

Preliminary Observations of Personalized Repetitive Transcranial Magnetic Stimulation (PrTMS®) for mTBI/Concussion

Introduction

Mild traumatic brain injury (mTBI) is generally referred to as concussion, and is chiefly caused by motor vehicle accidents, falls, assaults, and sports-related impacts. Concussion is widespread and in a significant proportion of affected patients it is disabling. There are few treatment options, and the long-held perspective that mild concussion resolves relatively rapidly and without sequelae is being questioned.

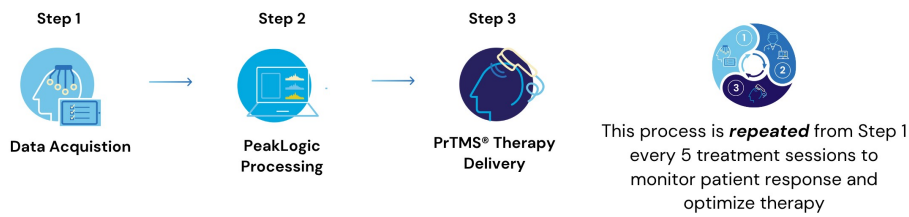
Several reports have related higher rates of depression and dementia with a history of concussion. The lack of FDA-approved treatments and the need for effective treatments has prompted the use of repetitive transcranial magnetic stimulation (rTMS). Treatment with rTMS has shown beneficial activity in concussion, although results have been inconsistent

To address this, we developed a personalized rTMS (PrTMS®) protocol which methodologically aligns with emerging mechanistic data on the pathophysiology of concussion.

Our PrTMS® technique involves continual rTMS stimulus frequency adjustment and progressive activation of multiple cortical sites, guided by spectral electroencephalogram (EEG)-based analyses and psychological questionnaires.

Methodology

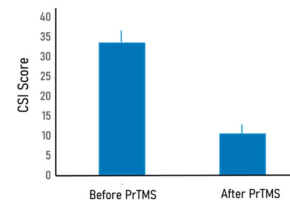
We acquired pilot clinical data for 185 symptomatic brain concussion patients who underwent the PrTMS® protocol over an approximate 6-week period of daily, 5x per week treatment sessions.



The PrTMS® protocol used a proprietary EEG spectral frequency algorithm to define an initial stimulation frequency based on an anteriorly graded projection of the measured occipital alpha center peak, which was then used to interpolate and adjust regional stimulation frequency according to weekly EEG spectral acquisitions.

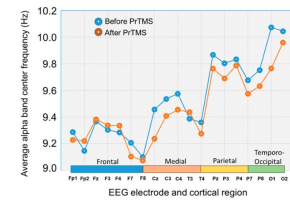
Results

The Concussion Symptom Inventory (CSI) in 56 patients of all ages detected a significant decline in concussion symptoms after PrTMS® was initiated with mean symptoms scores **dropping by almost 70% from 33.5 to 10.5.**



The mean number of treatment days in this group suggested that patients responded rapidly. Only 2 of 56 patients failed to respond, **marking a 96.43% response rate.**

In addition to the reported symptom improvement, a repeated measures ANOVA analyses of spectral EEG data showcased that PrTMS® improved concussion indices and normalized the cortical alpha band center frequency and peak EEG amplitude.



In aggregate, these findings support the pursuit of further prospective studies of PrTMS® for concussion treatment, along with exploration of the spectral EEG as a biomarker of concussion.

PrTMS®
Near You:

You are one of a kind, your treatment should be too.

For more information on PrTMS®, please visit www.prtnms.com

The use and results of personalized rTMS have not been evaluated by the FDA to date. PeakLogic, Inc. owns PrTMS® and the PrTMS® method; all rights are reserved.

Makale, Milan T., et al. "Preliminary Observations of Personalized Repetitive Magnetic Stimulation (PrTMS) Guided by EEG Spectra for Concussion." MDPI, Multidisciplinary Digital Publishing Institute, 9 Aug. 2023, www.mdpi.com/2076-3425/13/8/1179.