DOI: 10.1002/pcn5.11

LETTER TO THE EDITOR

PCN Reports
Psychiatry and Clinical Neurosciences
Open Access

Repetitive transcranial magnetic stimulation for residual depressive symptoms after electroconvulsive therapy in an elderly patient with treatment-resistant depression

To the Editor,

Electroconvulsive therapy (ECT) is one of the most effective strategies for treatment-resistant depression (TRD). Although ECT is safe, old age increases the risk of cardiac events, ECT-induced amnesia, and postictal confusion.[1] If ECT is discontinued due to adverse events, subsequent treatment becomes more difficult.

Repetitive transcranial magnetic stimulation (rTMS) is a non-invasive stimulation method. The efficacy and tolerability of rTMS for TRD have been established in various sham-controlled clinical trials.[2] Moreover, rTMS has also been shown to be effective in elderly patients with TRD.[3]

While both rTMS and ECT are used to treat TRD, ECT is recommended for immediate treatment, such as when psychotic or catatonic symptoms are present. Thus, clinicians need to determine the preferred treatment for patients with TRD. Presently, there are no reports regarding rTMS treatment for residual depressive symptoms after discontinuation of ECT due to adverse events. We report the first case of rTMS after discontinuation of ECT due to adverse effects in elderly patients with TRD. Signed informed consent was obtained from the patient.

A 63-year-old man with a 6-month history of major depressive disorder (MDD) was treated in an outpatient clinic. Despite being prescribed several antidepressants (duloxetine, escitalopram, mirtazapine, and nortriptyline), the patient's symptoms gradually worsened. He was eventually hospitalized due to his inability to eat and substupor. On admission, bifrontal ECT was promptly initiated and his substupor gradually disappeared; he began to eat after the fourth session. After the fifth ECT session, postictal delirium and bradyarrhythmia occurred; therefore ECT treatment was discontinued from the seventh session. Thus, the residual depressive symptoms, mainly lack of motivation, persisted. Vortioxetine administration was started with an initial dose of 10 mg. After a week, the dose was increased to 20 mg, but there was no improvement in the depressive symptoms.

The patient was transferred to our university hospital for rTMS treatment. On admission, laboratory tests, MRI, and EEG were normal. Additionally, he scored 18 points on the 17-item Hamilton Rating Scale for Depression (HAMD-17). He subsequently underwent rTMS treatment and the administration of 20 mg vortioxetine was continued. The rTMS session was initiated a month after the ECT session ended.

Excitatory 10-Hz rTMS was delivered to the left prefrontal cortex in each session for 6 weeks (a total of 30 sessions); rTMS was applied using a NeuroStar TMS system (Neuronetics Inc.). A total of 75 trains of 10-Hz rTMS at 120% of the motor threshold were delivered for 4 s with a 26-s intertrain interval and 3000 total pulses per session. No adverse events were noted after any rTMS session. His residual depressive symptoms improved, and his HAMD-17 score decreased from 18 to 4 points after 30 treatment sessions. After completing the rTMS treatment series, he remained in remission for over a year.

A recent systematic review suggested that the efficacy in TRD was comparable between rTMS and ECT.[4] With regard to tolerability, there were no studies comparing the discontinuation rates of rTMS and ECT.[4] Moreover, cost-effective analysis revealed that rTMS had a lower cost than ECT.[4] These results suggest that rTMS is a viable alternative for TRD in the elderly.

Few studies have reported the use of both rTMS and ECT within the same major depressive episode. A previous preliminary study showed that ECT is an effective therapy in 40% of severe MDD who failed to respond to rTMS treatment.[5] Moreover, a recent randomized controlled trial reported that high-frequency TMS stimulation before ECT reduced the seizure threshold as compared to sham stimulation.[6] However, no studies have reported the use of rTMS after ECT within the same major depressive episode.

A large clinical trial of right unilateral pulse ECT with venlafaxine for older patients with depression showed a high remission rate of 61.7% during the acute treatment phase, but 28.3% of the patients dropped out and serious adverse events occurred in 5.4%.[7] These results were comparable to those of a large clinical trial of bilateral ECT in adults with MDD, which also showed a lower remission rate and more dropouts (remission rate 74.7%, dropouts 14.2%).[8] To date, no studies have reported any cases treated with rTMS after ECT and this is the first case report for rTMS after ECT. Although ECT is an effective treatment, the high rate of dropout is the critical issue and clinicians discontinued ECT in this case as well. There is no evidence

for such cases and this case report would suggest an alternative treatment option.

The objective of this case report is the possibility of rTMS after discontinuation of ECT due to adverse effects in elderly patients with TRD. The findings of this study need further research and more cases need to be evaluated to this end.

ACKNOWLEDGMENT

This study was not supported by any funding.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

ETHICS APPROVAL STATEMENT

Written informed consent was obtained from the patient.

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