Article: EPA-1676
Topic: P28 - Psychosurgery & Stimulation Methods (ECT, TMS, VNS, DBS)

LONG-TERM EFFECTS OF PLACEBO-CONTROLLED PREFRONTAL EEG-NEUROFEEDBACK TRAINING IN HEALTHY SUBJECTS

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INTRODUCTION

In this study we evaluated long-term effects of frontal beta EEG-neurofeedback training (E-NFT) in healthy subjects. We hypothesized that E-NFT can change frontal beta activity and that changes in frontal beta EEG activity are accompanied by altered cognitive performance changes.

METHODS

19 healthy women and 6 healthy men participated in this study. The subjects were randomly adjusted to a real E-NFT or a placebo E-NFT. EEG was recorded by means of a Deymed Truscan 32-channel system with 19 channels before E-NFT (t1), post to the training sessions (t2) and 3-years after E-NFT (t3). For E-NFT an average of respectively 14.3 and 13.2 training sessions were completed for experimental and control group. Each trainingsession took approximately 45 minutes; training-protocol: increase 12-18 Hz at Fz-electrode, auditory and visual feedback was given if EEG activity was increased at Fz for at least 1second.

RESULTS

Compared to the sham E-NFT, which was used for the control group, real E-NFT increased beta activity in a predictable way (post-measurement1 after NFB training, t2, post-measurement after 3years, t3). However, regarding our sample of healthy subjects E-NFT did not result in significantly improved cognitive performance.

DISCUSSION

The main finding of the present study was an increase in cortical frontal beta activity after E-NFT. We also found evidence of a long-term effect on the basis of a follow-up measurement after three years. Based on our results we conclude that EEG-NFT can selectively change EEG beta activity, in the short and long term.

https://doi.org/10.1016/S0924-9338(14)78820-0 Published online by Cambridge University Press