Defense Health Agency (DHA) Clinical Communities Speaker Series

CCSS Aug 2021: Exploration of Innovations in Health Care

S02: Scalp Application of near-infrared LEDs to Improve Cognition in Chronic TBI/PTSD, Dementia, and GWI

Resource List

Gulf War illness (GWI) typically includes some combination of fatigue, headaches, cognitive dysfunction, musculoskeletal pain, and respiratory, gastrointestinal and dermatologic complaints. To date, there has been no effective treatment for this illness. This report, Improvements in Gulf War Illness Symptoms After Near-Infrared Transcranial and Intranasal Photobiomodulation: Two Case Reports (2019), describes the first documentation of improved GWI symptoms in two GW veterans following 12 weeks of photobiomodulation (PBM) treatments – a non-pharmacological, non-thermal use of light to stimulate, heal, and protect tissue

The ongoing pandemic of novel coronavirus (SARS-CoV-2) COVID-19 has cast a dark shadow on the future of the world as we know it. A frantic search for effective treatments is underway to stem the pandemic and give hope to billions quarantined—willingly or unwillingly—worldwide. Light as a potential treatment for pandemic coronavirus infections: A perspective (2020) suggests that phototherapy, a seemingly forgotten treatment for bacterial and viral infections, has immense potential to reduce the impact of COVID-19 pandemic and similar coronavirus infections. Further, it reviews contemporary evidence for this assertion, and offers suggested ways that modern healthcare may integrate readily available inexpensive light technologies in its stash of clinical tools for patients with COVID-19 and other infections.

Chronic pain is a major problem in the USA and the rest of the world, currently, all available pharmacological interventions carry with them significant side effects. Pain clinics are specially equipped to perform intentional pain procedures to manage pain. However, there remain groups of patients what neither benefit from pharmacological nor from interventional pain procedures. Other methods have shown only minor benefits such as hypnosis or cognitive behavioral therapy. Therefore, other techniques need to be investigated. The article, The Effect of Light Therapy on Chronic Pain (2020), looks into light therapy and its known biological effects on humans, how it is used to manage depression and how certain wavelengths of light can improve pain.

Transcranial photobiomodulation to improve cognition in Gulf War illness (2021) followed veterans deployed to the Kuwait Theater in 1990-91. It was noted that 25-30% of 700,000 veterans have developed a persistent multi-symptom illness related to neurotoxicant exposures. To date, treatments developed for Gulf War Illness (GWI) have been insufficient. Interventions addressing underlying pathologies are needed. Photobiomodulation (PBM) is a plausible therapy to address GWI symptoms. PBM consisting of red and near-infrared (NIR) wavelengths of light may impart beneficial effects on mitochondrial and cellular function, immune function, and inflammation, all of which are affected in GWI.

References

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