BRAINWAVE ENTRAINMENT: A COMPLIMENTARY THERAPY IN THE TREATMENT OF CHILDREN DIAGNOSED WITH ADHD

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a recognized disorder by the American Medical Association (AMA), the American Psychological Association (APA) and the American Academy of Pediatrics (AAP). ADHD is considered a neurological condition that involves serious deficiencies in behavioral inhibition and sustained attention. Untreated, ADHD can cause devastating academic and interpersonal problems, resulting in low self esteem, as well as secondary depression and anxiety.

The most common cause of ADHD is inheritance. Over 70% of individuals with ADHD have a family member (parent, grandparent, aunt, or uncle) with the disorder. Research with twins, even identical twins who grew up in different homes, strongly supports the genetic link. For those who do not inherit ADHD, the cause is most often related to physical problems occurring during pregnancy or at birth. Among these problems include: loss of oxygen during birth (as can occur when the umbilical cord wraps around the neck), toxemia (blood poisoning by toxins from a local bacterial infection) substance abuse or smoking by the mother during pregnancy, teenage pregnancies, and premature birth. Low levels of lead or mercury poisoning (like from lead paint) can also produce ADHD-like symptoms. It has also been noted that for unknown reasons, children born in late August, September, and early October are also at higher risk for ADHD.

Diagnosing ADHD

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) that 3%-7% of school-aged children have ADHD. However, studies have estimated higher rates in community samples.

Assessing ADHD is difficult because many of the symptoms cannot be observed in a 45 minute office visit. Therefore, a thorough evaluation conducted by mental health or medical professionals will often include behavioral checklists completed by a variety of sources such as parents, teachers, after school program staff, and other community members that have significant contact with the child. Behavioral observations of the child are also often part of a sound ADHD evaluation and many mental health professionals also include neuropsychological and other psychological testing to screen for mental health issues that may present as ADHD symptoms or may coexist with ADHD (depression, anxiety, bipolar disorder, learning disabilities, etc). An accurate diagnosis of ADHD is essential to selecting the most appropriate behavioral, psychological, medical, and environmental treatments.

Treatments for ADHD

Treatments for ADHD can be divided into those which are well researched and established and those which may be helpful but do not yet have adequate scientific data to be considered fully validated. One of the most researched and established forms of treatment for ADHD includes the use of stimulant medication. One current view within the medical field is that ADHD symptoms are the result of an insufficient flow of dopamine within the brain. Stimulant medication is believed to increase the flow of dopamine for those with ADHD and has been shown to have dramatic effects on children's ability to sustain attention, think before they act, and decrease hyperactivity. Another well established form of treatment for ADHD is the use of a behavior program. This usually includes a structured daily and weekly plan designed to gradually reinforce better self control and compliance. These programs have specific daily and weekly goals and behaviors are monitored and rewarded when meeting daily and weekly goals.

One treatment that is effective but is not as well researched is brainwave entrainment. Some research indicates that children with ADHD have an excess of theta brainwave activity and an insufficient amount of beta activity. The treatment for this would be to increase beta waves and decrease theta waves. It is also noted that some people with ADHD have high levels of beta activity. In this case, treatment would involve reducing the amount of beta waves.

Based on the review of the online literature, there are three types of brainwave entrainment that are currently being used in the treatment of ADHD:

Neurofeedback: Electroencephalograph (EEG) biofeedback involves placing a few electrical leads on the scalp and then measuring and analyzing the person's brain wave patterns. The information is "fed back" to the ADHD sufferer via a computer screen to let them know when they are producing the desired patterns, ones associated with concentration and calmness and when they are not. Some children and adolescents are reported to have dramatic behavioral improvements. However, problems arise for many in transferring the learning from the training sessions to daily situations. It can also be very tiring for the client. Additionally, this treatment requires great commitment from the patient and family since it involves many office training sessions over a period of months and it is costly. There are reportedly no physical side effects to EEG Biofeedback.

LENS (Low Energy Neurofeedback System): LENS also uses an EEG and electrical sensors to acquire brain wave information. However, the goal of this system is to "disentrain" the brain. The developer of this system, Dr. Len Ochs, found that one does not need to tell the brain what to do as in the active Neurofeedback system mentioned above. The LENS program feeds back the same brainwaves and adds an extremely small radio frequency, called an offset, resulting in the brain self-adjusting and minimizing its dysfunction. Compared with traditional Neurofeedback, the LENS process requires no work by the client and reportedly accomplishes improved functioning in much less time and at a much lower cost.

Binaural beats: With this type of entrainment, one listens to music that consists of two tones that are close to each other in pitch. For example, one tone could be 528 Hz and the other could be 536 Hz. What one hears is the difference between those two sounds. According to the Monroe Institute, if the difference between the tones matches a particular-brain wave state, say 12-24 Hz beta range, then ones overall brain activity will maintain that brain-wave state. The effectiveness of binaural beats is reported to be immediate and can last up to an hour or more. Unlike the two Neurofeedback forms of treatment mentioned above, use of binaural beats does not involve the use of an EEG to monitor effects.

Implementing the use of binaural beats

ADHD can be a very challenging condition. There is no cure, but there are forms of treatment that can help one with ADHD reach their full potential. Brainwave entrainment, specifically binaural beats, could be used with relative ease and cost to assist children struggling with ADHD. From a clinical perspective, the times that binaural beats could be most effective include using binaural beats designed to help increase attention while children are doing their homework, using binaural beats that are designed to gradually lower beta waves after children play videogames (to prevent an "emotional crash or shutdown) and using binaural beats to assist children with sleep onset as these situations are often very challenging for children with ADHD and their families. Binaural beats may just prove to be another tool parents could use to help their child manage their ADHD symptoms.

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