

[Clin Otolaryngol Allied Sci.](#) 1993 Aug;18(4):278-81.

## **Electromagnetic stimulation as a treatment of tinnitus: a pilot study.**

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This paper reports the results of a study to determine whether pulsed electromagnetic stimulation, applied over the mastoid bone, caused an improvement in the level of tinnitus in long-standing tinnitus sufferers. Fifty-eight patients from the Liverpool Tinnitus Association volunteered to take part in a double-blind placebo controlled trial. Active and placebo devices were randomly allocated to these patients on their first visit. At the end of one week of treatment, each patient noted whether their tinnitus had completely disappeared, was improved, unchanged or made worse by the treatment. Forty-five per cent of the patients who completed the trial were improved by the active device, but only 9% by placebo ( $P = 0.0013$ , Mann-Whitney test). We suggest that electromagnetic stimulation may be an effective treatment in some tinnitus sufferers.

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## **Transcranial magnetic stimulation: potential treatment for tinnitus?**

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Tinnitus is a common and often severely disabling disorder for which there is no satisfactory treatment. Transcranial magnetic stimulation (TMS) is a new, non-invasive method of modifying the excitability of the cerebral cortex, which has proven effective in auditory hallucinations and other disorders. Some early studies have been published in which TMS has been trialed in the treatment of tinnitus. The aim of the present paper was to examine the literature and consider the potential for TMS as a therapy in tinnitus. A thorough search of the tinnitus and TMS literature was conducted, and all available relevant material was examined.

Discussions were held with leaders in both fields. Tinnitus is common and there are no effective treatments. It is frequently associated with deafness, and may be the result of a pathological plastic process, secondary to loss of innervation of the outer hair cells of the cochlea. Neuroimaging studies demonstrate increase blood flow to the primary and secondary auditory cortices, particularly on the left side. Transcranial magnetic stimulation is a non-invasive method of perturbing and inducing change in the cerebral cortex. It uses electromagnetic principles and has been successfully employed in the treatment of other conditions associated with increased activity of the cerebral cortex. A small number of studies have suggested that TMS may be effective in the treatment of tinnitus. There is a good theoretical basis and early research evidence suggesting that TMS may have treatment potential in tinnitus. Further, larger studies are necessary.

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[Vestn Otorinolaringol.](#) 1998;(1):59-60.

## **[Treatment of subjective noise in the ear by impulse low-frequency electromagnetic field (preliminary results)]**

[Patiakina OK](#), [Antonian RG](#), [Zagorskaia EE](#).

25 patients with subjective noise in the ears, primarily in neurosensory hypoacusis, were exposed to pulse low-frequency electromagnetic field (PLFEMF) generated by INFITA unit with attached device ELEMAGS. The noise complaints began 1 to 10 years before. The previous conservative therapy failed. PLFEMF eliminated the noise in 2 patients, reduced it noticeably (by 60%) or changed its tone in 19 patients. At 6-12-month follow-up positive effect persisted. The results of the study allow the authors to recommend PLFEMF for wide clinical practice.

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