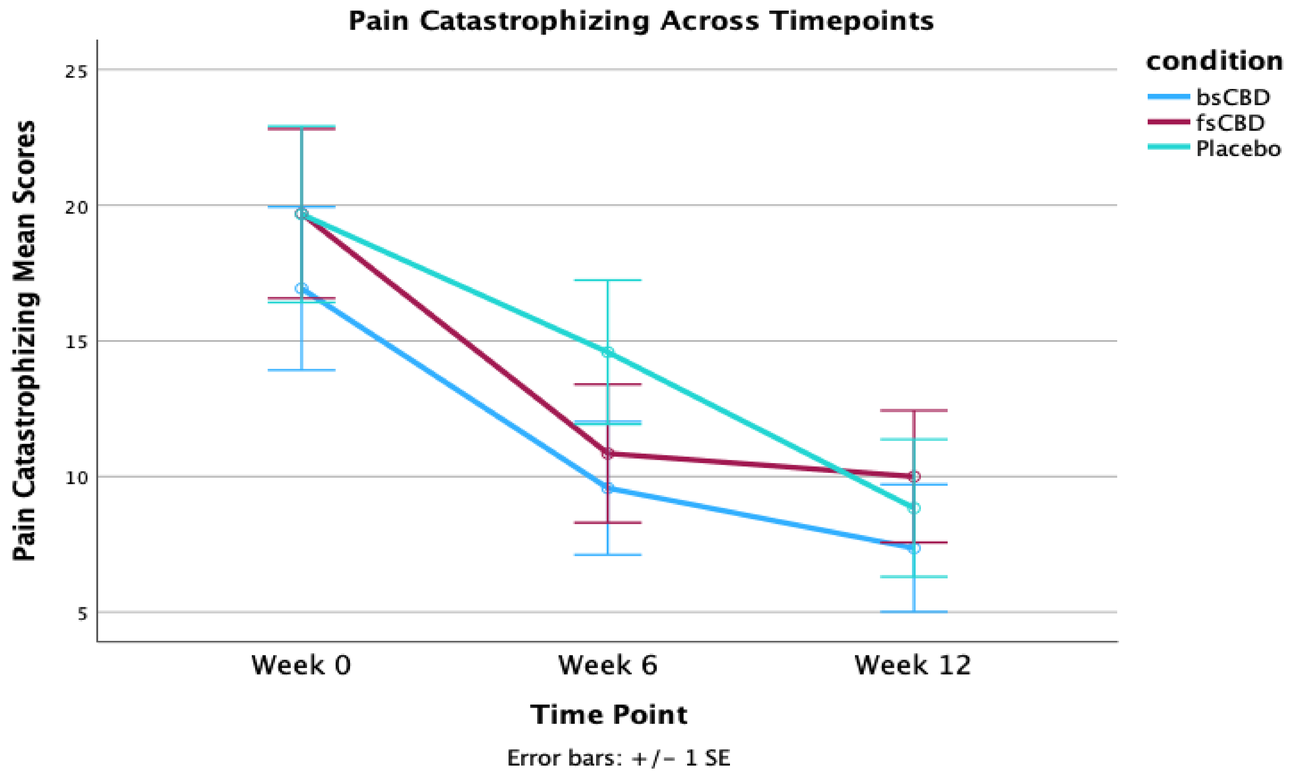

Pain Catastrophizing Scale

- Characterized by the tendency to magnify the threat of a pain stimulus, to feel helpless in the presence of pain, and the inability to prevent pain-related thoughts.
- The PCS quantifies an individual's pain experience by assessing the thoughts and feelings an individual has while in pain.
- The questionnaire includes thirteen statements describing different thoughts and feelings associated with pain, rated from 0-4, with 4 describing the most intense pain experiences.
- Unlike other pain-related measures, the PCS is unique in that the individual does not need to be in pain while completing it.

Results

Although the omnibus test was not significant, pairwise comparisons revealed there was a significant simple effect of time within each condition:

- PCS scores significantly decreased within the bsCBD condition from baseline to week 6 (p=.005) and from baseline to week 12 (p=.002)
- PCS scores significantly decreased within the fsCBD condition from baseline to week 6 (p=.001) and from baseline to week 12 (p=.002)
- PCS scores did not significantly decrease within the placebo condition from baseline to week 6. However, PCS scores did significantly decrease within the placebo condition from week 6 to week 12 (p=.006) and from baseline to week 12 (p=.001)

Conclusion

- Individuals who took CBD reported a significant decrease in pain catastrophizing after taking the study medication for 6 weeks. In contrast, individuals in the placebo did not report a change in pain catastrophizing between baseline and week 6. Consequently, CBD may be considered as a useful tool in helping individuals decrease thoughts and feelings of pain.
- Individuals in the CBD conditions did not report a change in catastrophizing between week 6 and week 12, indicating that the effects of CBD might be strongest at onset, or that individuals developed a tolerance to the CBD.
- Furthermore, individuals in the placebo condition also experienced a reduction in pain catastrophizing across timepoints, demonstrating a possible placebo effect.
- Despite some confounding evidence, these main results describe a significant therapeutic potential in cannabidiol for chronic pain and justify further investigation.