

Biofeedback Pediatric Migraines

Biofeedback is a type of treatment proven to reduce the symptoms of childhood migraines. It is intended to teach patients self-regulation of certain physiological processes not normally considered to be under voluntary control, such as heart rate, breathing, muscle tension, and blood vessel constriction. These autonomic nervous system processes can influence the frequency and severity of migraines. For migraine headaches, electromyography (EMG) measures the muscle contraction of the frontalis muscle of the forehead. Skin temperature feedback data (thermal biofeedback) is also used. Thermal biofeedback (training a person to increase their own body temperature) is an effective technique used by many migraine patients to reduce the pain intensity and frequency of their headaches. Patients achieve control of their physiological responses through a combination of visualization, voluntary relaxation, and mechanical feedback. In this technique, a temperature sensor is placed on the finger, and the patient is taught to increase the temperature which reduces or prevents the migraine.

The typical biofeedback training program consists of 10 to 20 training sessions of 30 to 50 minutes each. Training sessions are performed in a quiet environment. Patients are taught to use specific visualization and muscle relaxation skills to affect the physiological variables monitored. Biofeedback video games, sensory lights, and music are also used to make learning the techniques interesting and fun for children.

Relaxation training and biofeedback have proven to be promising treatments for children with migraine headaches. A recent review article (Hermann & Blanchard, 2002) summarized headache/biofeedback research to date in children and concluded that thermal biofeedback is effective in alleviating headache activity in children; most studies showed that more than two-thirds of the children had a 50% symptom reduction. Most protocols used 10 sessions or fewer and included home practice; some involved the parents also. For example, five children with tension-type headaches (Arndorfer & Allen, 2001) participated in a multiple-baseline, time-lagged, within-subject design using thermal biofeedback. All learned the hand-warming technique and showed significant clinical improvement. Six months afterward, 80% were headache-free. Labbe (1995) studied thermal biofeedback-assisted autogenic training in 30 migrainous children; 80% of children receiving biofeedback for pediatric migraines had significant improvement. Finally, Damen et al. (2006) conducted a systematic review of 19 studies of nonpharmacological treatment in children; they reported biofeedback with relaxation was the most effective for treating pediatric migraines.

References

Arndorfer, RE, & Allen, KD (2001). Extending the efficacy of a thermal biofeedback treatment package to the management of tension-type headaches in children. *Headache*, 41(2), 183-92.

Damen, L, Bruijn, J, Koes, BW, Berger, MY, Passchier, J, & Verhagen, AP (2006). Prophylactic treatment of migraine in children: Part 1. A systematic review of nonpharmacological trials. *Cephalalgia*, 26(4), 373-383.

Hermann, C & Blanchard, EB (2002). Biofeedback in the treatment of headache and other childhood pain. *Applied Psychophysiology & Biofeedback*, 27(2), 143-162.

Labbe, EE (1995). Treatment of childhood migraine with autogenic training and skin temperature biofeedback: A component analysis. *Headache*, 35(1), 10-13.

Siniatchkin, M, Hierundar, A, Kropp, P, Kuhnert, R, Gerber, WD, & Stephani, U (2000). Self-regulation of slow cortical potentials in children with migraine: an exploratory study, *Applied Psychophysiology & Biofeedback*, 25(1), 13–32.