Heterodyned Whole-Body Vibration Ameliorates Anxiety in Opioid-Use Disorder

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Background

Opioid use disorder (OUD) is a rising problem in the United States and around the world, with pain and stress being major factors for initial drug seeking and relapse. The mesolimbic dopamine (DA) in the striatum is an important nexus for the rewarding properties of opioids and other addictive drugs and is strongly implicated in OUD. This study uses a novel heterodyned whole-body vibration (HWBV) device consisting of two independent vibration sources vibrating at different frequencies to treat anxiety/craving associated with OUD.

Picture 1. Stock image from Dreamstime representing different forms of opiates.

Methods

We evaluated 50 patients experiencing anxiety associated with OUD. Twenty-five received HWBV treatment and 25 received a sham treatment. Patients were treated 5 times per week for 10 minutes per day for 4-weeks. Pre- and post-EEG and neuropsychological evaluations were performed. Daily acute anxiety scores were taken, and weekly HAM-A anxiety scales were performed.

Results

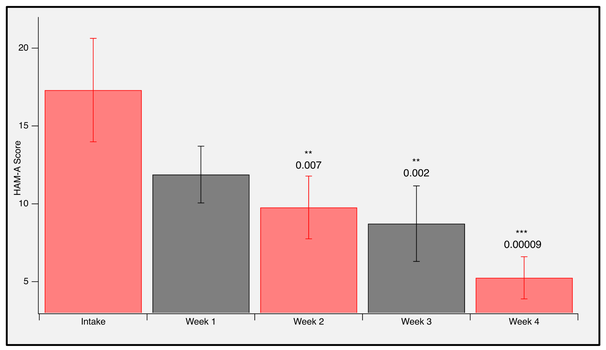


Figure 1. Hamilton Anxiety Score averages by week. All p-values are T-Tests against the intake. Week 1= 0.093, week 2 = 0.006787, Week 3 = 0.002191, Week 4 = 8.62e-05

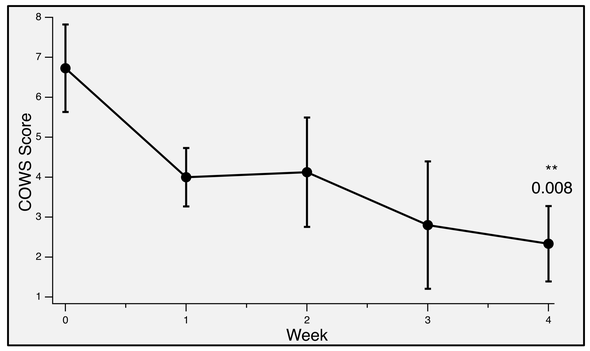


Figure 2. Clinical Opiate Withdrawal Scale Score averages by week. All p-values are T-Tests against the intake. Week 1= 0.074, Week 2 = 0.152, Week 3 = 0.064, Week 4 = 0.00836

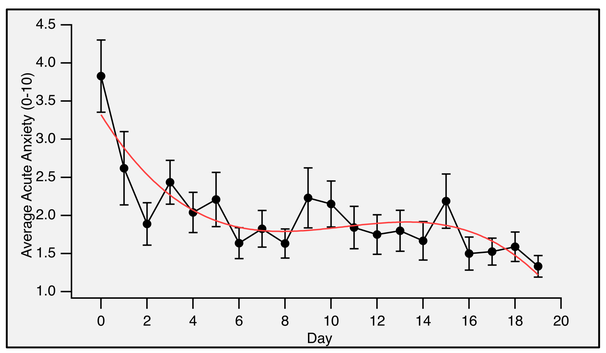


Figure 3. Daily Anxiety Score averages (out of 10) by week. All p-values are T-Tests against the intake. Day 1 = 0.057, all others were less than 0.0033. Notice the increase in Week 2 Day 1 and Week 4 Day 1, right after the weekends. I suspect this is related to not using the chair on weekends.

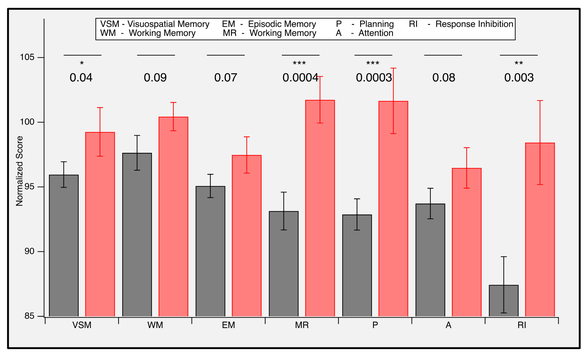
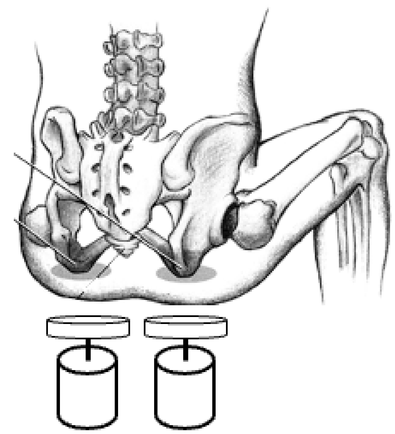


Figure 4. Neurocognitive Scores Before and After Treatment. Changes in patient scores from before to after treatment for migraines. Gray bars represent before treatment, pink bars represent after treatment.

Results Continued

HAM-A scores were significantly reduced in the treatment group when compared to sham (-12.06 versus -3.56; n=50; p=0.0018). Additionally, improvements were noted in Mental Rotations, Grammatical Reasoning and Response Inhibition. Finally, significant positive changes were found in frontal alpha balance on EEG.



Conclusion

This neurocognitive pattern is consistent with long-reported clinician reported observation of chronic migraine patients with high functioning neurocognitive profiles with targeted deficits in effecting memory and emotional affective circuits. These data could provide additional details regarding the role of chronic migraine in neuropsychiatric disorders and possibly provide further insight into prophylaxis and treatment options. However, further research is needed.

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