

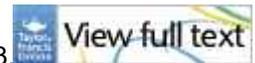
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Int J Psychiatry Clin Pract. 2015;19(4):252-8. doi: 10.3109/13651501.2015.1084329. Epub 2015 Sep 23.



## Repetitive transcranial magnetic stimulation in patients with drug-resistant major depression: A six-month clinical follow-up study.

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### Abstract

**OBJECTIVE:** In this study we aimed to assess the long-term efficacy of repetitive Transcranial Magnetic Stimulation (rTMS) on depressive symptoms and cognitive performance in patients with drug-resistant major depressive disorder (MDD).

**METHODS:** Fifteen drug-resistant depressed outpatients completed an acute trial with augmentative high-frequency rTMS over the left dorsolateral prefrontal cortex (DLPFC) and were compared with 15 drug-resistant MDD patients who underwent sham procedure. Depressive symptoms were evaluated with the Hamilton Depression Rating Scale and Montgomery-Asberg Depression Rating Scale. The Frontal Assessment Battery and the Stroop Color-Word Test Interference (Stroop T) were used to probe executive functions. Outcome measures were obtained at baseline, 4 weeks after the rTMS, as well as 3 months and 6 months after the end of the stimulation protocol.

**RESULTS:** After the active rTMS, patients showed a significant decrease in the scores at the depression rating scales that lasted for 6 months. A transient improvement was also observed at the Stroop T, although it did not persist in time.

**CONCLUSIONS:** High-frequency rTMS over the left DLPFC may have long-term antidepressant effect in drug-resistant MDD. TMS is a valuable tool for the add-on treatment of mood disorders and for the design of customized stimulation protocols.

**KEYWORDS:** Cortical excitability; drug-resistant major depression; neural plasticity; repetitive TMS

PMID: 26398527 DOI: [10.3109/13651501.2015.1084329](https://doi.org/10.3109/13651501.2015.1084329)

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*J Clin Psychiatry*. 2008 Mar;69(3):441-51.

## Transcranial magnetic stimulation in the acute treatment of major depressive disorder: clinical response in an open-label extension trial.

Avery DH<sup>1</sup>, Isenberg KE, Sampson SM, Janicak PG, Lisanby SH, Maixner DF, Loo C, Thase ME, Demitrack MA, George MS.

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### Abstract

**BACKGROUND:** This report describes the results of an open-label extension study of active transcranial magnetic stimulation (TMS) in medication-resistant patients with major depressive disorder who did not benefit from an initial course of therapy in a previously reported 6-week, randomized controlled study of active versus sham TMS.

**METHOD:** Patients with DSM-IV-defined major depressive disorder were actively enrolled in the study from February 2004 through September 2005 and treated with left prefrontal TMS administered 5 times per week at 10 pulses per second, at 120% of motor threshold, for a total of 3000 pulses/session. The primary outcome was the baseline to endpoint change score on the Montgomery-Asberg Depression Rating Scale (MADRS).

**RESULTS:** In those patients who received sham in the preceding randomized controlled trial (N = 85), the mean reduction in MADRS scores after 6 weeks of open-label active TMS was -17.0 (95% CI = -14.0 to -19.9). Further, at 6 weeks, 36 (42.4%) of these patients achieved response on the MADRS, and 17 patients (20.0%) remitted (MADRS score < 10). For those patients who received and did not respond to active TMS in the preceding randomized controlled trial (N = 73), the mean reduction in MADRS scores was -12.5 (95% CI = -9.7 to -15.4), and response and remission rates were 26.0% and 11.0%, respectively, after 6 weeks of additional open-label TMS treatment.

**CONCLUSIONS:** This open-label study provides further evidence that TMS is a safe and effective treatment of major depressive disorder. Furthermore, continued active TMS provided additional benefit to some patients who failed to respond to 4 weeks of treatment, suggesting that longer courses of treatment may confer additional therapeutic benefit.

**TRIAL REGISTRATION:** clinicaltrials.gov Identifier: [NCT00104611](https://clinicaltrials.gov/ct2/show/study/NCT00104611).

PMID: 18294022

[Indexed for MEDLINE]

