

Treatment of insomnia with repetitive transcranial magnetic stimulation (rTMS) in a patient with posttraumatic stress disorder (PTSD)

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Dear Editor,

Posttraumatic stress disorder (PTSD) is a psychiatric disorder that develops after a traumatic event, characterized by specific symptoms such as re-experiencing, avoidance, blunting, hyperarousal symptoms, and non-specific symptoms such as nightmares, sleep disturbances, and impaired functioning. Sleep disorders are a very significant problem in PTSD patients and are generally resistant to treatment. Impaired sleep quality has been shown to be associated with increased PTSD symptom severity and suicidal ideation¹. Although medications and psychotherapy are at the top of the list for the treatment of PTSD, repetitive Transcranial magnetic stimulation (rTMS) has recently emerged as an important treatment option in treatment-resistant PTSD cases². In this article, treatment of insomnia with rTMS in a patient with PTSD is described.

A 45-year-old male patient was followed up for 20 years with a diagnosis of PTSD. The patient presented with a three-month history of insomnia while in remission, with treatment of lithium 1200 mg/d and sertraline 100 mg/d. No pathology was found when this patient was studied with diagnostic tests such as an MRI of the brain and an EEG applied for the exclusion of organicity, and the laboratory findings of the patient were within normal limits. No pathology was found in the patient's internal medicine, neurology, and chest consultations. The patient underwent a one-night polysomnographic measure (PSG). Sleep-apnea syndrome, snoring, and periodic leg-movement disturbances were not observed during PSG. The PSG findings supported insomnia consistent with the patient's complaints. Although the patient was treated with agomelatine, ramelteon, clonazepam, lorazepam, trazodone, herbal preparations, and quetiapine in sufficient doses and time, his complaints did not regress. It was thought that the patient would benefit from rTMS, and it was decided that rTMS should be applied.

The patient received 1500 high-frequency (10Hz) repetitive sessions with 40 pulses (four seconds each) on his left dorsolateral prefrontal cortex for 26-second pulse intervals (20 consecutive sessions/30 minutes each weekday) at 120% of motor threshold for four weeks. rTMS was performed using the Dantec magnetic stimulator (Dantec Medical A/S, Skovlunde, Denmark) for magnetic stimulation, and the Dantec MC-125 circular structure coil (Dantec Medical A/S, Skovlunde, Denmark) with an internal diameter of 90 mm was used as the stimulus coil. After rTMS, the patient's CAPS scale "difficulty falling asleep and maintaining sleep" item decreased

from 3 points to 0 points. The patient did not have any additional immediate complaints, and his complaints did not recur during the first and sixth month follow-up examinations.

As with all psychiatric disorders, sleep disorders are one of the symptoms closely related to quality of life for people who have PTSD. Moreover, sleep disorders are also closely related to the severity of PTSD. Treatment of sleep disorders is therefore very important in patient management. Although medical treatment and/or behavioral changes take the first place in the treatment of sleep disorders, our case should be taken into consideration, as it shows that rTMS treatment can be used as an alternative in treatment-resistant cases.

The effect of rTMS on the treatment of insomnia is unknown. However, there are two possible mechanisms. The first of these, noradrenaline, which has neuromodulator functions in the brain, also has an effect on sleep regulation³. It is possible that the regulation disorder that occurs in the noradrenergic system in the pathophysiology of PTSD is the cause of insomnia symptoms in our patient.¹ The effect of rTMS on the noradrenergic system, as well as serotonin, may have been effective in relieving our patient's complaints⁴. Another possible mechanism may be that the deterioration of neuroplasticity and hippocampal function, which is shown to be the cause of sleep disorders in PTSD patients, is corrected by rTMS^{4,5}. In addition, although the findings in our case support PTSD-related insomnia, it should be noted that depression or another psychiatric cause-related insomnia may have been treated.

rTMS can be considered as an alternative treatment for possible treatment-resistant sleep disorders in PTSD patients. However, randomized blind-controlled trials with PSG are needed to evaluate the efficacy of rTMS on sleep disorders.

Author contribution

Conception and design of the study: A.B. and C.Ç.; acquisition and analysis of data: I.G. and T.Ö.; drafting the manuscript: I.G. and A.B.; critical review: T.Ö. and C.Ç.; literature review: A.B. and I.G.

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