A Comparison of EEG Biofeedback and Psychostimulants in Treating ADHD

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The study compared treatment programs with EEG biofeedback or stimulants as their primary components. An EEG group (EEG) was matched with a stimulant group (MED) by age, IQ, gender and diagnosis. The Test of Variables of Attention (TOVA) was administered pre and post treatment. EEG and MED groups improved (p < .05) on measures of inattention, impulsivity, information processing, and variability, but did not differ (p > 0.3) on TOVA change scores. The EEG biofeedback program is an effective alternative to stimulants and may be the treatment of choice when medication is ineffective, has side effects, or compliance is a problem.

The purpose of the study was to examine the efficacy of 20 sessions of EEG biofeedback in reducing AD/HD symptoms and to compare the results with those obtained with psycho stimulant medication. Psychostimulants are the most widely used treatment for AD/HD (Barkley, 1990). In order to be a widely accepted alternative to medication, EEG biofeedback must be able to produce equivalent symptom reduction.

Reports documenting the use of EEG biofeedback in the treatment of attention deficit hyperactivity disorder (AD/HD) began to appear in the literature in the mid 1970's (Lubar & Shouse, 1976). In recent years the use of this treatment has become more widespread and has received increasing attention from the professional community and the public. The increased professional interest may be due to a number of factors including the reported effectiveness of the treatment, the availability of relatively inexpensive, high quality, quantitative EEG equipment, an expanding number of opportunities for training in the use of EEG biofeedback, and the emergence of scientific interest groups that have facilitated the promulgation of information in this area.

The study demonstrated that a treatment program with EEG biofeedback as the major component led to significant reduction in both cognitive and behavioral symptoms of AD/HD after 20 treatment sessions completed over a period of four to seven weeks. The EEG group manifested significant improvement in attention, impulse control, speed of information processing and consistency of attention on the TOVA. BASC questionnaires completed by mothers confirmed the reduction in AD/HD symptoms and also indicated a decline in internalizing and externalizing psychopathology. In every case where parents and/or teachers reported significant improvement in behavior or school performance, corresponding improvement in the TOVA performance was observed. This confirms that improvement was not limited to TOVA test scores, but had generalized beyond the clinic and was observed as symptom reduction in the patients' daily lives. More importantly, the EEG biofeedback program
led to improvement on all four TOVA outcome variables that was equivalent to that obtained with the medication pro-ram. The EEG program is an effective treatment for AD/HD and a viable alternative to the use of psychostimulant medication. The results indicating significant reduction of AD/HD symptoms with EEG biofeedback are consistent with those reported by Lubar (1991), S. F. Othmer and S. Othmer (1992), Linden, Habib & Radcjevic (in press), Cartozzo, Jacobs & Gevirtz (1995) and Scheinbaum, Zecker, Newton & Rosenfeld (1995). Moreover, the improvement was evident in far fewer than the 40-80 sessions sometimes cited as the expected course of treatment (Barkley, 1992). This allows for conservation of health care resources by identifying patients who are not responding to treatment earlier in the treatment process.

The EEG biofeedback program is an effective treatment for AD/HD and may be the treatment of choice in cases where medication is ineffective, only partially effective, has unacceptable side effects, or where compliance with taking medication is low. In addition, 60-70% of children with AD/HD continue to have symptoms of the disorder into their adolescent and adult years (Weiss & Hechtman, 1994). Since psychostimulants do not result in any lasting reduction of AD/HD symptoms, their use must be continued indefinitely if the symptoms are to be controlled. By the time many children reach adolescence, they are no longer willing to take psychostimulants whether they had responded favorably in the past or not. For this reason, there is a substantial population of AD/HD adolescents and young adults for whom medication is not an acceptable treatment option. The EEG biofeedback program provides an alternative for this group of patients.

Among patients who have a good response to medication, the choice between EEG biofeedback and medication is not as clear cut. The EEG program is more expensive in the short run than the medication program. However, the cost differential may be declining due to better pretreatment assessment and more efficient treatment protocols. S. Othmer (1994) reports that training is successfully completed in 20 sessions for at least 30% of AD/HD patients. The EEG biofeedback program is a cost effective alternative to the long term use of medication if it results in lasting symptom reduction, particularly if the patient is one of the 60-70% who will not "outgrow" the disorder. One to ten year follow-up of successfully treated patients suggests that EEG biofeedback leads to long term symptom reduction (Othmer, S., Othmer, S. F., & Marks, 1991; Lubar, 1995; Tansey, 1993). These reports are encouraging but need to be confirmed by systematic follow-up studies with larger samples of patients using objective assessment procedures such as the TOVA, standardized academic achievement tests, etc.