Comparison of Right vs Left Accelerated Resting-State fMRI-Guided Theta Burst Stimulation to the DLPFC for Late-Life Depression: A Pilot Study

Jude Chavez, Karen Luo, Crystal Garcia, Christopher Abbott, Davin Quinn

Background: While trials of accelerated, neuronavigated repetitive transcranial magnetic stimulation (rTMS) to the left dorsolateral prefrontal cortex (DLPFC) for depression have shown efficacy for depression, there has not yet been validation of this technique for late-life depression (LLD). Additionally, no studies have tested accelerated intermittent theta burst stimulation (iTBS) to the right DLPFC for depression, although it may benefit depression and anxiety.

Methods: We enrolled 36 elderly patients (ages 50-79 years) with a diagnosis of pharmacoresistant depression of at least 6 months. Each participant received 45 sessions (5 treatments/day over 9 days) of iTBS to their functional MRI (fMRI) determined target. Additionally, each patient underwent fMRI and behavioral assessment pretreatment and after 15th and 45th treatments. The Inventory of Depressive Symptoms (IDS-30-C) measured changes in depressive symptoms and the Generalized Anxiety Disorder-7 (GAD-7) measured changes in anxiety symptoms. IDS-30-C was elicited at one and three months after treatment.

Results: Mean age was 65 ± 6.9 years (36 patients). Mean IDS-30-C and GAD-7 scores decreased throughout study protocol: IDS-30-C – V1: 38.97 ± 9.6; V2: 31 ± 9.3; V3: 20.4 ± 10.2; GAD-7 – V1: 10.4 ± 5.4; V2: 8.9 ± 4.8; V3: 5.6 ± 5.1. There was a 18.6 point decrease in mean IDS-30-C scores from Visit 1 to Visit 3. Of 18 patients (mean age 63 ± 7.4 years), depression scores remained below pretreatment values at one and three months (20.34 ± 14.15). Updated right-vs-left stimulation data will be reported on conference day.

Conclusions: Preliminary results showed accelerated fMRI-guided iTBS to the right DLPFC in patients with LLD was effective in reducing symptoms of depression and generalized anxiety. Updated right-versus-left sided stimulation conclusions will be reported on conference day.

Non-expert summary

We tested a new treatment for late-life depression using a type of non-invasive brain stimulation called repetitive transcranial magnetic stimulation (rTMS) to the left and right dorsolateral prefrontal cortex. Thirty-six patients aged between 50 and 79 years, with pharmacoresistant depression for at least 6 months, were given 45 sessions of the treatment. The results indicate that the iTBS treatment may significantly reduce symptoms of depression and generalized anxiety in patients with late-life depression.