Acupuncture for Treatment of Persistent Disturbed Sleep: A Randomized Clinical Trial in Veterans with Mild Traumatic Brain Injury and Posttraumatic Stress Disorder

Wei Huang MD, PhD[*†], Theodore M. Johnson II, MD, MPH[**], Nancy G. Kutner PhD[†], Sean N. Halpin MA[@], Paul Weiss MS[ǂ], Patricia C Griffiths PhD[**], and Donald L. Bliwise PhD[#]

Affiliations:

*Atlanta VA Medical Center
Traumatic Brain Injury/Geriatrics, Extended Care, and Rehabilitation Service Line

†Department of Rehabilitation Medicine
Emory University School of Medicine

**Birmingham/Atlanta VA GRECC
Department of Medicine
Division of General Medicine and Geriatrics
Emory University School of Medicine

@Emory Prevention Research Center, Rollins School of Public Health
Emory University

ǂ Department of Biostatistics and Bioinformatics
Rollins School of Public Health
Emory University

Department of Neurology
Emory Sleep Center
Department of Psychiatry and Behavioral Sciences
Emory University School of Medicine

Corresponding Author:

Wei Huang MD, PhD
250 N. Arcadia Avenue
Traumatic Brain Injury/Geriatrics, Extended Care, and Rehabilitation Service Line
Atlanta VA Medical Center
Decatur, GA 30030

ABSTRACT

Objective: To evaluate real acupuncture, as compared to sham, in improving persistent sleep disturbance in veterans with mild traumatic brain injury (mTBI) and post-traumatic stress disorder (PTSD).

Method: This randomized clinical trial (RCT) at a US Department of Veterans Affairs Medical Center included sixty veterans aged 24-55 (mean 40) with history of mTBI of at least 3-months and refractory sleep disturbance. They were randomized into 2 groups and stratified by PTSD status. Each received up to 10 treatment sessions. The primary outcome measure was change in baseline-adjusted global Pittsburgh Sleep Quality Index (PSQI) score following intervention. Secondary outcomes were wrist-actigraphy assessed objective sleep measurements. Comorbid PTSD was analyzed as a covariate.

Results: Mean [SD] pre-intervention global PSQI score was 14.3 [3.2]. Those receiving real acupuncture had a global PSQI score improvement of 4.4 points (relative to 2.4 points in sham, p=0.04), and actigraphically measured sleep efficiency (absolute) improvement of 2.7% (relative to a decrement of 5.3% in sham, p=0.0016). Effective blinding for active treatment was maintained throughout the study. PTSD participants presented with more significant sleep difficulties at baseline; acupuncture was effective for those both with and without PTSD.

Conclusion: Real acupuncture, compared to a sham needling procedure, resulted in a significant improvement in subjective and objective sleep measures for veterans with mTBI and disturbed sleep, even in the presence of PTSD. These results indicate that an alternative medicine treatment modality like acupuncture provides meaningful relief for a particularly recalcitrant problem affecting large segments of the veteran population.

Trial Registration: ClinicalTrials.gov identifier B6924-W

Acknowledgement

The work was supported by a US Department of Veterans Affairs Rehabilitation Research and Development Career Development Award Level II (WH) (B6924W). Appreciation is extended to Dr. David Redden (Alabama VAMC), Dr. Qi Long (Emory School of Public Health), and Dr. Sudeshna Paul (Emory School of Nursing) for assistance with statistical design, subject randomization or preliminary data analysis; Ms. Gwendolyn Agbaere (Atlanta VAMC, Registered Sleep Technologist) for delivery of sleep education; and Ms. Rachel Wolf (Atlanta VAMC, MPH), Ms. Sabrina Ward (Atlanta VAMC, Respiratory Therapist), and Dr. Zobair Nagamia (Emory School of Medicine) for assistance in study coordination.

Financial Disclosure

DLB is a consultant for Merck, Ferring Pharmaceuticals, Jazz Pharmaceuticals, and Respicardia. Other authors have no financial disclosures. TMJ is a consultant for Medtronic and Vantia Therapeutics.

Key Words: acupuncture, sleep, mild traumatic brain injury, PTSD, randomized clinical trial