

Supplementary Material

Title:

Repetitive transcranial magnetic stimulation: Is it an effective treatment for cancer pain?

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Table S1. Research on rTMS for cancer pain management.

Name	First author	Year of publication	Research technique	Site of stimulation	Amplitude	Frequency (HZ)	Train (S)	Interval time (S)	Total number of pulses (times)	Total sessions (time)	Result
Pilot study of repetitive transcranial magnetic stimulation in patients with chemotherapy-induced peripheral neuropathy	Yuko Goto ⁹³	2020	Randomized controlled, Single-blind	Contralateral M1	90% and 100% (RMT)	5	10	50	500	4	D-VAS and SF-MPQ2 scores significantly decreased.
Assessing the effectiveness of high frequency repetitive transcranial magnetic stimulation for post-mastectomy pain in breast cancer patients: A randomized controlled trial	Monika Kataria ⁹⁵	2024	Randomized controlled, Double-blind	Contralateral M1	80% (RMT)	10	20	60	1200	15	VAS and SF-MPQ scores both significantly decreased, while FACT-B significantly increased. The physical well-being subscale, emotional well-being subscale, and functional well-being subscale showed marked improvement. There was also a significant reduction in the detection thresholds for cold and warmth, as well as in the tolerance thresholds for cold pain and heat pain.

Effect of Repetitive Transcranial Magnetic Stimulation on Malignant Visceral Pain	Eman M. Khedr ⁸⁹	2015	Randomized controlled, Single-blind	Contralateral M1	80% (RMT)	20	10	30	2000	10	VAS/VDS scores decreased, with the therapeutic effects lasting for at least 2 weeks but less than 1 month after the end of the treatment course.
Analgesic Effects of Repetitive Transcranial Magnetic Stimulation in Patients With Advanced Non-SmallCell Lung Cancer: A Randomized, Sham-Controlled, Pilot Study	Ying Tang ⁹¹	2022	Randomized controlled, Double-blind	Left DLPFC	80% (RMT)	10	15	3	1500	15	In the rTMS group, NRS scores were significantly lower than those in the sham stimulation group during the 2nd and 3rd weeks. Additionally, the rTMS group showed significant improvements in OME daily dose, physical and psychological scores, HAM-A, and HAM-D scores by the 3rd week.
Interest of repetitive transcranial magnetic stimulation of the motor cortex in the management of refractory cancer pain in palliative care: Two case reports	Julien Nizard ⁹²	2015	Case report	Right M1	80% (RMT)	10	20	50	2000	5	Pain, anxiety, and depression symptoms were alleviated, with significant improvements in consciousness and alertness levels. MQS scores significantly decreased.

Interest of repetitive transcranial magnetic stimulation of the motor cortex in the management of refractory cancer pain in palliative care: Two case reports	Julien Nizard ⁹²	2015	Case report	Right M1	80% (RMT)	10	20	50	2000	5	NRS, MQS, HAD, and depression scores significantly decreased, and medication usage was reduced.
Repetitive transcranial magnetic stimulation for chemotherapy-induced peripheral neuropathy in multiple myeloma: A pilot study	Zhenzhu ang Yan ⁹⁴	2023	prospective controlled	Bilateral alternating M1	80% (RMT)	10	15	3	1400	30	VAS scores significantly decreased, and EORTC QLQ-CIPN20 scores also significantly decreased.
Repetitive transcranial magnetic stimulation in neuropathic pain secondary to malignancy: A randomized clinical trial	Eman M. Khedr ⁹⁰	2014	Randomized controlled, Double-blind	Contralateral M1	80% (RMT)	20	10	30	2000	10	VDS, VAS, LANSS, and HAM-D scores significantly decreased. There was a significant positive correlation between the percentage reduction in VAS pain scores and the reduction in depression. The therapeutic effects lasted for at least 2 weeks but less than 1 month after the end of the treatment course.

DLPFC: dorsolateral prefrontal cortex. M1: primary motor cortex. RMT: resting motor threshold. D-VAS: dynamic visual analog scale. SF-MPQ2: short-form McGill pain questionnaire version 2. VAS: visual analog scale. SF-MPQ: short-form McGill pain questionnaire. OME: oral morphine equivalents. HAM-A: Hamilton Anxiety Rating Scale. HAM-D: Hamilton Depression Rating Scale. MQS: Medication Quantification Scale. NRS: numerical rating scale. LANSS: Leeds Assessment of Neuropathic Symptoms and Signs. FACT-B: Functional Assessment of Cancer Therapy-Breast. EORTC QLQ-CIPN20: European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-Chemotherapy-Induced Peripheral Neuropathy 20.