Clinical predictors associated with duration of repetitive transcranial magnetic stimulation treatment for remission in bipolar depression: a naturalistic study.

Cohen RB, Brunoni AR, Boggio PS, Fregni F.

Source
Centro Brasileiro de Estimulacao Magnetica Transcraniana, Sao Paulo, Brazil.

Abstract
Repetitive transcranial magnetic stimulation (rTMS) has been widely tested and shown to be effective for unipolar depression. Although it has also been investigated for bipolar depression (BD), there are only few rTMS studies with BD. Here, we investigated 56 patients with BD who received rTMS treatment until remission (defined as Hamilton Depression Rating Scores ≤7). We used simple and multiple logistic regressions to identify clinical and demographic predictors associated with duration of treatment (defined as <15 vs. >15 rTMS sessions). Age, refractoriness, number of prior depressive episodes, and severe depression at baseline were associated with a longer rTMS treatment. In the multivariate analysis, refractoriness (likelihood ratio (LR) = 4.33; p < 0.01) and baseline severity (LR = 0.18, p < 0.01) remained significant predictors. Our preliminary study showed that, in remitted patients, refractoriness and severity of index episode are associated with the need of a longer rTMS treatment; providing preliminary evidence of important factors associated with rTMS parameters adjustment.

PMID: 20823731
[PubMed - indexed for MEDLINE]
Risk factors for relapse after remission with repetitive transcranial magnetic stimulation for the treatment of depression.

Cohen RB, Boggio PS, Fregni F.

Source
Centro Brasileiro de Estimulacao Magnetica Transcraniana, Sao Paulo, Brazil.
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Abstract

BACKGROUND:

Several studies have shown that repetitive transcranial magnetic stimulation (rTMS) treatment is associated with a significant antidepressant effect that can last for several months.

METHODS:

To investigate the mean remission time and the predictors associated with its duration; we performed a large retrospective, naturalistic study with 204 patients who underwent treatment with rTMS. During the periods from 2000 to 2006, we identified and collected the data on 204 patients who underwent rTMS treatment for major depression and who remitted their depression (defined as Hamilton Depression Rating Scores less or equal to 7). Patients were followed up to 6 months after this therapy.

RESULTS:

Event-free remission with the end point defined as relapse (Hamilton Depression Rating Scores higher than 8) was 75.3% (73.7) at 2 months, 60.0% (74.5) at 3 months, 42.7% (74.8) at 4 months, and 22.6% (74.5) at 6 months. According to a multivariate analysis, only the age and number of sessions were independent predictors of outcome. Although depression severity and
use of tricyclics also showed a significant relationship with remission duration, the model including these variables was not adequate to explain our data.

CONCLUSIONS:

The results of this study suggest that young age and additional rTMS sessions are associated with a long duration of rTMS effects and therefore future trials investigating the effects of maintenance rTMS treatment need to explore further the implication of these factors for depression remission.

PMID: 19170101
[PubMed - indexed for MEDLINE]

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MeSH Terms

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LinkOut - more resources


Pre-treatment anterior cingulate activity as a predictor of antidepressant response to repetitive transcranial magnetic stimulation (rTMS).


Source

Department of Psychiatry, Psychosomatics and Psychotherapy, University of Regensburg, Germany. Berthold.Langguth@medbo.de
Abstract

OBJECTIVES:

Repetitive transcranial magnetic stimulation (rTMS) is a brain stimulation technique which has received increasing attention as an antidepressant treatment. However available studies are characterized by a substantial variability in response. We hypothesized that individual patients' characteristics might contribute to such heterogeneity. Therefore we investigated whether either alterations of regional cerebral blood flow (rCBF) or clinical characteristics may predict antidepressant response to rTMS.

DESIGN:

24 patients with major depression and stable medication received high frequency (10 Hz) rTMS over the left dorsolateral prefrontal cortex (DLPFC) for two weeks as add-on treatment. ECD-Single photon emission computed tomographay (SPECT) imaging was performed 1 to 2 days before rTMS.

SETTING:

Tertiary referral center

RESULTS:

After two weeks of rTMS a mean reduction of 30% of the initial Hamilton Depression Rating Score (HAMD) was observed. Using a multivariate regression model with simultaneous evaluation of the relative impact of a-priori chosen potential factors influencing treatment outcome, two variables, the pretreatment anterior cingulate rCBF and the former response to antidepressant agents proved significant. High pretreatment anterior cingulate activity and low treatment resistance to pharmacologic therapy were positive predictors for treatment response to rTMS.

CONCLUSIONS:

Pretreatment anterior cingulate activity seems to be a useful prognostic marker of rTMS treatment response, which is in line with other treatment strategies, like sleep deprivation, electroconvulsive therapy or antidepressant medication.

PMID: 17984932
[PubMed - indexed for MEDLINE]
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- Regional cerebral blood flow changes after low-frequency transcranial magnetic stimulation of the right dorsolateral prefrontal cortex in treatment-resistant depression. [Neuropsychobiology. 2008]
- Positive predictors for antidepressive response to prefrontal repetitive transcranial magnetic stimulation (rTMS). [J Psychiatr Res. 2007]
- SPECT mapping of cerebral activity changes induced by repetitive transcranial magnetic stimulation in depressed patients. A pilot study. [Psychiatry Res. 2001]
- Review Predictors of antidepressant response in clinical trials of transcranial magnetic stimulation. [Int J Neuropsychopharmacol. 2006]

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- Brain SPECT Imaging in Complex Psychiatric Cases: An Evidence-Based, Underutilized Tool. [Open Neuroimag J. 2011]
- Baseline brain metabolism in resistant depression and response to transcranial magnetic stimulation. [Neuropsychopharmacology. 2011]

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Related information
Regional cerebral blood flow changes after low-frequency transcranial magnetic stimulation of the right dorsolateral prefrontal cortex in treatment-resistant depression.

Kito S, Fujita K, Koga Y.
Abstract

Several studies have proved that low-frequency transcranial magnetic stimulation (TMS) of the right dorsolateral prefrontal cortex (DLPFC) showed an antidepressant effect, although its mechanism is still not completely elucidated. The aim of the present study was to clarify the alteration in neuroanatomical function elicited by low-frequency TMS of the right DLPFC in treatment-resistant depression and to detect the difference between responders and nonresponders to TMS. Single-photon emission computed tomography with (99m)Tc-ethyl cysteinate dimer was performed in 14 right-handed male patients with treatment-resistant unipolar depression before and after low-frequency TMS of the right DLPFC. Five 60-second 1-Hz trains were applied and 12 treatment sessions were administered within a 3-week period (total pulses, 3,600). The Hamilton Rating Scale for Depression was administered and the regional cerebral blood flow (rCBF) was analyzed using statistical parametric mapping (SPM2). After TMS treatment in 14 patients, the score on the Hamilton Rating Scale for Depression decreased significantly, and considerable decreases in rCBF were seen in the bilateral prefrontal, orbitofrontal, anterior insula, right subgenual cingulate, and left parietal cortex, but no significant increase in rCBF occurred. Additionally, as compared with 8 nonresponders, 6 responders showed significant increases in rCBF at baseline in the left hemisphere including the prefrontal and limbic-paralimbic regions. These results suggest that the antidepressant effect of low-frequency TMS of the right DLPFC is associated with a decrease in rCBF in the limbic-paralimbic regions via the ipsilateral subgenual cingulate, and increased rCBF at baseline in the left hemisphere may be involved in the response to low-frequency TMS treatment.

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PMID: 18781088
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Changes in regional cerebral blood flow following antidepressant treatment in late-life depression.

Ishizaki J, Yamamoto H, Takahashi T, Takeda M, Yano M, Mimura M.
OBJECTIVE:
Reversible/irreversible abnormalities of regional cerebral blood flow (rCBF) are seen in patients with depression. However, in late-life depression there is little evidence of a longitudinal change in rCBF through remission. We examined whether the decreased rCBF in individuals with late-life depression resolves following treatment.

METHODS:
Twenty-five depressed patients older than 55 years completed the Hamilton Rating Scale for Depression and single photon emission computed tomography before and after a mean of 13.7 weeks of pharmacotherapy. Quantitative analyses were performed using the Statistical Parametric Mapping procedure.

RESULTS:
Patients with depression demonstrated decreased rCBF in the anterior ventral and dorsal medial prefrontal cortex (PFC), including anterior cingulate cortices, bilateral ventrolateral PFC to temporal cortices, and bilateral medial to lateral parieto-occipital lobes relative to healthy controls. No particular areas showed increased rCBF. Following pharmacotherapy, rCBF significantly increased in the left dorsolateral PFC to precentral areas and the right parieto-occipital regions. However, decreased rCBF at baseline in the anterior ventral/dorsal medial PFC, bilateral ventrolateral PFC, bilateral temporal lobes, and bilateral parietal lobes did not show significant improvement after treatment.

CONCLUSIONS:
Remarkable improvements in rCBF in the left dorsolateral PFC to precentral regions are consistent with the hypothesis that neuronetworks including the left frontal cortex may be functionally and reversibly involved in late-life unipolar major depression (state-dependent). In contrast, neural circuits including bilateral medial, dorsolateral, and parietal areas may reflect underlying and continuous pathognomonic brain dysfunction of depression (trait-dependent).

PMID: 18214999
[PubMed - indexed for MEDLINE]
• Review Effects of medications on cerebral blood flow in late-life depression. [Curr Psychiatry Rep. 2002]
• Review [Regional cerebral blood flow in depression]. [Psychiatr Pol. 1999]

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Frontocingulate dysfunction in depression: toward biomarkers of treatment response.

Pizzagalli DA.

Source

Center for Depression, Anxiety, and Stress Research & Neuroimaging Center, McLean Hospital, Harvard Medical School, Belmont, MA 02478, USA. dap@mclean.harvard.edu

Abstract

Increased rostral anterior cingulate cortex (rACC) activity has emerged as a promising predictor of treatment response in depression, but neither the reliability of this relationship nor the mechanisms supporting it have been thoroughly investigated. This review takes a three-pronged approach to these issues. First, I present a meta-analysis demonstrating that the relationship between resting rACC activity and treatment response is robust. Second, I propose that the rACC plays a key role in treatment outcome because of its 'hub' position in the default network. Specifically, I hypothesize that elevated resting rACC activity confers better treatment outcomes by fostering adaptive self-referential processing and by helping to recalibrate relationships between the default network and a 'task-positive network' that comprises dorsolateral prefrontal and dorsal cingulate regions implicated in cognitive control. Third, I support this hypothesis by reviewing neuropsychological, electrophysiological, and neuroimaging data on frontocingulate dysfunction in depression. The review ends with a discussion of the limitations of current work and future directions.

PMID: 20861828
[PubMed - indexed for MEDLINE]
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Durability of clinical benefit with transcranial magnetic stimulation (TMS) in the treatment of pharmacoresistant major depression: assessment of relapse during a 6-month, multisite, open-label study.


Source

Department of Psychiatry, Rush University Medical Center, Chicago, Illinois 60612, USA. pjanicak@rush.edu

Abstract

BACKGROUND:

Although transcranial magnetic stimulation (TMS) can be an effective acute antidepressant treatment, few studies systematically examine persistence of benefit.

OBJECTIVE:

We assessed the durability of antidepressant effect after acute response to TMS in patients with major depressive disorder (MDD) using protocol-specified maintenance antidepressant monotherapy.

METHODS:

Three hundred one patients were randomly assigned to active or sham TMS in a 6-week, controlled trial. Nonresponders could enroll in a second, 6-week, open-label study. Patients who met criteria for partial response (i.e., > 25% decrease from the baseline HAMD 17) during either the sham-controlled or open-label study (n = 142) were tapered off TMS over 3 weeks, while simultaneously starting maintenance antidepressant monotherapy. Patients were then followed for 24 weeks in a naturalistic follow-up study examining the long-term durability of TMS. During this durability study, TMS was readministered if patients met prespecified criteria for symptom
worsening (i.e., a change of at least one point on the CGI-S scale for 2 consecutive weeks). Relapse was the primary outcome measure.

RESULTS:

Ten of 99 (10%; Kaplan-Meier survival estimate = 12.9%) patients relapsed. Thirty-eight (38.4%) patients met criteria for symptom worsening and 32/38 (84.2%) re-achieved symptomatic benefit with adjunctive TMS. Safety and tolerability were similar to acute TMS monotherapy.

CONCLUSIONS:

These initial data suggest that the therapeutic effects of TMS are durable and that TMS may be successfully used as an intermittent rescue strategy to preclude impending relapse.

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PMID: 20965447
[PubMed - indexed for MEDLINE]

Dear NeuroStar TMS Therapy Providers:

The Medical College of Georgia at Georgia Health Sciences University recently published findings in Psychiatry Research which show that while NeuroStar Transcranial Magnetic Stimulation (TMS) alleviates the symptoms of depression, it does not cause negative effects such as insomnia or excessive sleepiness.

The findings were the result of a secondary analysis of the Neuronetics sponsored randomized controlled trial which studied 301 patients across 23 sites comparing active NeuroStar TMS Therapy to sham treatment.

The analysis shows that while patient's sleep improves as their depression decreases, patients did not experience insomnia or sleepiness during actual NeuroStar treatment - a common side effect associated with antidepressant medication.

Click here to view the full press release from the Medical College of Georgia.

Sincerely,

Mark Demitrack, MD
Chief Medical Officer, Neuronetics, Inc.
1-877-600-7555

NeuroStar TMS Therapy is indicated for the treatment of Major Depressive Disorder in adult patients who have failed to achieve satisfactory improvement from one prior antidepressant medication at or above the minimal effective dose and duration in the current episode.

The most common adverse event related to TMS is localized pain or discomfort at or near the treatment area during active TMS.