

and adolescents with dyslexia with age range 9–15 years underwent speech in noise perception test, auditory verbal memory test and LLAEP assessment in a baseline condition without tDCS, sham (placebo) and after 20 min of exposure with 1 mA current to two different tDCS statuses: anode electrode of tDCS on left STG / reference electrode on right shoulder and anode electrode on the left STG / reference electrode on right STG to enhance left lateralization (offline). Our results showed improved speech in noise perception and memory and reduced latency and increased amplitude of the waves P1, N1 and P2 with both electrodes arrangement (P). **Keywords:** transcranial direct current stimulation, dyslexia, central auditory processing

### 730

#### MODULATING CUE-REACTIVITY WITH CONTINUOUS THETA BURST STIMULATION TO THE FRONTAL POLE: A NOVEL TARGET WITH TRANSDIAGNOSTIC RELEVANCE

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**Background:** Cue-reactivity is one of the most powerful predictors of relapse among multiple addiction phenotypes. In these populations, cues lead to consistent neural activity in multiple nodes of the salience network including the anterior cingulate cortex (ACC), insula and ventral medial prefrontal cortex (vmPFC). We have now performed a series of sham-controlled, multiday clinical trials which have evaluated the efficacy of continuous theta burst stimulation as a tool to dampen cue reactivity in multiple populations.

**Method:** 76 treatment seeking individuals (cocaine, alcohol, nicotine users, compulsive eaters) participated in 1 of 4 clinical trials wherein they received a functional MRI assessment of cue-reactivity (tailored to their drug of choice) before and after a 5 or 10 day course of real or sham continuous theta burst stimulation (120% RMT, 3600 pulses; 132 fMRI scans total). Brain reactivity to cues was quantified in a priori defined nodes of the salience and executive control networks. Multiple regression was used to assess the impact of time, treatment, and addiction-phenotype on cTBS related changes in cue-reactivity.

**Results:** There was a significant interaction between treatment and time in the dorsolateral prefrontal cortex ( $F(1,142)=7.38; p=0.007$ ), vmPFC ( $F(1,142)=6.43; p=0.012$ ), insula ( $F(1,142)=6.97; p=0.009$ ), and ACC ( $F(1,142)=5.42; p=0.023$ ). There was no significant effect of addiction-phenotype on modulation of these regions other than the ACC ( $F=5.24; p=0.023$ ) wherein the effect was largest in the alcohol users. There was also no significant interaction with the Occipital cortex response to cues (control region).

**Discussion:** These data demonstrate, for the first time, that a multiday course of real versus sham cTBS to the left frontal pole has a significant effect cue-reactivity in multiple classes of patients. The feasibility and efficacy this approach opens a de novo therapeutic possibility for changing cue reactivity with TBS.

**Keywords:** addiction, neuroimaging, theta burst stimulation, TBS

### 731

#### CLINICAL EFFECTIVENESS OF 5HZ TRANSCRANIAL MAGNETIC STIMULATION APPLIED ON LEFT DORSOLATERAL PREFRONTAL CORTEX AND DORSOMEDIAL PREFRONTAL CORTEX ON CLINICAL DEPRESSED PATIENTS

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**Objective:** 26 out of 50 participants (age: 18–45) diagnosed with MDD (DSM-5 criteria) were accepted via informant consent; 18 women (age:

29.31±7.43) and 8 men (33.6±5.81) and were evaluated by Hamilton Depression Rating Scale (HDRS), Montgomery-Asberg Depression Rating Scale (MADRS), Beck Depression Inventory (BDI) and Hamilton Anxiety Rating Scale (HARS). Patients were divided in two groups (Group 1: LDPFC and Group 2: DMPFC), each group received 5Hz rTMS for 3 weeks.

**Results:** Student's t and Wilcoxon Rank Test ( $p<0.0005$ ), on Both groups showed reduction in their depressive symptomatology, according to the scales (Pre/Post treatment with rTMS). For Group 1 (LDPFC, 13 participants): HDRS (Pre Treatment: 31.6±5.18. Post Treatment: 9.79±8.87), MADRS (Pre Treatment: 35.26±5.18. Post Treatment: 9±9.21), BDI (Pre Treatment: 41.2± 14.56 Post Treatment: 15.73±16.74), HARS (Pre Treatment: 28.86±8.1 Post Treatment: 12.93±9.65). For Group 2 (DMPFC, 13 Participants): HDRS (Pre Treatment: 31.57±6.15. Post Treatment: 11.5±9.10), MADRS (Pre Treatment: 35.07±6.25. Post Treatment: 8.92±8.04), BDI (Pre Treatment: 49.92± 15.14 Post Treatment: 15.73±16.74), HARS (Pre Treatment: 32.14±7.94 Post Treatment: 11.14±9.56). Cohen's d was applied to measure size effect on the most statistically significant symptoms reduction, where Group 1 showed statistically larger size effect on physical symptoms, anhedonia and suicidal thoughts.

**Conclusions:** Results suggest efficacy in both groups, however Group 1 showed larger size effect than group 2. We advice to carry out more studies with a larger sample to obtain more statistically significant results and also carry out more studies on the effect of 5 Hz rTMS over DMPFC.

**Keywords:** Transcranial Magnetic Stimulation Depression Psychology Psychiatry

### 732

#### CASE REPORT: IMPROVED RTMS EFFICACY AFTER FMRI LOCALIZES DLPFC TARGET TO NON-DOMINANT HEMISPHERE

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**Introduction:** Repetitive transcranial magnetic stimulation (rTMS) to the left DLPFC is used to treat major depressive disorder (MDD). Current approximation of DLPFC location is done using a standardized rTMS position 5.5cm anterior to the left primary motor cortex, and generally results in modest remission rates in the literature. However, this approach may fail to account for variability in individualized localization of function. This case report demonstrates the potential efficacy of using a stimulated fMRI scan to determine the precise position of TMS targets in an attempt to improve treatment outcomes.

**Case description:** The patient is a 43 year-old right-handed female with a history of MDD, dysthymia and rumination, who presented with one year of worsening depressive symptoms despite a robust course of psychotherapy and numerous medications. Following 7 sessions of traditional rTMS targeting the left DLPFC localized via the standardized 5.5cm rule, the patient reported feeling more depressive symptoms.

**Methods:** To acquire the precise location of her DLPFC target, the patient underwent a task-based fMRI to elicit DLPFC activity. Despite being right-handed, the DLPFC activation localized to her right hemisphere. Also, the DLPFC activation localized approximately 1.5cm anterior to where the 5.5cm rule would have predicted. During an fMRI cognitive reappraisal task, the patient's right VLPFC showed activation with robust consistency, suggesting its role in partially mediating reappraisal. The patient then underwent a course of fMRI-guided rTMS using these individualized right hemisphere targets. The Beck Depression Inventory (BDI) was used to measure mood symptoms at the start of each week of treatment.

**Results:** During and after the course of 20 sessions, the patient reported a significantly increased mood, mental clarity, cognitive control of reactivity to stressors, and a decrease in ruminative thoughts. Her BDI score decreased considerably and at a two month follow-up, the patient reported continued significant improvement.

**Keywords:** TMS, fMRI, Neuronavigation, Depression