Effectiveness of a second deep TMS in depression: A brief report

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Abstract

Objectives: Deep transcranial magnetic stimulation (DTMS) is an emerging and promising treatment for major depression. In our study, we explored the effectiveness of a second antidepressant course of deep TMS in major depression. We enrolled eight patients who had previously responded well to DTMS but relapsed within 1 year in order to evaluate whether a second course of DTMS would still be effective.

Methods: Eight depressive patients who relapsed after a previous successful deep TMS course expressed their wish to be treated again. Upon their request, they were recruited and treated with 20 daily sessions of DTMS at 20 Hz using the Brainsway’s H1 coil. The Hamilton depression rating scale (HDRS), Hamilton anxiety rating scale (HARS) and the Beck depression inventory (BDI) were used weekly to evaluate the response to treatment.

Results: Similar to the results obtained in the first course of treatment, the second course of treatment (after relapse) induced significant reductions in HDRS, HARS and BDI scores, compared to the ratings measured prior to treatment. The magnitude of response in the second course was smaller relative to that obtained in the first course of treatment.

Conclusions: Our results suggest that depressive patients who previously responded well to deep TMS treatment are likely to respond again. However, the slight reduction in the magnitude of the response in the second treatment raises the question of whether tolerance or resistance to this treatment may eventually develop.

1. Introduction

The partial effectiveness of pharmacotherapy in the treatment of major depressive disorder (MDD) on the one hand, and the major side effects of ECT on the other hand, called for the development and study of novel brain stimulation techniques. These techniques are attempted to overcome treatment-resistant depression. Repetitive transcranial magnetic stimulation (rTMS) is a relatively new brain stimulation technique, and has already been proven effective in treatment for major depression (Kozel and George, 2002; Loo and Mitchell, 2005; O’Reardon et al., 2007; Jorge et al., 2008). Recently, to improve the magnitude and rate of the antidepressant effect of TMS, a novel coil allowing stimulation of deeper brain regions was developed. This coil is termed the H-coil. The effectiveness of deep TMS in the treatment of depression has been demonstrated in four published studies so far: a medium size study which enrolled sixty five patients (Levkovitz et al., 2009), a medium size study which enrolled fifty seven patients (Isserles et al., 2010), a case series of seven patients (Rosenberg et al., 2010), and with a lower response rate in a series of depressive patients treated previously with electroconvulsive treatment (Rosenberg et al., 2010). A comprehensive safety study performed in healthy volunteers showed the safety of H-coils used even in high frequencies and intensities (Levkovitz et al., 2007). One case of DTMS-induced seizure has been reported in a patient receiving high doses of several antidepressant drugs (Isserles et al., 2010) and two more cases of seizures occurred in ongoing DTMS studies (personal communication), in which patients were receiving psychiatric medications that increase the risk for seizures. Out of 135 MDD patients that have participated in DTMS studies for the treatment of MDD, 32 (25%) patients reported the following side effects: minor headaches (28 patients) (Levkovitz et al., 2009; Isserles et al., 2010), dizziness and nausea (one patient) (Rosenberg et al., 2010), numbness of the right temporal and right cervical zone (one patient) (Rosenberg et al., 2010), insomnia (one patient) (Rosenberg et al., 2010), and foul smell and bad taste (one patient) (Rosenberg et al., 2010). Overall, despite the fact that 1 of 4

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