A preliminary exploration of the effect of concurrent antidepressant medication on responses to high-frequency repetitive transcranial magnetic stimulation (rTMS) in severe, enduring anorexia nervosa

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Supplementary file

S1: rTMS target and parameters

Target: The left dorsolateral prefrontal cortex (DLPFC) was selected as the target brain area in this trial for several reasons: (a) the DLPFC is involved in a number of cognitive processes that have been implicated in anorexia nervosa (AN) e.g., emotion regulation, self-control (described in: [1, 2]); (b) high-frequency rTMS to the left DLPFC has shown efficacy and acceptability in the treatment of related psychiatric disorders, including depression [3]; and (c) for practical accessibility reasons.

In order to localise the DLPFC (Talairach co-ordinates x = −45 y =45 z = 30) [4, 5] for neuronavigation (using Brainsight™ neuronavigation software) purposes, all participants underwent a structural MRI scan prior to starting rTMS treatment.

Parameters: To determine the intensity of the rTMS stimulation, a Magstim Rapid device (Magstim®, Whitland, Wales, UK) with a real TMS figure-of-eight coil was used to determine participants' motor threshold (MT). This represents membrane-related excitability of cortical axons. Using the motor-evoked potential method, the MT was established by determining the minimum stimulator output intensity required to obtain five out of ten motor-evoked potentials >50 μV. MT was acquired weekly for each participant to ensure accuracy of the rTMS dose.

The Magstim Rapid device and Magstim D70-mm air-cooled real and sham coils were used to administer real and sham rTMS. Participants in the real group received 20 sessions of high-frequency (10 Hz) rTMS at 110 % of their individual MT, consisting of twenty 5-second trains with 55-second inter-train intervals delivered to the left DLPFC (a total of 1000 pulses delivered over each 20 minute session) [4, 5]. Sham stimulation was administered at the same parameters as real rTMS using a sham coil. The sham coil produces the same noises and feelings as the real coil but does not deliver active stimulation to the brain; rather it stimulates facial and scalp nerves.

S2: Medication and concurrent treatment

Table 1. Psychotropic medication and psychological treatment received concurrently to real rTMS treatment. Each row represents an individual participant. Psychotropic medications remained at a stable dose throughout rTMS treatment.

Antidepressant medication	Other psychotropic medication	Concurrent ED treatment
No antidepressant group		
-	Diazepam Nitrazepam	-
-	-	-
-	-	Outpatient
-	-	Outpatient
-	-	Outpatient
-	-	Outpatient
-	-	-
-	-	Outpatient
-	-	Outpatient
-	-	Outpatient
Antidepressant group		
Sertraline Bupropion	-	Outpatient
Sertraline	-	Day patient
Fluoxetine	-	Outpatient
Sertraline	-	Outpatient
Fluvoxamine	Aripiprazole Diazepam	-
Sertraline	-	Outpatient
Sertraline	-	-
Phenelzine	-	Outpatient
Fluoxetine	-	Outpatient
Mirtazapine	Pregabalin	-
Duloxetine	Diazepam	-
Duloxetine	Quetiapine	Outpatient
Sertraline	-	Outpatient
Bupropion Fluoxetine	Zolpidem	-
Sertraline	-	Outpatient
Sertraline	-	-

Abbreviations: ED = eating disorder.

S3. Clinical characteristics at post-treatment and follow-up

Table 2. Means and standard deviations of clinical outcome measures at post-treatment and follow-up for the antidepressant and no antidepressant groups.

Measure	Antidepressants (n=16)		No antidepressants (n=10)	
	Post-treatment	Follow-up	Post-treatment	Follow-up
BMI (kg/m^2) (mean ± SD)	16.39 ± 1.84	16.53 ± 2.24*	16.11 ± 1.78	16.01 ± 2.28
EDE-Q Global (mean ± SD)	3.97 ± 1.14	3.52 ± 1.24*	3.54 ± 1.52	3.61 ± 1.65
EDE-Q Restraint (mean ± SD)	4.03 ± 1.61	3.63 ± 1.46*	3.56 ± 1.72	3.60 ± 1.72
EDE-Q Eating Concern (mean ± SD)	3.26 ± 1.09	3.11 ± 1.25*	3.16 ± 1.58	3.34 ± 1.91
EDE-Q Shape Concern (mean ± SD)	4.38 ± 1.26	3.81 ± 1.57*	3.98 ± 1.45	3.99 ± 1.57
EDE-Q Weight Concern (mean ± SD)	4.20 ± 1.35	3.55 ± 1.48*	3.48 ± 1.66	3.50 ± 1.74
DASS-21 Total (mean ± SD)	65.00 ± 26.56	57.20 ± 31.35*	46.4 ± 36.07	48.20 ± 35.70
DASS-21 Depression (mean ± SD)	27.88 ± 9.67	21.73 ± 12.98*	17.20 ± 13.24	17.80 ± 12.45
DASS-21 Anxiety (mean ± SD)	13.75 ± 13.89	12.40 ± 11.29*	8.40 ± 11.19	9.60 ± 11.99

*n=1 missing. Abbreviations: SD, standard deviation; BMI, body mass index; EDE-Q, Eating Disorder Examination – Questionnaire; DASS-21, Depression Anxiety and Stress Scales – Version 21

References in Supplementary File

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