Effects of Neurofeedback Versus Stimulant Medication in Attention-Deficit/Hyperactivity Disorder: A Randomized Pilot Study

Geir Ogrim and Knut A. Hestad.

Østfold Hospital Trust, Norway

Neuropsychiatric Unit, Child and Adolescent Psychiatry

E-mail: geir.ogrim@so-hf.no

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Objective: The purpose of this pilot study was to compare the effects of 30 sessions of neurofeedback (NF) with stimulant medication on attention-deficit/hyperactivity disorder (ADHD) patients.

Methods: Thirty-two medication-naïve ADHD patients, ages 7–16, from a neuropsychiatric clinic, were randomized to NF (n=16) or drug treatment (n=16). Other actions, such as parent management training, information, or support in school were given as needed, with no differences between the groups. All participants were assessed before treatment on two rating scales, each with parent and teacher forms. In addition, quantitative electroencephalogram (QEEG) and event-related potentials (ERPs), which included behavioral data from a go/no go test were administered. NF training took place in the clinic over a period of 7–11 months, and was followed by a repeat of the same assessment tools. The mean time interval between pre- and postassesment was not significantly different in the two groups. The 18 symptoms of ADHD (American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders, 4th ed. (DSM-IV)) were used as the primary outcome measure.

Results: Analysis of covariance revealed a significant difference between the groups at evaluation in favor of medication, with a large effect size. This picture was confirmed by other outcome measures. The QEEG spectral power in the theta and beta bands did not change in either group. In ERP, the P3 no go component increased significantly in 8 of 12 patients who had a clinically relevant medication effect, but did not increase in the medication nonresponders or the NF group.

Conclusions: Our study supports effects for stimulants, but not for NF. Effects of NF may require thorough patient selection, frequent training sessions, a system for excluding

nonresponders, and active transfer training. The P3 no go ERP component may be a marker for treatment response.