Repetitive transcranial magnetic stimulation augmentation in resistant bipolar depression

J. Nakhli, A. Braham, S. Ben Nasr
Farhat Hached university hospital, Sousse -Tunisia

Introduction:

Several studies have shown that prefrontal dorsolateral repetitive transcranial magnetic stimulation decrease depressive symptoms in resistant bipolar depression patients.

Objective:

We examined the benefit of high frequency left dorsolateral prefrontal cortex (Left DLPFC) of repetitive transcranial magnetic stimulation (rTMS) in those patients.

Methods:

During the last 3 years, four inpatients from a Tunisian psychiatric hospital in whom rTMS was used to increase efficacy of treatment were followed. All these patients had partial response to mood stabilizers drugs and were admitted in psychiatry unit for severe bipolar depression. Ten Hz stimulation at 110% motor threshold was then given in prefrontal dorsolateral cortex, 6 cm in front of frontal cortex determinate by using Magstim single stimulation coil. Patients were evaluated clinically and symptomatically on their depressive symptoms with Hamilton Depression scale at baseline, after each week and at the end of rTMS sessions.

Results:

The mean age of patients was 47 years old. Three patients were female. The total mean duration of illness was 12.5 years. Two of them had bipolar II disorder and two had bipolar I disorder. All patients take one mood stabilizer and one of them has association of lithium and valproate.

The mean number of rTMS daily session was 15.5.

We found that 3 patients of our sample have significant clinical improvement and they have a disappearance of anxiety and depressive symptoms. The average Hamilton scale improvement was 52.7%. It was respectively in the four inpatients 66%, 80%, 50% and 15%.

References:

1-DellOsso B, Mundo E, Augmentative repetitive navigated transcranial magnetic stimulation (rTMS) in drug-resistant bipolar depression.
2- Harel E, Zangen A, H-coil repetitive transcranial magnetic stimulation for the treatment of bipolar depression: an add-on, safety and feasibility study
3-Brunelin J, Successful switch to maintenance rTMS aftermaintenance ECT in refractory bipolar disorder
4-Rachid F, Moeglin C, Repetitive Transcranial Magnetic Stimulation (5 and 10 Hz) With Modified Parameters in the Treatment of Resistant
5-Poleszczyk A, M.Rakowicz, Augmentative repetitive transcranial magnetic stimulation (RTMS) in highly treatment-resistant unipolar and bipolar depression – First Polish experiences,
6-Dolberg OT, Dannon PN, Grunhaus L.Transcranial magnetic stimulation in patients with bipolar depression: a double blind,controlled study. Bipolar Disorder,
7-Ziad Nahasa, F Andrew Kozel :Left prefrontal transcranial magnetic stimulation (TMS) treatment of depression in bipolar affective disorder: a pilot study of acute safety and efficacy
8-Paul B. Fitzgerald A , KateE.Hoy , A negative double-blind controlled trial of sequential bilateral rTMS in the treatment of bipolar depression
9-Dolberg OT, Dannon PN, Schreiber S, Grunhaus L.Transcranial magnetic stimulation in patients with bipolar depression: a double blind, controlled study. Bipolar Disord 2002; 4(Suppl.1): 94–95.
10- Harel EV, Zangen A, Roth Y, Reti I. H-Coil repetitive transcranial magnetic stimulation for the treatment of bipolar depression: an add on, safety feasiblity studies. the world jopurnal of biological psychiatry 2011, 11 (2): 119-26.

Discussion:

The neuromodulatory approaches, such as repetitive transcranial magnetic stimulation (rTMS), have been demonstrated to be efficacious in randomized double-blind sham-controlled trials (RCTs) in treating depressive episodes in patients with major depressive disorder. However, it is unclear whether the antidepressant efficacy of rTMS extends to bipolar depression.

Many RCTs of rTMS in major depression have included patients with bipolar depression. Therefore, our objective was to systematically review the rTMS literature to identify bipolar patients included in randomized trials in order to synthesize the data on clinical efficacy and safety of rTMS in bipolar depression.

We retained 19 RCTs, totaling 181 patients with bipolar disorder. The RCTs employed different stimulation targets: the left dorsolateral prefrontal cortex (DLPFC), the right DLPFC, or bilateral DLPFC. The majority of studies delivered high-frequency stimulation .

Table I shows open studies and RCTs studies of efficacy of rTMS in bipolar depression patients.

Tab 1: Studies of rTMS in bipolar depression

	Authors	n	rTMS stimulation	Results
OPEN STUDIES	Dell’Osso 2009 [1]	11	RIGHT DLPFC	Decrease in HAMD de >50% for 6 patients and 25 - 50% for 3 patients.
	Harel 2010 [2]	19	LEFT DLPFC	Decrease in HDRS (12.9 points) Positive response in 63,2% cases
	Brunelin.J 2010 [3]	1	LEFT DLPFC (high frequency)	Decrease in MARDS at 8 weeks without maniac episode
	Rachid 2017 [4]	22	LEFT DLPFC (high frequency)	Decrease in MARDS (12.8 points) 40% of remission
	Poleszczyk 2017 [5]	40	LEFT DLPFC (high frequency)	Significative improvement (HAMD, BDI, GGI)
RCT STUDIES	Dolberg 2002 [6]	20	LEFT DLPFC (high frequency) vs placebo	Significative improvement after 2 weeks rTMS
	Nahas 2003 [7]	23	LEFT DLPFC (high frequency) vs placebo	No differences between 2 groups
	Fitzgerald 2016 [8]	49	Séquentiel Right DLPFC low frequency and Left DLPFC high frequency Vs placebo	No differences between 2 groups
	Dolberg 2002 [9]	20	LEFT DLPFC (high frequency) vs placebo	Improvement in HRSD, GAF
	Harel 2011 [10]	19	LEFT DLPFC (high frequency) vs placebo	Decrease in HDRS Response: 63% Remission: 52:

Conclusion:

In this resistant bipolar depression group, we showed an average response rate of 75%. The average Hamilton scale improvement was 52.7%. Our observations also support the beneficial effect of rTMS as an augmentation strategy in resistant bipolar disorder patients.

No conflict of interest