

AN EXTINCTION TRAINING FOR TINNITUS

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It was previously shown that tinnitus alters the tonotopic map in auditory cortex (Mühlnickel et al., 1998) and that the magnitude of the reorganisation is significantly positively correlated with tinnitus intensity. We also observed tinnitus-related cortical hyperactivity that was independent from hearing loss but was also positively correlated with parameters like tinnitus intensity and interference (Diesch et al., 2004). A training of frequencies in the areas close to the tinnitus frequency had moderate effects on tinnitus intensity and (Flor et al., 2004). In our latest study we examined emotional processing of visual stimuli in acute and chronic tinnitus sufferers as compared to healthy controls (Flor et al., 2004). Tinnitus sufferers as compared to healthy controls showed significantly higher BOLD responses in neuronal feedback loops involving auditory association cortices and limbic structures. These findings support the assumption of a central hyperactivity specific to tinnitus. In the proposed study we plan to extend our training efforts and plan to address the general hyperactivity by using a centrally acting pharmacological intervention. The proposed training aims at providing sounds to tinnitus patients that induce residual inhibition (RI) and to train the patients to extend residual inhibition and thus obtain extinction of the tinnitus percept and negative emotional responses. Secondly, we want to test the additive effects of the calcium channel modulator pregabalin vs. placebo on the training effects. Both tinnitus severity and interference related to tinnitus will be used as outcome variables. On the physiological level we want to assess effects of the training on habituation of the N100 of the electroencephalogram as well as the skin conductance response to tinnitus-like and control tones in addition to effects on tinnitus severity and interference and RI control. We plan to assign 28 chronic tinnitus patients to a training group + pregabalin and a training group + placebo on a randomized double-blind basis. This group design will be combined with a multiple baseline design in which small groups of patients successively enter treatment 2, 4, 6, or 8 weeks after the assessment thus providing variable waiting periods that will be used to assess tinnitus parameters and can be used to control for time effects. Patients will train half an hour each day to prolong the RI via imagery, and take the substance in parallel. Before and after the eight weeks of training, habituation parameters in the EEG and the SCR will be assessed and tested for training effects.

References

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