TRANSCRANIAL INFRARED LIGHT FOR SUICIDAL IDEATION

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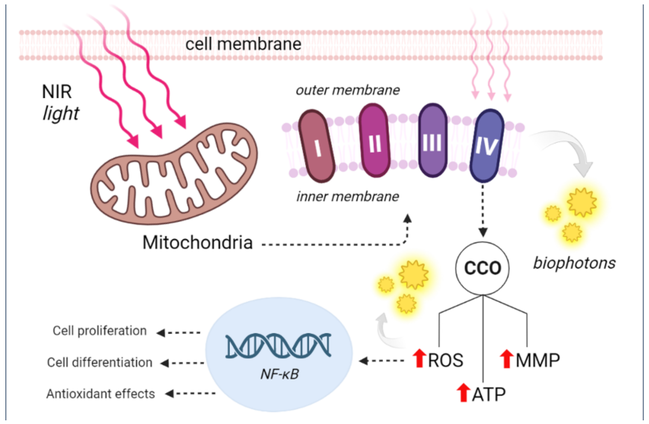
BACKGROUND

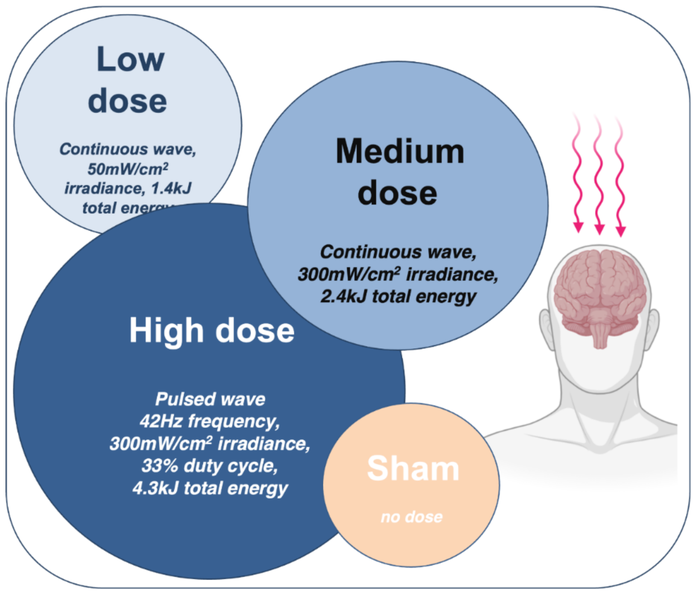
- MDD is a strong risk factor for suicide and depressed mood has been repeatedly associated with suicide risk [1].
- Suicide is considered the 10th leading cause of death in the United States, and the second and fourth leading cause among persons aged 10-34 and 35-44 years, respectively [2].
- In just over 2 decades (1999-2019), more than 800,000 deaths were attributed to suicide [2].
- Sadly, 43% of primary care patients experiencing a six-month depressive episode, with or without suicidal ideation, remain untreated, with most preferring self-management over professional help and/or prescription medications [3].
- Transcranial photobiomodulation (t-PBM) is a novel neuromodulation technique with antidepressant effects, modulating cortical excitability and improving cerebral perfusion by using infrared light [4].
- However, despite promising data, t-PBM benefits for improving suicidal ideation are not yet established.



METHODS

- Subjects: Suicide data were collected from our NIH sponsored TRIADE study, where we tested the effects of t-PBM (808 nm) on improving depressive symptoms in 30 subjects. Subjects were enrolled if they met the following criteria: a) Diagnostic criteria for Major Depressive Disorder (MDD) in the past two weeks, at the DSM-5 Mini-International Neuropsychiatric Interview (MINI) b) Inventory for Depressive Symptomatology Clinician-rated (IDS-C) total score ≥23 at screening. c) Depression symptoms are the primary target of treatment or treatment-seeking.

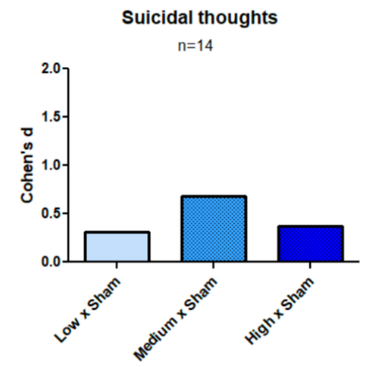
METHODS



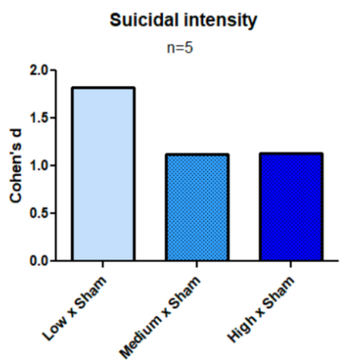
- Study Design: This was single-blind, dose-ranging, sham-controlled study. Raters were blind to dose-week randomization.
- Photobiomodulation treatment: Subjects underwent four randomized, weekly t-PBM sessions with sham and three combinations of t-PBM parameters.
- Outcomes: For measuring suicidal ideation and intensity, we used the Columbia Suicide Severity Rating Scale (C-SSRS), and for suicidal thoughts, we applied the item on suicidal thoughts from the Montgomery-Asberg Depression Rating Scale (MADRS).
- Data Analysis: Statistical analyses were performed using SPSS 29.0 and effect size (Cohen's d) was calculated with means and standard deviations of each dose. Graphics were generated using GraphPad 5.0.

RESULTS

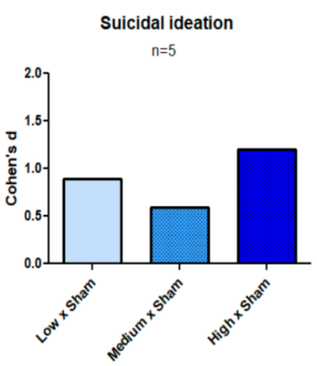
We stratified our sample by excluding participants who did not present with suicidal ideation at baseline. Despite the small sample size after stratification (n=5 for suicidal ideation and intensity, and n=14 for suicidal thoughts), we found medium and large effect sizes (Cohen's d) for all the three doses compared to sham, as it follows:



Doses	Cohen's d
Low x Sham	0.3148
Medium x Sham	0.6803
High x Sham	0.3710



Doses	Cohen's d
Low x Sham	1.8257
Medium x Sham	1.1180
High x Sham	1.1313



Doses	Cohen's d
Low x Sham	0.8944
Medium x Sham	0.5962
High x Sham	1.2000

CONCLUSION

The medium and large effect sizes of all doses (low, medium, and high) demonstrate that t-PBM may be effective for decreasing suicidal ideation. Further analyses with a larger sample size are needed.

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