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Thermal Biofeedback Training in Children with Headache

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Two young girls with a history of headaches were trained with autogenic training phrases and with thermal biofeedback training. Subject L.S. (age 9) had suffered serious spells of vertigo complicated with nausea since the age of 3, which by the age of 5 increasingly transformed itself into a typical migraine. Subject J.C. (age 13) had had recurrent headaches since the age of 5; they were often bilateral and included nausea and vomiting (not a typical childhood migraine). Both girls rapidly learned to control their peripheral temperature in two training sessions while practicing for 3 weeks at home and at school with and without equipment; both have been symptom-free (without medication) for the last 6 months. Unlike adults, in whom training must first remove the accumulated self-destructive patterns, both girls learned very rapidly and accepted this as a natural process. This learning process may foster a shift in health attitudes from helplessness to self-responsibility.

So far as we know, autogenic biofeedback training as a preventive for headaches in children has not been attempted before. We would like to report some findings with two young girls which suggest that training children to learn new antistress techniques and preventive health habits may actually be teaching them a different attitude toward health: health is one's own responsibility.

Headaches and especially migraines are still a medical enigma, and the exact cause is unknown even though the symptoms are clearly mediated through the autonomic nervous system. Stress often precipitates a headache episode. Although there have been many attempts at classification of headaches, it appears in all cases observed by photographic thermography that there is an imbalance of temperature, and therefore of blood flow, in the head.^{1,2} By regulating the blood flow, or controlling muscle tension by voluntary control of the autonomic nervous system, headaches may be ameliorated.

Recently thermal and electromyographic feedback programs, supplemented with variations of autogenic training or Jacobson progressive relaxation, have been used as a treatment paradigm for headaches. Budzynski, Stoyva, and Adler³ found that there was a significant reduction in headache activity when they trained adults tension-headache patients with electromyographic feedback. For 8 weeks the subjects learned to decrease their frontalis muscle tension. The reduc-

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tion in headache activity held for both the 8-week training period and the 12-week follow-up period. Sargent, Green, and Walters⁴ have used autogenic training phrases and thermal feedback with 90 adults who had migraine to achieve an 80% reduction in migraine activity in a 3-month training period. Autogenic feedback training paradigms are partially derived from Luthe and Schultz,⁵ who report that with autogenic training a majority of patients respond with lessening of frequency and intensity of headaches. Learning low muscle activity as well as increasing hand warming (generalized vascular dilation) is the opposite physiological response to those brought on by stress. To learn this voluntary control, the person attempts to carry the more relaxed state within him in all phases of his life, which implies that he subtly changes his life-style and attitude.

THERMAL FEEDBACK TRAINING WITH TWO YOUNG GIRLS WHO HAD A HISTORY OF HEADACHES

Subject L.S., age 9, at age 4 was having episodes of vertigo, pallor, and vomiting, often followed by sleep. She had a number of the episodes, and finally a neurologist made the diagnosis of benign aural vertigo, otherwise known as Basser's disease. At age 5 she began having some episodes with headaches, which were typical migraine with vomiting followed by sleep. The episodes of vertigo became less frequent while the episodes of migraine became much clearer. The migraine became somewhat milder around age 7, but the episodes became longer. By age 8, she was having no more episodes of vertigo but was having migraines very regularly, probably several times a month.

Training. Initial autogenic training was started on May 17, 1973, when she had a severe headache. Her father taught her the autogenic phrases that evening during the migraine and she cured herself of the migraine within the hour. Since that time, she has been essentially headache-free. In September, in order to authenticate the temperature warming and autogenic training, she was given two thermal biofeedback training sessions. She took a temperature unit home for 2½ months to continue the practice. By the second biofeedback training session she was able consistently to warm her hands as much as 10 degrees. She reported that she warmed her hands by thinking and feeling: "I was swimming in spaghetti and meatballs"; "I felt gooey and warm, I kept saying warm, warm, warm"; or "I felt chicken soup flowing down my arm."

Although she has had no headaches, just recently she has had one severe dizziness spell, which may mean that although she has learned to warm her hands, she has not practiced faithfully. We feel that in order to be successful, the subject has to adopt a slightly different attitude toward life or, in her case, to carry the relaxed feeling with her all the time. This has currently been reemphasized, with instructions to feel a warm cocoon around herself throughout the day.

Subject J.C., age 13, at age 5 had severe headaches with frequent vomiting, often followed by sleep. She had a sense that the headache was coming, although she reported no specific sensations. Her headache was either frontal or occipital, like a tight band. The severity of the headache, sleep, the vomiting, and the

prodrome are classical migraine symptoms. The headaches tended to be on Thursday, Friday, and Saturday and were erratic in frequency.

Training. She was first seen in September 1973 for thermal biofeedback training and rapidly learned to increase her hand temperature. Both with her and with L.S., during the training session, the classic technique of autogenic training was not used, but analogies were made to self-control and Houdini; we emphasized that she could totally control her own body and need not be at the mercy of others. After a 2-week interval she was seen again and could increase her hand temperature from 87° to 96° F. and reported that her hands and feet were glowing. She practiced off and on with the machine for about 2 months.

In addition, each girl was encouraged to practice without the feedback unit at home and in school, and to keep a daily log.

Subject J.C. reported that she warmed her hands in the following manner: "(1) I thought to myself that I was in control of everything. (2) Fingers get warm. (3) Fingers, I feel them warming. (4) Warm toast, lobsters, ovens, summer. (5) I would look at the meter. (6) I would be proud of myself because I had succeeded." The training has been successful till now and she has been headache-free since the training was started.

The preliminary report gives encouragement that biofeedback training may be extremely useful in children especially if the process is designed as one of play—self-exploration and self-responsibility. Both subjects learned temperature training in one session and practiced the skill willingly at home with the feedback unit. There appeared to be no previous constraints in their attitudes that said "you cannot do it." In fact, the experimenters assumed that the child could do it. The very quick skill acquisition, unlike the experience with adults,^{3,4} was rapid and was accepted as something very natural. Possibly there are no accumulated self-destructive habit patterns, since life habits were not yet well established and autonomic learning processes are not marked by the belief structure that questions, "Is it possible?" of our rational thinking, which says, "I have to understand it before doing it."

Moreover, J.C. spontaneously generalized the learning process to other body systems that she apparently could feel. She reported that with a similar technique, but not with actual feedback, she moved her teeth faster so that her orthodontic headgear could come off sooner. As she says, it worked. In her six-step process, in step 2 she says, "Teeth move"; in step 3, "I can feel them moving"; so that "instead of having to wear my headgear for two years all day long, and then move onto nighttime, I only had to wear my headgear for four months. Now I'm on nighttime wear."

Whether or not she actually moved her teeth more rapidly is not the issue; however, it does imply a different concept of reality in which one can be responsible for one's own health and growth. What may be possible is inevitably limited by the boundaries of one's own belief.

Biofeedback training, used wisely, and if the subject generalizes the skills, may teach an attitude toward health that can buffer him against stress and encourage his own sense of self-esteem. We are encouraged that biofeedback training for children may be useful in numerous childhood symptoms. The newly

learned experiences may prevent the child from becoming a drug-dependent patient in his adult life.

EPILOGUE

At a 5-year follow-up, both girls are found to be headache-free.

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