

ABSTRACT

Background: Cognitive impairment is persistently observed in patients suffering from major depressive disorder. It persists even after depressive symptoms resolution or improvement. rTMS is a safe and effective treatment for treatment-refractory depression. It appears to be able to modulate circuits involving cognitive process in depressed patients, while results on its cognitive effects have been mixed.

Objective: The aim of the study is to investigate the effect of a daily 20-session course of rTMS targeting left dorsolateral prefrontal cortex on cognitive function domains in patients with treatment refractory depression; and to examine the relationship between the changes in depressive symptom severity and changes in cognitive function.

Methods: Participants in a current major depressive episode who have failed at least one full course of antidepressant for 6 weeks were recruited from the specialist outpatient clinics in New Territories East Cluster under the Hospital Authority of Hong Kong. All of them received rTMS treatment 5 days per week for 4 weeks (20 sessions in total). Changes in cognitive outcome measurements were assessed using standardized cognitive paradigms from the CANTAB that tapped into executive, memory and attentional functions (including OTS, SWM, DMS, PAL, RVP) at baseline, week 2, week 4 and week 8. Their depressive symptoms improvement were measured by BDI-II, MADRS and CGI.

Results: 22 subjects were recruited into the study. 1 subject dropped out at the end of week 4 and switched to private service track and received extension phase of daily rTMS. Around 55% patients responded significantly to rTMS treatment as defined by 50% or more reduction on MADRS score from baseline after completion of rTMS daily sessions for four weeks. 1 subject had her cognitive assessments score excluded because of significant somatic symptoms during assessment which affected her performance. As a whole, there was statistically significant improvement in the domain of RVP (sensitivity). There was no between-group difference observed in the cognitive function trajectory between clinical responders and non-responders to rTMS.

Conclusion: There was no evidence on generalized cognitive improvement after a 4-week daily course of rTMS. Antidepressant effect of rTMS does not have a definite association with quantifiable improvement in executive function, attention, and memory measured with standardized neuropsychological battery.