

nishita sharma¹ and Jyotsna Punj¹

¹All India Institute of Medical Sciences New Delhi

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Title page

Unexpected anti-depressant effects seen with full body pulsed electromagnetic treatment when given for chronic back pain in a patient with co-existent severe treatment resistant depression: A case report

Abstract

Pulsed Electromagnetic Field (PEMF) treatment is a non-invasive modality that uses low-frequency electromagnetic waves to stimulate cells and tissues in the body. When given as full body treatment, it has shown positive results in chronic back pain. Transcranial usage of PEMF has previously been explored for management of treatment resistant depression (TRD).

We report a patient of TRD where full body PEMF was used for chronic back pain. At the end of three weeks treatment, patient showed significant improvement in his symptoms of chronic back pain and surprisingly also reported reduced symptoms of co-existent TRD.

Key clinical message: Full body PEMF maybe administered in patients of TRD with CBP for beneficial effects in both clinical conditions

Author contribution: NS executed the treatment, wrote the first draft

JP planned the treatment, edited for final draft

Keywords

Pulsed electromagnetic fields; severe depression; treatment resistant depression; TRD; pain; quality of life, PEMF.

Introduction

Treatment of depression is often complex and challenging. Upto one third of patients with severe major depressive disorder do not respond to four consecutively prescribed antidepressants which is labelled as Treatment resistant depression (TRD).^{1, 2} Treatment remains a challenge with various experimental modalities like cognitive behavioral therapy and transcranial pulsating electromagnetic fields therapy (T-PEMF), a form of Pulsed Electromagnetic Field (PEMF).^{3,4}

PEMF therapy is a novel, non-invasive treatment that uses low-frequency electromagnetic currents to stimulate cells and tissues in the body. This treatment is delivered via different types of equipment tailored for different regions and ailments of the body. T-PEMF, in which PEMF is delivered trans cranially is found effective in various neurological conditions including TRD with improvement in about 30% patients.³ PEMF delivered to local region of body or full body has shown promising results in chronic back pain (CBP).⁴

We discuss a patient of TRD with CBP where PEMF via QRS 101 full body gel mattress treatment was given for CBP, however improved symptoms of TRD were also unexpectedly reported.

Case History

A 42-year-old adult male patient, 168cm in height, 65kgs was referred from the department of Orthopaedics to the Pain Clinic Outpatient Department (OPD) for CBP secondary to Prolapsed intervertebral disc (PIVD) for 2 years. He was on non-steroidal anti-inflammatory drugs (NSAIDs) since last 3 months. He was also a diagnosed patient of TRD on multiple oral medications for 8 years but had stopped treatment for last 3 months owing to no relief in his symptoms.

On examination, pain NRS for CBP was 8. Patient was assessed by psychiatry department in detail where examination revealed Hamilton Depression Rating Scale (HDRS) or HAMD 17 scale score of 26 (severe depression), DSM-5 criteria for Major Depressive Disorder (MDD) (recurrent depressive episode), Mini-International Neuropsychiatric Interview (MINI) score of 3 (moderately severe depression), Beck's Depression Inventory (BDI) score was 44. He was non-responsive to one or more antidepressants, given for at the past 8 years in an adequate dose. However, he discontinued all antidepressants for the past 3 months. The authors communicated with him in vernacular. He displayed compliance and good understanding of the Hindi language (including writing). Written informed consent was taken from the patient for the present report.

Methods

Patient was apprehensive about invasive epidural steroids for his CBP; thus, PEMF was offered to him as an option to which he consented. In accordance to the ongoing randomized controlled trial of PEMF on CBP, a total of 15 sessions of 30 minutes duration for five times a week using a full body mattress applicator of PEMF via QRS 101 system (Quantum Resonance System) at intensity of 40 micro Tesla were given over the course of three weeks.

Conclusion and Results

After treatment sessions, patient reported pain NRS of 2-3 for his CBP. Surprisingly a significant improvement in his depressive symptoms was also communicated. On further evaluation by psychiatry physician, HDRS was reduced from 26 to 7; BDI from 44 to 10 with significant improvements in other depression assessment parameters. (Table 1) Patient also reported an improvement in his overall mood, sleep, appetite, not experience irritability with people around him, no low mood or suicidal symptoms and an increased interest in activities. Patient reported better energy and enthusiasm to work along with improved sleep and psychological effects. Follow-up assessments conducted at three- and six-months post-treatment showed sustained improvement in depression assessment. (Table 1)

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	Pre PEMF treatment	Post PEMF treatment aft
CBP Pain NRS	8	4 (50%)
Hamilton Depression Rating Scale (HDRS) / HAM-D -17	26	7 (73%)
Beck’s Depression Inventory (BDI)	44	10 (77%)
Inventory of Depressive Symptomatology Self-Report (IDS-SR)	52	18 (65%)
Beck Anxiety Index (BAI)	16	7 (56%)
Maudsley Staging Method (MSM)	8	3 (62%)
Mini-Mental Status Examination (MMSE)	28	30 (7%)
Mini International Neuropsychiatric Interview (MINI)	3	0 (50%)

Table 1. Quantitative parameters of Back Pain NRS and Treatment resistance depression (TRD) at different time intervals

Numeric Pain Rating Scale (NPRS, range 0-10); Hamilton Rating Scale for Depression (HDRS / HAM-D-17 , range 0-52); Beck’s Depression Inventory (BDI , range 0-63) ; Inventory of Depressive Symptomatology Self Report (IDS – SR , range 0-84); Beck Anxiety Inventory (BAI, range 0-63); Maudsley Staging Method (MSM , range 0-15); Mini-Mental Status Examination (MMSE , range 0-30); Mini International Neuropsychiatric Interview (MINI , range 0-6)