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Letter to the Editor

Low-Frequency rTMS as an alternative for suicidality and depression, in a patient with multiple medical comorbidities precluding ECT

Dear Editor,

Electroconvulsive therapy (ECT) is considered the first-line treatment for patients with severe depression and high suicidal risk (Kellner et al., 2005). However, comorbid cardiac and neurological disorders are known to increase the risk of complications with modified ECT (APA, 2001), making repetitive Transcranial Magnetic Stimulation (rTMS) a viable alternative. Though past studies (Gu et al., 2017; Jorge et al., 2004) have demonstrated the safety and efficacy of high-frequency (HF) rTMS to left prefrontal cortex in post-stroke depression, there is an inherent risk of inducing seizures with high-frequency protocols, especially in vulnerable patients. In contrast, low frequency (LF) rTMS delivered to the right prefrontal cortex is inhibitory and theoretically has a better safety profile, making it more amenable for therapeutic use in these cases (Caulfield et al., 2017). Here, we report a use of LF-rTMS in a suicidal patient with refractory depression, with left middle cerebral artery territory (lentiform nucleus) infarction, on the background of severe rheumatic heart disease precluding ECT.

A 38-years-old lady, presented with 6 months history of persistent low mood, crying spells, refusal to eat, reduced sleep and repeated suicidal gestures, along with an account of hearing accusatory 'voices'; all deteriorating over the fortnight prior to her hospitalization. A detailed medical history revealed a diagnosis of rheumatic heart disease at the age of 19-years (penicillin prophylaxis for next five years) and a conservatively-managed embolic left middle cerebral artery infarct five years back (with right hemiparesis). During current hospitalization, she continued to have residual right-paresis along with dysarthria; with minimal consequent functional impairment. While in hospital, she failed a 6-weeks trial of Fluoxetine (60 mg/day) and Risperidone (6 mg/ day), and had marginal improvement on Mirtazapine 45 mg/day & Olanzapine 20 mg/day over next 4-weeks. However, suicidal ideations, depressive cognitions and low mood persisted.

ECT was considered next, in view of suicidal risk and poor response to pharmacological treatment. A CT-scan brain showed an old infarct in the left middle cerebral artery territory, and echocardiography disclosed moderate mitral valve stenosis, mild mitral regurgitation and aortic regurgitation, with sinus-bradycardia on ECG. After consultations with the ECT anesthesiologist, the cardiologist and the patients' family members, it was concluded that her fragile cardiac status posed a substantial risk of pulmonary edema and cardiac arrhythmias with ECT.

LF-rTMS to right dorsolateral prefrontal cortex (dlPFC; 7 cm anterior to the motor hotspot for left-FDI muscle) was considered as the next best option, in view of minimal adverse effects and low propensity for autonomic stimulation. It was initiated, with informed consent, at 1-Hz, 100% of resting motor threshold (RMT), using a MagVenture-MagPro-R100 system. A total of 1200 pulses (300/train, 30 s ITI) were administered once-a-day for 6days/week. After 16th session, the dose was increased to 110%RMT and 1500-pulses (300/train, 30 s ITI). She was

https://doi.org/10.1016/j.ajp.2018.03.020 Received 6 March 2018 1876-2018/ © 2018 Elsevier B.V. All rights reserved. administered a total of 26 sessions over four-and-a-half weeks, without any significant adverse events, while pharmacotherapy remained the same. She improved gradually (Table 1). At discharge, she was asymptomatic with nil risk of self-harm. On follow-ups at 2-weeks and 3-months, she maintained remission and was optimally functional.

This case report illustrates three important clinical observations. First, LF-rTMS may be considered as a viable therapeutic option for resistant depression in medically-ill patients, where ECT is considered risky. Lack of drug interactions, minimal cardiovascular risks (Sampaio et al., 2012), protective autonomic responsiveness (Udupa et al., 2007) and relatively low seizure inducing tendency of LF-rTMS (Rossi et al., 2009) substantiate its use in this patient population. Second, LF-rTMS was successful in reducing the suicidal behavior of our patient. This observation is critical, as there are limited therapeutic avenues to be explored in medically-ill patients with suicidal tendencies. Lastly, this report demonstrated the durability of antidepressant effects of LF-rTMS for a period of 3-months in a patient with left-brain stroke. Though it is possible that our patient may have been a slow responder to antidepressant drugs, the temporal observations in our case highlight the clinical utility of LF-rTMS in improving depressive symptoms. Given the relative safety profile and effectiveness of rTMS in general and LF-rTMS in particular, this report validates the need for large-scale studies to explore their utility in patients with depression and medical comorbidity.

Table 1 Serial Hamilton Depression Rating Scale (HDRS) scores (17 item) over the course of rTMS treatment and post-rTMS follow-up.

Number of rTMS sessions	HDRS score
Pre-rTMS	24
7 Sessions	20
14 Sessions	15
21 Sessions	12
26 Sessions	10
2 weeks post-rTMS	3
3 months post-rTMS	1

Conflicts of interest

None.

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