Photomed Laser Surg. 2017 Aug;35(8):432-441. doi: 10.1089/pho.2016.4227. Epub 2017 Feb 10.

Significant Improvement in Cognition in Mild to Moderately Severe Dementia Cases Treated with Transcranial Plus Intranasal Photobiomodulation: Case Series Report

Anita E Saltmarche [1], Margaret A Naeser [2 3], Kai Fai Ho [4], Michael R Hamblin [5 6], Lew Lim [7]

Affiliations

PMID: 28186867 PMCID: PMC5568598 DOI: 10.1089/pho.2016.4227

Abstract

Objective: This study investigated whether patients with mild to moderately severe dementia or possible Alzheimer's disease (AD) with Mini-Mental State Exam (MMSE) Baseline scores of 10-24 would improve when treated with near-infrared photobiomodulation (PBM) therapy.

Background: Animal studies have presented the potential of PBM for AD. Dysregulation of the brain's default mode network (DMN) has been associated with AD, presenting the DMN as an identifiable target for PBM.

Materials and methods: The study used 810 nm, 10 Hz pulsed, light-emitting diode devices combining transcranial plus intranasal PBM to treat the cortical nodes of the DMN (bilateral mesial prefrontal cortex, precuneus/posterior cingulate cortex, angular gyrus, and hippocampus). Five patients with mild to moderately severe cognitive impairment were entered into 12 weeks of active treatment as well as a follow-up no-treatment, 4-week period. Patients were assessed with the MMSE and Alzheimer's Disease Assessment Scale (ADAS-cog) tests. The protocol involved weekly, in-clinic use of a transcranial-intranasal PBM device; and daily at-home use of an intranasal-only device.

Results: There was significant improvement after 12 weeks of PBM (MMSE, $p < 0.003$; ADAS-cog, $p < 0.023$). Increased function, better sleep, fewer angry outbursts, less anxiety, and wandering were reported post-PBM. There were no negative side effects. Precipitous declines were observed during the follow-up no-treatment, 4-week period. This is the first completed PBM case series to report significant, cognitive improvement in mild to moderately severe dementia and possible AD cases.

Conclusions: Results suggest that larger, controlled studies are warranted. PBM shows potential for home treatment of patients with dementia and AD.

Keywords: Alzheimer's disease; LED; LLLT; dementia; intranasal; photobiomodulation; transcranial.

Figures

FIG. 1. Photographs of Vielight "810" and...

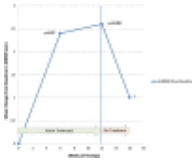

FIG. 2. Mean change from baseline in...

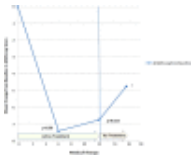

FIG. 3. Mean change from baseline in...

Related information

MedGen

LinkOut - more resources

Full Text Sources

Atypon
Europe PubMed Central
PubMed Central

Other Literature Sources

The Lens - Patent Citations Database
scite Smart Citations

Medical

ClinicalTrials.gov
MedlinePlus Health Information

Molecular Biology Databases

NIAID Data Ecosystem - Find datasets on Infectious and Immune-mediated Diseases