Letters

COMMENT & RESPONSE

Repetitive Transcranial Magnetic Stimulation and Tinnitus—Still a Noisy Issue

To the Editor Regarding the recently published, randomized clinical trial by Folmer et al,[1] using 1-Hz repetitive transcranial magnetic stimulation (rTMS) applied to the temporal cortex in patients with tinnitus for 10 days compared with placebo, the authors[1] reported a significant reduction in tinnitus symptoms, the primary outcome measure. However, rTMS for tinnitus is still not significantly beneficial, so we have some considerations to share:

1. Most of the randomized, sham controlled studies on rTMS for chronic tinnitus used similar, short protocols: low-frequency stimulation to the temporal cortex for 10 days or less (5 days), with some benefit in tinnitus severity and annoyance reduction, but with high interindividual variability and moderate effect. Almost all studies agree that different stimulation protocols are necessary for improvements in results.
2. Few randomized placebo-controlled trials used an rTMS protocol to the temporal cortex for 4 weeks. Piccirillo et al[2] found no benefit of active stimulation when compared with placebo. Other 4-week treatment protocols would be necessary to determine benefits.
3. Also relevant is the involvement of areas of the brain with abnormal function other than the auditory cortex. The prefrontal cortex is one of these areas, and Langguth et al[3] conducted a randomized placebo-controlled rTMS study using a combined stimulation protocol to the auditory cortex (1 Hz) and the left dorsolateral prefrontal cortex (20 Hz) with a secondary outcome favoring active stimulation over placebo. Also, De Ridder et al[4] stimulated the right dorsolateral prefrontal cortex (1 Hz vs 10 Hz stimulation) with some improvement in the 1-Hz group.
4. In rTMS for depression, more than 89 individual trials and 4 different large multisite trials have been conducted, and all found statistically and clinically significant effects of daily prefrontal rTMS for 3 to 6 weeks compared with sham studies. Data indicate that rTMS therapeutic effects likely develop over several weeks.[5] Consequently, many of the initial trials, which lasted only 1 to 2 weeks, were probably too brief to generate maximum antidepressant effects. It seems that the more the patient is stimulated, the bigger the benefit is. Perhaps for tinnitus as well, most of the studies have not reached the best possible results because of short stimulation protocols.

Thus, we emphasize the need for more rTMS studies with different protocols to optimize results for tinnitus treatment. Longer treatments, of at least 4 weeks, and different sites stimulation should be considered for future studies.

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3. Langguth B, Landgrebe M, Frank E, et al. Efficacy of different protocols of transcranial magnetic stimulation for the treatment of tinnitus: pooled analysis of two randomized controlled studies. *World J Biol Psychiatry*. 2014;15(4):276-285.

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