

Transcranial Magnetic Stimulation and Treatment of Major Depressive Disorder with Comorbid Anxiety

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Outline

- ▶ Background
- ▶ Methods
- ▶ Experimental Results
- ▶ Conclusion
- ▶ Future Directions

Major Depressive Disorder (MDD)

- ▶ Characterized by at least one major depressive episode
- ▶ Symptoms include
 - ▶ Anhedonia
 - ▶ Persistent depressed mood
 - ▶ Thoughts of death/suicidal attempts
 - ▶ Disturbances in sleep
 - ▶ Substantial weight gain/loss

Anxiety Disorders

- ▶ Generalized Anxiety Disorder (GAD)
 - ▶ Persistent worry about different things
 - ▶ Fatigue
 - ▶ Muscle tension
 - ▶ Sleep issues
- ▶ Social Anxiety Disorder (SAD)
 - ▶ Anxiety due to social situations
 - ▶ Worry about being exposed to situations that may result in embarrassment

Transcranial Magnetic Stimulation (TMS)

- ▶ Non-invasive procedure that uses magnetic pulses to stimulate neurons in the brain
- ▶ FDA approved for treatment of Major Depressive Disorder
- ▶ 75% of patients responded to TMS, 50% achieved remission (Levkovitz et al 2015)
- ▶ Shows promise for patients with GAD and SAD (Diefenbach et al 2016)
- ▶ Two patients with SAD responded significantly to TMS (Paes et al 2011)

Purpose

- ▶ The purpose of the study was to study the effect of high frequency TMS treatment on patients with comorbid depression and at least one diagnosed anxiety disorder.

Methods

- ▶ All participants were patients at Big Sky Psychiatry who consented to all us to use their data anonymously.
- ▶ 17 patients underwent 9 weeks of treatment with 36 treatments in total.
- ▶ Treatment was ran at a high frequency with the locus being in the left dorsal lateral prefrontal cortex.

Scores

- ▶ Beck's Depression Inventory 2 (BDI)
 - ▶ Self-reporting questionnaire with questions on depressive symptoms.
 - ▶ 21 items, scale of 0-3
- ▶ Generalized Anxiety Disorder 7 (GAD)
 - ▶ Self-reporting questionnaire with questions on anxiety symptoms.
 - ▶ 7 items, scale of 0-3

	MDD	MDD+GAD	MDD+GAD+SAD
Age			
18-29	0	1	3
30-49	4	5	1
50-69	2	0	1
Avg. Age	48	41	34
Gender			
Male	2	3	3
Female	4	3	2

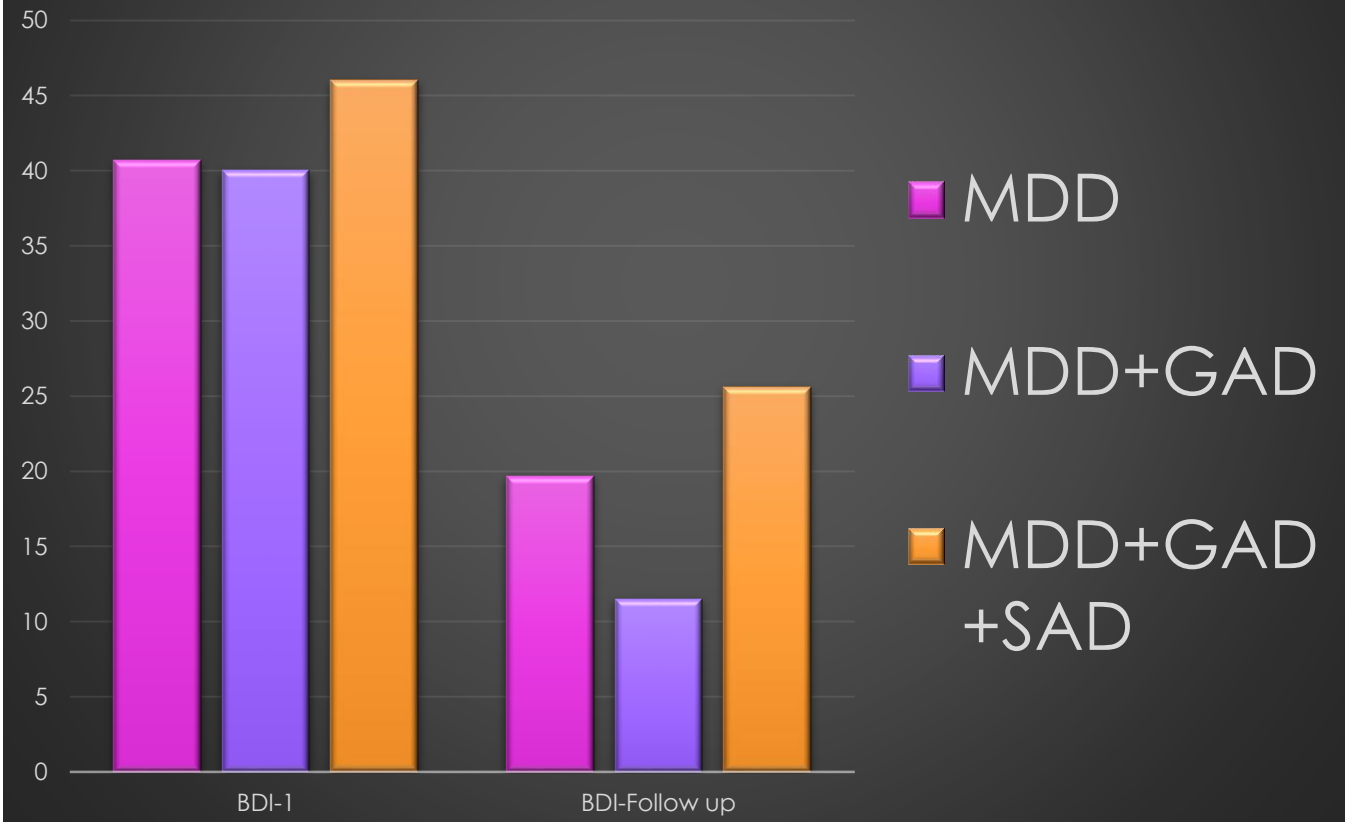
Demographics

Results

- ▶ BDI 1st week scores > 11 week scores
 - ▶ $f(1,17)=102.103, p>0.05$
- ▶ Difference between groups (MDD only, MDD+GAD, MDD+GAD+SAD)
 - ▶ No significant differences
- ▶ GAD 1st week scores > 11 weeks scores
 - ▶ $f(1,17)=56.741$
- ▶ A marginal difference of group was found across time
 - ▶ $f((1,17)2.449)$
 - ▶ MDD+GAD<MDD+GAD+SAD, significant difference at 11 weeks
 - ▶ $t(12)=2.468,$
 - ▶ MDD+SAD+GAD and MDD only, no significant difference at 11 weeks
 - ▶ $t(11)=-1.719$
 - ▶ MDD+GAD and MDD only, no significant difference at 11 weeks
 - ▶ $T(11)=0.466$

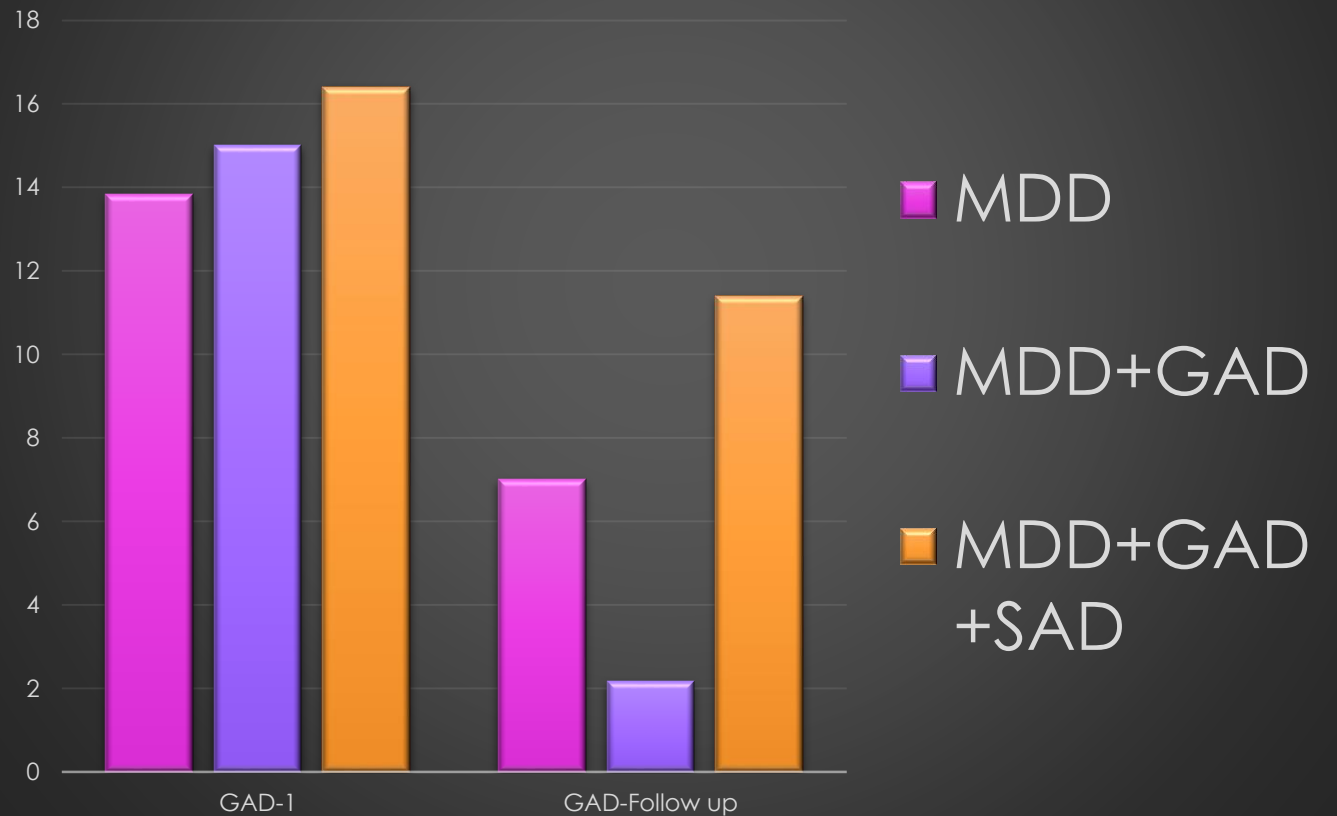
Results

Beck Depression Inventory-II



Results

Generalized Anxiety Disorder-7



Conclusions

- ▶ All patients in both depression and anxiety symptoms over the 11 week treatment.
- ▶ Results indicate patients with MDD+GAD may have a higher response rate than patients with MDD+GAD+SAD in anxiety related symptoms.
- ▶ Regardless of anxiety diagnosis, all patients improved in their depressive symptoms.
- ▶ Limitations include small number of participants and sensitivity and specificity of the GAD-7.
 - ▶ For GAD sensitivity is 89%, specificity is 82%
 - ▶ For SAD sensitivity is 72%, specificity is 80%

Future Directions

- ▶ While results are promising more studies would need to be done with a larger number of participants.
- ▶ Using a scale with higher sensitivity and specificity for SAD as well as GAD may also clarify results.

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