

AS21-03 - EFFECT OF LOW-FREQUENCY RTMS ON ELECTROMAGNETIC TOMOGRAPHY (LORETA) AND REGIONAL BRAIN METABOLISM (PET) IN SCHIZOPHRENIA PATIENTS WITH AUDITORY HALLUCINATIONS

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Background: It was repeatedly reported that low frequency (≤ 1 Hz) repetitive transcranial magnetic stimulation (rTMS) diminishes treatment-resistant auditory hallucinations.

Objectives: To evaluate the distribution of neuronal electrical activity and the brain metabolism changes after low-frequency rTMS in patients with auditory hallucinations.

Methods: rTMS (0.9Hz, 100% of MT, 20 min.) applied to the left temporo-parietal cortex was used for ten days in the treatment of medication-resistant auditory hallucinations in schizophrenia (N=12). The effect of rTMS on the low resolution brain electromagnetic tomography (LORETA) and brain metabolism (¹⁸FDG PET) was measured before and after two weeks of treatment. In a subsequent double blind sham controlled cross-over study (N=15), the low frequency rTMS was applied using i) "neuronavigation" according to an individual metabolic local maxima of ¹⁸FDG PET uptake; ii) "standard" positioning, and iii) inactive "sham".

Results: The rTMS decreased the brain metabolism in the left superior temporal gyrus and in interconnected regions and effected increases in the contralateral cortex. We detected a decrease of current densities (LORETA) for the beta-1 and beta-3 bands in the left temporal lobe whereas an increase was found for beta-2 band contralaterally. The PET neuronavigated rTMS compared to both standard and inactive rTMS, revealed better outcome.

Conclusion: The LORETA and PET indicate that the neuroplastic changes provide the substrate for a clinical effect. Congruently, ¹⁸FDG PET navigated rTMS allows an individual approach to therapy of patient with treatment-resistant acoustic hallucinations.

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