Neurofeedback for treating tinnitus.

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Author information

Abstract

Many individuals with tinnitus have abnormal oscillatory brain activity. Led by this finding, we have developed a way to normalize such pathological activity by neurofeedback techniques (Weisz et al. (2005). PLoS Med., 2: e153). This is achieved mainly through enhancement of tau activity, i.e., oscillatory activity produced in perisylvian regions within the alpha frequency range (8-12 Hz) and concomitant reduction in delta power range (0.5-4 Hz). This activity is recorded from electrodes placed on the frontal scalp. We have found that modification of the tau-to-delta ratio significantly reduces tinnitus intensity. Participants who successfully modified their oscillatory pattern profited from the treatment to the extent that the tinnitus sensation became completely abolished. Overall, this neurofeedback training was significantly superior in reducing tinnitus-related distress than frequency discrimination training.

Auris Nasus Larynx. 2011 Dec;38(6):735-8. doi: 10.1016/j.anl.2011.02.003. Epub 2011 May 17.

Neurofeedback for subjective tinnitus patients.

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Abstract

OBJECTIVE:

Previous studies report that enhanced power in the delta range (1.5-4Hz) and reduced power in the alpha frequency band (8-12Hz) were most pronounced in the temporal regions. These studies referred to the 8-12Hz activity as tau activity, and they created a new neurofeedback protocol to treat tinnitus using a temporally generated tau rhythm (8-12Hz) and slow waves in the delta range (3-4Hz) for feedback. This study aims to repeat this protocol and to evaluate its effect on tinnitus.

METHODS:

Fifteen normal-hearing patients with tinnitus were treated with the neurofeedback protocol. The Tinnitus Handicap Inventory and Visual Analogue Scales were administered before and after treatment and at 1, 3 and 6 months post-treatment.

RESULTS:

After therapy, all questionnaires scores were significant improved, and the improvements persisted throughout the followup period. Moreover, an increasing trend in the tau/delta ratio was observed; specifically, the trend was more stable respect of the pre-recording measure. However, only in some subjects may the signal alone be enough to develop the correct behaviors.

CONCLUSION:

Further studies are necessary to characterize the tinnitus subjects who recovered from and adapted to this psychophysical condition and, therefore, responded to neurofeedback therapy.

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