

Comparing Efficacy of Right and Left Prefrontal Repetitive Transcranial Magnetic Stimulation in Major Depression

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Abstract

Transcranial magnetic stimulation (TMS), a non-invasive technique for stimulation of the brain, has recently been suggested to be effective for the treatment of major depression. We tried to assess the efficacy of both right and left repetitive TMS (rTMS) in patients with major depression. Thirty patients diagnosed as major depression according to DSM IV diagnostic criteria, were divided into three equal groups the first 2 groups received rTMS on right or left prefrontal sides, while the third group was maintained only on pharmacotherapy. TMS treatment was administered in 10 sessions every other day using high frequency stimulation. Severity of depression was assessed blindly before, during and after completion of the treatment protocol. Patients who received left prefrontal rTMS had a significantly greater improvement compared with those who received right prefrontal rTMS, and those who received pharmacotherapy only. Further studies will be necessary to assess the efficacy of rTMS on the long-term outcome of major depression and other psychiatric disorders.

Keyword:

Introduction

Transcranial magnetic stimulation (TMS) has been used, since its introduction in 1985, as a non-invasive and safe stimulation of the cerebral cortex (Barker et al., 1985). The development of stimulators capable of discharging at high frequencies (up to 60 Hz) has expanded the application of TMS into therapeutic fields (Pascual-Leone et al., 1995). Depending on stimulation parameters (frequency, rate and duration), repetitive stimuli to specific cortical regions can either decrease or enhance the excitability of the affected brain structures (Pascual-Leone et al., 1994). Repetitive stimulation of the prefrontal cortex in normal volunteers has been shown to have a lateralized effect on mood, with increased sadness following left prefrontal stimulation and increased happiness following right prefrontal stimulation (Martin et al., 1997). Based on imaging studies that link depression with lateralized prefrontal dysfunction and the observed effect in normal volunteers, TMS was tried in depressed patients (Pascual Leone et al., 1996). George et al. (1997) found that TMS administered to the left dorsolateral prefrontal cortex resulted in significant decrease in their depression rating scores. However, Feinsod et al. (1998) showed that right prefrontal rTMS produced marked improvement in patients with major depression

and modest improvement in schizophrenic patients.

Objectives

The present study was designed to compare the efficacy of right and left prefrontal rTMS administered at high frequency in patients with major depression.

Subjects and Methods

Thirty patients meeting DSM-IV criteria for major unipolar depression were included in this study. The whole procedure of TMS was explained and they gave written informed consent to participate. They were divided into 3 groups: the first group received rTMS on right prefrontal side, the second group received rTMS on left prefrontal side, while the third group was maintained on pharmacotherapy only. All groups were matched for age (range 20-45 years) and sex and didn't differ significantly on most clinical variables. Diagnosis was established by 2 senior psychiatrists and severity assessed using Hamilton Depression Rating Scale (HDRS). All patients were right handed based on their self report (for hemispherical lateralization). None had history of other psychiatric disorders, substance abuse, general medical or neurological problem and seizures, as well as