



Abstract: 6080

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Interaction between pain and fatigue in veterans with fibromyalgia receiving cranial electrotherapy stimulation

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Introduction

Fibromyalgia (FM) is a chronic disorder characterized by widespread pain, fatigue, and unrefreshing sleep, involving hyperexcitability in pain pathways and altered neurotransmitter signaling. Fatigue in FM encompasses both muscle tiredness and lack of motivation. Given the strong association between chronic pain and fatigue, this study examines the relationship between pain and fatigue in veterans with FM using cranial electrical stimulation (CES). CES is a non-invasive, nonpharmacological, home-based method of applying low-intensity electric current to the brain. It has shown potential benefits in managing FM symptoms.

The primary aim is to evaluate the effect of CES on fatigue in veterans with FM. We (1) evaluated the correlation between fatigue and pain using the PROMIS fatigue and DVPRS scores and (2) analyzed the effect of CES treatment on fatigue over 12 weeks.

Materials and Methods

This study utilized data from a randomized, double-blind, sham-controlled trial of CES in veterans with FM. NIH Patient-Reported Outcomes Measurement Information System (PROMIS) short form v1.0-Fatigue 6a and Defense and Veterans Pain Rating Scale (DVPRS) scores were collected at baseline (timepoint1), 6 weeks (timepoint2), and 12 weeks (timepoint3)

We conducted Pearson correlation analysis to assess the relationship between PROMIS and DVPRS scores. We also used linear mixed model and ANOVA to analyze PROMIS fatigue scores at the 3 time points using within-group comparisons and between-group (true CES vs. sham CES) comparisons.

The study has been approved under IRB 112768 by the Emory IRB.

Results/Case Report

The correlation analysis revealed that as pain scores increased, patients felt more run-down, bothered, and experienced greater interference with physical functioning. At timepoint2, there were significant positive correlations between DVPRS and PROMIS 3 ($r=0.36$, $p=0.02$) and PROMIS 5 ($r=0.40$, $p=0.01$). At timepoint3, significant correlations were found between DVPRS and PROMIS 3 ($r=0.53$, $p=0.001$), PROMIS 5 ($r=0.39$, $p=0.02$), and PROMIS 6 ($r=0.52$, $p=0.002$) (Figure1, Table2). Trends showed a positive correlation between pain and fatigue in non-significant measures.

CES treatment analysis showed a significant decrease in fatigue with increased CES usage (-0.004 decrease in T score per minute usage, $p=0.003$). Only the sham CES group showed a significant decrease in fatigue with increased usage (-0.004 decrease in T score per minute usage, $p=0.004$). There were no significant differences in PROMIS fatigue scores between the true and sham CES groups ($p=0.6$) (Figure2, Table1).

Discussion

The significant findings at timepoints2 and 3 suggest that pain influences fatigue over time, as shown by positive correlations between DVPRS and PROMIS fatigue scores. The significant decrease in fatigue with increased CES usage suggests potential benefits of CES in managing fatigue in veterans with FM. However, the lack of significance between the true and sham CES groups might be due to the small sample size, with non-significant measures showing similar trends. Improvements in the sham CES group might be explained by meditative effects, which were shown to play a role in pain management in FM and contribute to fatigue reduction. Further research with larger sample sizes is needed to confirm these findings, explore alternative interventions, and understand mechanisms linking pain and fatigue in this population.

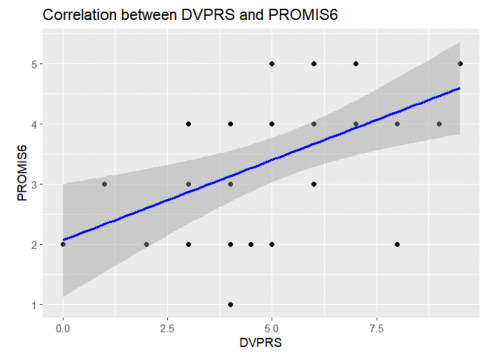
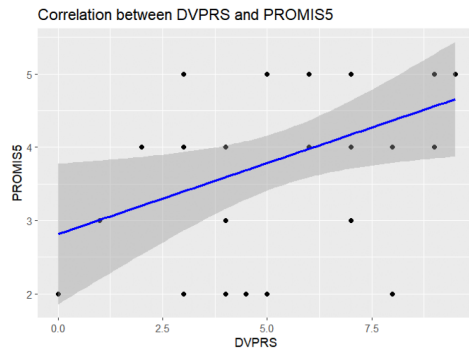
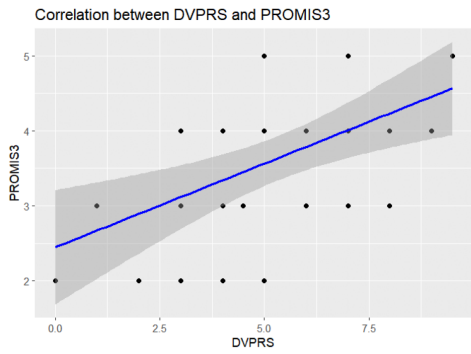
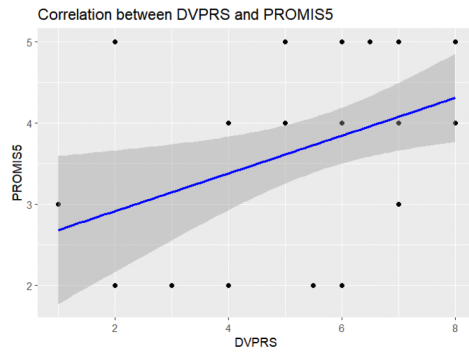
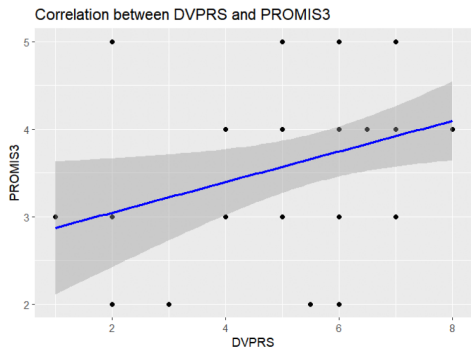
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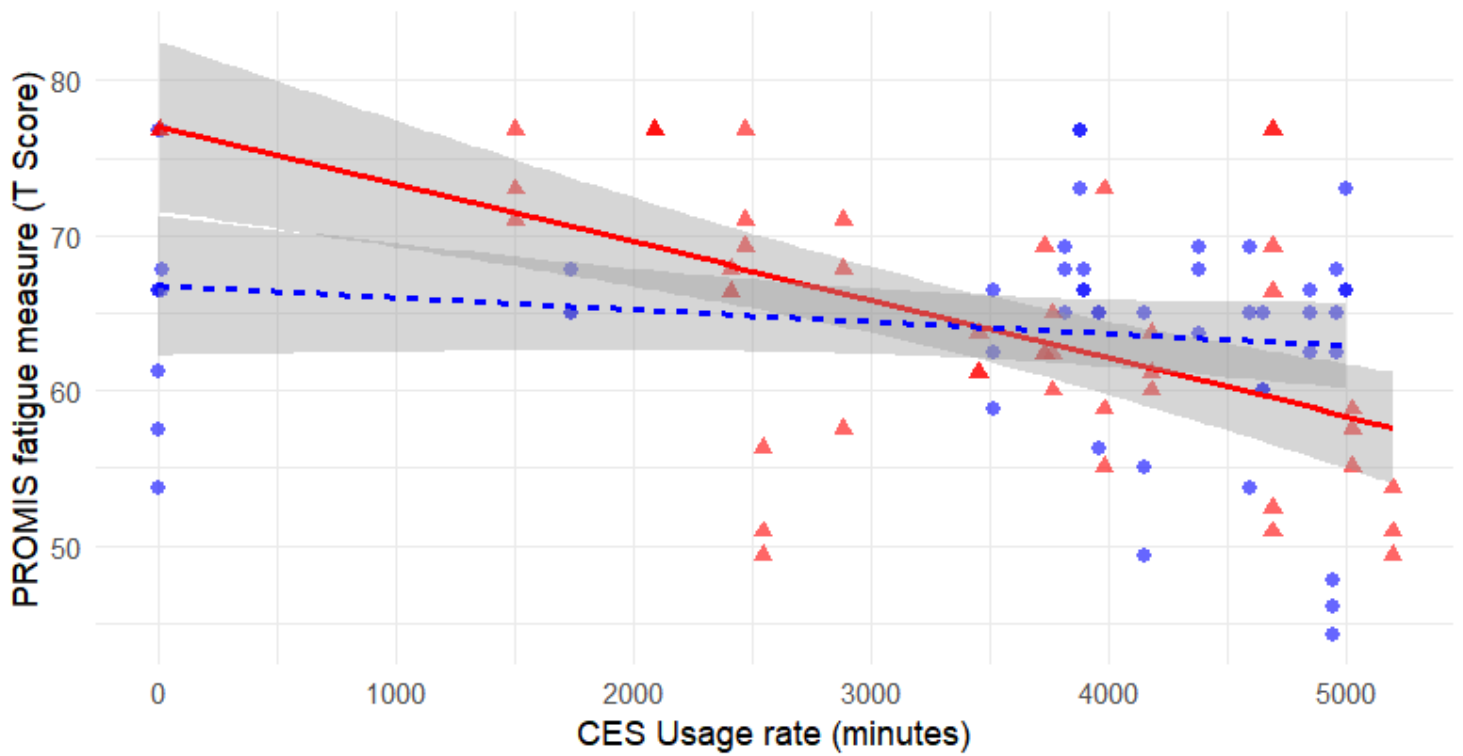
Disclosures



No

Tables / Images



Fatigue vs CES usage rate (TRUE vs SHAM)



Group  SHAM  TRUE

Fatigue 6a - Adult v1.0*Short Form Conversion Table*

Raw Score	T-score	SE*
6	33.4	4.9
7	39.1	2.9
8	42.0	2.4
9	44.2	2.2
10	46.1	2.1
11	47.8	2.1
12	49.4	2.1
13	50.9	2.0
14	52.4	2.0
15	53.7	2.0
16	55.1	2.0
17	56.3	1.9
18	57.5	1.9
19	58.8	1.9
20	60.0	1.9
21	61.2	1.9
22	62.4	1.9
23	63.7	2.0
24	65.0	2.0
25	66.4	2.0
26	67.8	2.0
27	69.3	2.0
28	71.0	2.1
29	73.0	2.5
30	76.8	3.8

*SE = Standard Error on T-score metric

Label in abstract	PROMIS code	Question
PROMIS1	HI7	“I feel fatigued” during the past 7 days (not at all=1; very much =5)
PROMIS2	AN3	“I have trouble starting things because I am tired” during the past 7 days (not at all=1; very much =5)
PROMIS3	FATEXP41	“How run-down did you feel on average?” in the past 7 days (not at all=1; very much =5)
PROMIS4	FATEXP40	“How fatigued were you on average?” in the past 7 days (not at all=1; very much =5)
PROMIS5	FATEXP35	“How much were you bothered by your fatigue on average?” in the past 7 days (not at all=1; very much =5)
PROMIS6	FATIMP49	“To what degree did your fatigue interfere with your physical functioning?” in the past 7 days? (not at all=1; very much =5)