

ALTERATION OF TINNITUS SENSATION THROUGH OPERANT MODIFICATION OF ABNORMAL EEG-SPECTRA

K Dohrmann, W Schlee, T Elbert, N Weisz

University of Konstanz, Konstanz, Germany

Background and Purposes It is commonly believed that tinnitus is related to chronic alterations in the central nervous system. However, the causal relationships between central changes, such as altered oscillatory properties with perceptual phenomena, are still not clear. In a recent study we have demonstrated an abnormal spontaneous activity pattern in tinnitus patients marked by a reduction in alpha and enhancement in delta power, particularly in temporal regions. The aim of the present study was to change the aberrant spontaneous activity through neurofeedback and thus to modify the tinnitus sensation.

Methods Twenty-one patients participated in neurofeedback training with three different protocols: they had either to reduce the delta power or increase the alpha power or both. Before and after each session we recorded the intensity of the tinnitus and five minutes of resting EEG.

Results On average the patients changed their abnormal cortical activity of about 71% (range of changes between -32% and 325%), irrespectively of the training protocol. Patients managing to alter both bands in the desired direction profited most. The correlation between the “training success” and the “tinnitus intensity change” is $r = -.74$ ($t(18) = -4.69$, $p < .001$)

Discussion and Conclusion By showing that changes in alpha and delta power can vary the intensity of tinnitus, the present results support assumptions that the altered spontaneous activity pattern found might be a neuronal signature of tinnitus. Implementing this knowledge into interventions and therapies can directly benefit tinnitus sufferers.

Katalin Dohrmann
University of Konstanz
Department of Psychology
PO-Box D 25
78457 Konstanz, Germany

Phone: +49 (0)7531 884612
Fax: +49 (0)7531 884601
Email: katalin.dohrmann@uni-konstanz.de