

Efficacy of prefrontal rTMS on the refractory depressed patients: a real world experience

Tung-Ping Su^{1,2,3,4}, Yuan Wei¹, Wei-Chung Mao¹, Ya-Ping Liu¹, Li-Chi Chen¹, Yee Lam E Chan¹, Feng-Chang Yen¹

¹Department of Psychiatry, Cheng-Hsin General Hospital, Taipei, Taiwan

²Branch of Psychiatry, Faculty of Medicine, National Yang Ming Chia Tong University, Taipei, Taiwan

³Brain Science Institute, National Yang Ming Chiao Tong University, Taipei, Taiwan

⁴Department of Psychiatry, Taipei Veterans General Hospital, Taipei, Taiwan

Background

Repetitive transcranial magnetic stimulation (rTMS) has been developed as a novel tool for improving depression by delivering magnetic stimulation to the brain. rTMS has been approved to use for depression by Taiwan FDA since 2018. Over the past two years, we treated the patients with refractory depression (TRD) to investigate its clinical efficacy, response and remission rate and to search for the outcome predictors from clinical variables.

Methods

Using the Magstim machine as a stimulation tool, we applied it onto left prefrontal area of the brain in TRD patients, who included female 133 and male 69, aged 46.6 (+18.0) year; major depression 161 subjects (79.7%) and bipolar depression 41 subjects (20.3%). Their age-onset was 35.9 (+18.1) years and duration of illness was 11.1 (+10.4) years. Among them, 59.4% (n=120) and 40.6% (n=82) received standard TMS and theta burst stimulation (TBS) respectively. MADRS mood scale rating was assessed at D0, D5, D10, D15, and D20. One-way ANOVA with repeated measures as well as pair t-test comparisons was performed for statistical analysis.

Results

All 202 subjects had completed one treatment course (10 times of stimulation), while 71 subjects of them received 2 treatment courses (20 times of stimulation). Primary outcome revealed a significant reduction of MADRS score from D0 (28.6+7.8), D5 (17.3+9.2) to D10 (13.9+9.7) with all significant mutual paired comparisons (all $p < 0.01$). For the 2-course treatment group (n=71), similar results were observed with reduction of MADRS score from D0 (27.6+8.1) to D5 (17.2+8.9), D10 (13.6+9.6), D15 (9.8+6.3) to D20 (10.3+1.0) with all significant mutual paired t-test (all $p < 0.05$), indicating that continuation stimulation for another 10 times may be more beneficial. Response rate (decreased MADRS score $\geq 50\%$ from D0) was found 54.5% (n=110) on D10, while remission rate (MADRS ≤ 11) was 47% (n=95). On D20 (n=71), response rate was 73.3% (n=52) while remission rate was 66.2% (n=47). There were no differences between age (< 50 vs. ≥ 50) age onset (< 50 vs. ≥ 50), duration of illness (< 5 years vs. ≥ 5 years), gender, standard TMS and TBS, and diagnosis (MDD vs. BD). Furthermore, using MINI diagnostic tool, patients comorbid with generalized anxiety disorder (GAD), moderate suicidality and chronic dysthymia had significantly lower response rates than those without in one-course treatment.

Discussion & Conclusion

Either standard TMS or TBS showed equal efficacy on TRD patients with responder rate around 54% and remission rate of 47%. Treatment with a 2-course of rTMS is better than with one-course in the improvement of refractory depression. These patients with comorbid GAD, suicidal severity and chronic dysthymia may not be beneficial to TMS as greater as those without.