Efficiency of repetitive Transcranial Magnetic Stimulation (rTMS) in the treatment of chronic neuropathic pain

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ABSTRACT

Introduction: Introduced in the early 90's, repetitive transcranial magnetic stimulation (rTMS) is a non-invasive means of treating chronic neuropathic pain (NP) that appears partially effective, in conjunction with drug therapy. Recent studies demonstrate a 50% improvement in pain symptoms for a third of patients concurrently undergoing the reference drug treatment -anticonvulsants, tricyclics and antidepressants-.

Objective: Evaluate therapeutic effects of rTMS for treating chronic neuropathic pain, in the short (≤1mois) and long term (> 1 month).

Materials and Methods: Observational, retrospective, single-center study of a cohort of 149 patients with chronic NP, non-responsive to other therapies, who underwent rTMS treatment between January 2014 and December 2015. Each patient received induction treatment (one daily session for 5 days), followed by a quantitative evaluation of the efficacy of rTMS at the end of first week (W1) and first month (M1). They were classified as responders to induction therapy if they demonstrated an improvement of at least 30% in their NP, on a numerical scale. Maintenance therapy was then proposed (one session per month for 6 months, then one session every 3 months for 6 months). The stimulation was delivered at high frequency, by neuro-navigation, to the primary motor cortex contralateral to pain. Logistic regression analyses were performed to identify potential predictors of efficacy in the short and long term.

Results: The mean age of patients was 59 years (± 14), two-thirds were women, with NP lasting for 9 years on average (± 8), of peripheral origin in 85% of cases. 54% of patients were eligible for maintenance treatment after evaluation at W1 / M1: 38% were responders at W1, 46% at M1. 30% of non-responders at W1 were responders at M1 and therefore eligible for maintenance treatment. 45% of patients who underwent maintenance treatment demonstrated persistent improvement after 6 months and 31% of them stopped drug therapy. No predictors for short- or long-term response were identified.

Conclusion: Repetitive transcranial magnetic stimulation appears to offer, in 45% of cases, long-term efficacy in the treatment of chronic NP. This study reveals the interest of an evaluation after 1 month of rTMS, with non-responding patients at W1 later demonstrating an improvement. These encouraging results need to be further confirmed by a controlled, prospective and qualitative study of rTMS efficacy in the treatment of chronic neuropathic pain.