Repetitive Transcranial Magnetic Stimulation as a Promising Potential Therapeutic Modality for the Management of Cancer-related Pain: An Issue that Merits Further Research

Sir,

Worldwide, cancer is a leading burden of disease.[1] During the process of cancer treatment, a wide range of physical and psychological sequels can occur. Cancer-related pain is one of the most frequent, critical, and fearsome symptoms in these patients.[2,3] Globally, it is established that the majority of cancer patients experience moderate to severe pain during any phase of disease continuum, which can be caused directly by the disease or its treatment. Considering that cancer-related pain is often multidimensional, it can negatively affect many aspects of a patient's life and may have catastrophic consequences.[2,4] Despite considerable advances in the pharmacologic and nonpharmacologic treatments for cancer-related pain, its management is an ongoing challenge for healthcare providers and has only limited success.[5] Although the exact mechanism of cancer-related pain has not yet been fully elucidated, neuroplasticity has been proposed as a relatively new plausible mechanism.[6,7] There is growing evidence that many pain conditions, especially chronic pain, are associated with excitability and/or reorganization of the brain's motor cortex.[7] It has been suggested that these cortical structure and function alterations may be related to the occurrence of cancer-related pain. Therefore, it is believed that using modalities that direct the changes of motor cortex in these patients may reverse these changes and improve their clinical outcomes.[8]

As an alternative and noninvasive technique, transcranial magnetic stimulation (TMS) can safely stimulate the cortical neurons for attenuation of pain. It has been shown that repeated delivery of TMS pulses (rTMS) could enhance neuroplasticity for long-term therapeutic advantages; however, its therapeutic efficacy in chronic pain conditions is still controversial.[7,9] There are currently very few studies to evaluate the efficacy of rTMS in patients with cancer. To date, only one case study has been published recently by Nizard *et al*., who evaluate and confirm the efficacy of rTMS therapy in treating severe cancer pain in two cases with refractory to conventional treatment. In this study, receiving 20-min sessions of rTMS applied to the right motor cortex, for 5 consecutive days, was associated with marked improvement in the patients' pain, anxiety, and mood. Furthermore, no significant adverse effect was reported.[10] To the best of our knowledge, there is no other published study in this regard.

Despite a dearth of research available, it seems that rTMS is a relatively safe, innovative, and effective alternative treatment for cancer-related pain. However, further well-designed clinical trials to determine its potential safety and efficacy in cancer patients, as well as its optimal delivered pulses/session and better choice of target for the application of rTMS are warranted.

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Conflicts of interest

There are no conflicts of interest.

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