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Acupuncture as an Antiemetic: Is There a Point?

By Christine M. Stoltz, MD

THE NEW MILLENNIUM HAS BRED CONTINUED INTEREST IN THE therapeutic effects of acupuncture. What was initially regarded as a mystical Asian cultural practice has found a secure position in popular American culture. Americans made more than 5 million visits to acupuncturists in 1997,[1] and this number is expected to be much larger in 2002.

Therapeutic use of acupuncture by patients has outpaced acupuncture research. Although acupuncture has been used in the treatment of a variety of medical conditions, clinical research suggests that it may be useful for postoperative dental pain, as an antiemetic during pregnancy and cancer chemotherapy, and in patients with neuropathy, headache, and low back pain syndromes. The National Institutes of Health Consensus Development Conference found that "there is clear evidence that needle acupuncture is efficacious for adult postoperative and chemotherapy nausea and vomiting and probably for the nausea of pregnancy."[2] The following provides an overview of acupuncture and its potential efficacy as an antiemetic.

Background

Acupuncture is a family of therapies in which medical conditions are treated by stimulation of anatomic points on the skin. Its practice dates back to at least the first century BC in China.

The basis of acupuncture is the notion that vital energy or *Qi* (pronounced "chee") flows in specific pathways (called meridians) throughout the body. Although they are not discrete structures, meridians are conceptually similar to blood vessels: They supply certain structures and organs in the body with energy and should align in a predetermined manner. It is believed that meridians are interconnected, permitting flow between them. There are 12 major and eight minor meridians. Meridians are important because traditional Chinese medicine teaches that symptoms of disease result from an imbalance of Qi in one or more meridians. Along each meridian is a series of acupuncture points. The intention of the acupuncturist is to detect abnormalities in Qi, and then redirect it and re-establish proper flow using acupuncture points.

INSIDE

Technique

There are several different styles of acupuncture. The most basic technique is needling, in which fine needles (approximately 32-gauge) are inserted about 0.5-1.0 cm below the skin's surface. Modifications of this technique include electroacupuncture, in which small amounts of electric current pass through the needle, and moxibustion, in which a Chinese herb called moxa is heated and held near or placed on the acupuncture point. Some therapists also may use laser stimulation of specific acupuncture points to yield the same result. Acupressure is a related technique in which manual pressure (instead of needles) is placed at specific acupuncture points, using fingers or specially designed bands. Using a combination of reported symptoms and physical findings, the acupuncturist determines one of more locations where Qi is disrupted and uses acupuncture or acupressure to redirect flow to its native pattern.

Potential Mechanisms of Acupuncture's Antiemetic Action

Human research concerning the mechanisms of the antiemetic effects of acupuncture is lacking. Many of the human studies have been limited by a lack of appropriate controls and by small study populations.

Small-scale animal studies, mostly from the Chinese literature, have suggested several effects on gastrointestinal function, including increased gastric motility (as measured by strain gauges), decreased acid secretion, and release of B-endorphin and somatostatin. Such studies have used dogs or rabbits and employed variable acupuncture sites. Although there may be a demonstrable effect in other mammals, such studies need to be interpreted with caution, as no information about efficacy can be derived, and it is assumed that acupuncture sites are the same in animals. As in humans, blinding is difficult in these studies.

Clinical Studies of Acupuncture as an Antiemetic

Several studies concerning the antiemetic effects of acupuncture have focused on an acupuncture point called Pericardium 6 (P6). This point is located on the ventral forearm, approximately 2 inches proximal to the wrist crease, between the tendons of the flexor carpi radialis and palmaris longus muscles. *(See Figure.)* The P6 acupuncture point lies along the pericardium meridian, which starts lateral to the nipple and descends down the medial aspect of the arm, ending at the tip of the middle finger. This meridian contains nine acupuncture points that regulate circulatory, psychiatric, and gastrointestinal function.

Mayer recently reviewed the literature regarding acupuncture as an antiemetic.[3] Previous reviews were published by Vickers[4] and Parfitt.[5] This article summarizes select studies that examined the antiemetic effects of acupuncture or acupressure to the P6 point in cancer chemotherapy, morning sickness during pregnancy, and postoperative nausea and vomiting.

Use in Patients Undergoing Cancer Chemotherapy

Much of the research in this area has been published in the European literature. In one study, Dundee and colleagues recruited 105 patients undergoing chemotherapy in either an inpatient or outpatient setting for breast cancer, testicular cancer, or lymphoma.[6] Before receiving chemotherapy, electroacupuncture was administered to the P6 point and compared with a control ("sham") point, located near the elbow, outside any acupuncture meridian. Treatments lasted five minutes. In a crossover design, the P6 point was shown to be an effective antiemetic for a period of about eight hours. Although statistical significance was not calculated by the authors, the effects appear to favor acupuncture.

A subsequent, smaller study of 20 patients showed that the duration of antiemesis could be extended to 24 hours by applying acupressure to the P6 point every two hours after acupuncture.[7]

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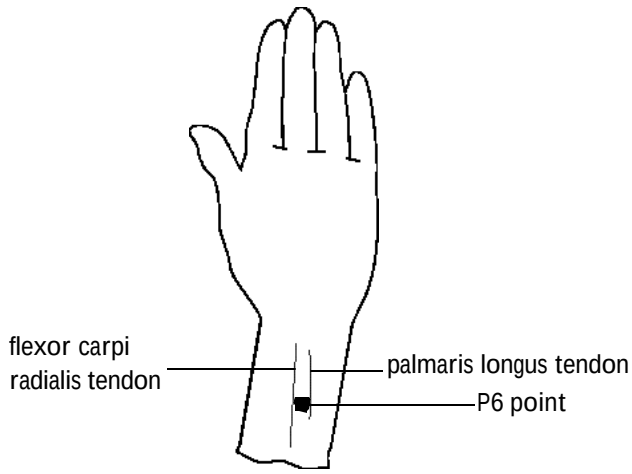
Figure

The Pericardium 6 (P6) point



Use in Morning Sickness During Pregnancy

Nausea and vomiting associated with morning sickness is troublesome to some pregnant women. Because of concerns about teratogenicity, women may be reluctant to use medications for their symptoms and have turned to acupressure and acupuncture for relief.

The use of complementary therapies in pregnancy recently has been well-reviewed elsewhere.[8] There are many studies of acupuncture and acupressure for morning sickness. Because some practitioners prefer not to perform acupuncture during the first trimester of pregnancy, acupressure frequently is used.

De Aloysio and Penacchioni conducted a study in which 60 pregnant women were randomized to either acupressure using an elastic wristband with a stud positioned over the P6 point or placebo (a band without a stud that exerted a negligible amount of pressure over the point).[9] Subgroups included patients who received unilateral vs. bilateral treatment or placebo. Patients were prospectively followed and evaluated with respect to their symptoms of nausea and vomiting. Although a placebo effect (of approximately 30%) was observed in patients receiving placebo acupressure, about 66% of patients who received true acupressure reported improvements in their symptoms. Therefore, acupressure at the P6 point resulted in an antiemetic effect that was approximately twice that of placebo-treated patients.

Another group studied 90 pregnant women receiving either acupressure at P6 or sham acupressure at an inert point for 10 minutes four times daily for seven days. The results showed that while nausea scores improved with acupressure, the incidence of vomiting was unaffected.[10]

Use for Perioperative Nausea and Vomiting

Acupuncture has been employed in the treatment of perioperative nausea and vomiting. Several studies have been conducted and reviewed by Parfitt.[5] The studies were heterogeneous in design, although the larger and more rigorously designed trials suggest a favorable effect of acupuncture as an antiemetic during the postoperative period. Even the better-designed studies vary with respect to the patients enrolled, type of surgery, timing of acupuncture, and duration of follow-up. Most studies administered acupuncture within two hours of surgery and followed patients for 6-48 hours after surgery. Some of the studies in which no effect was observed administered acupuncture while the patient was sedated with general anesthesia, leading several investigators to question the validity of the results.

Limitations of Research in this Area

The challenge of performing research studies of acupuncture is in blinding. Many studies have used "sham" or inert areas as controls, but there is debate as to whether this is appropriate. To address this critical issue of blinding, instruments such as a "blinded acupuncture needle" are in development, in which the acupuncturist feels as if the needle is penetrating the skin and the patient feels a sensation whether the needle is inserted or not. Use of such devices will enable more rigorous studies that also will allow for blinding of the acupuncturist, which to date, has remained a difficult task.

When considering the literature about antiemesis, it is important to remember that the stimuli that provoke nausea and vomiting are complex and that there may be a placebo effect. For example, data for use of acupuncture/acupressure for chemotherapy-induced nausea need to be considered in light of the fact that such patients may have "anticipatory" symptoms that are thought to result from classical behavioral conditioning and that placebo effects may exist. Nonetheless, it seems that acupuncture may be helpful given the effectiveness of the P6 point over a sham point.

Adverse Effects

In general, acupuncture is safe when performed by a trained professional. As with any needle inserted below the skin, there are risks *(see Table)*. Most adverse effects are benign.[11] Pneumothoraces and cardiac tamponade have been reported in the literature, but these are rare events. The risk of infection (e.g., viral hepatitis) has been reduced by the use of sterile, disposable needles and avoidance of needling in areas of overlying skin disease.

Table

Incidence of adverse effects of acupuncture

Adverse Effect	Prevalence
Needle pain	1-45%
Tiredness	2-41%
Bleeding	0.03-38%
Feeling faint/syncope	0-0.3%
Relaxation	~ 86%
Pneumothorax	rare
Cardiac tamponade	rare

Adapted from: Ernst E, White AR. Prospective studies on the safety of acupuncture: A systematic review. *Am J Med* 2001;110:481-485.

In general, patients with implanted cardiac pacemakers should avoid electroacupuncture, as should patients with bleeding diatheses. Acupuncture points that have been shown to affect uterine contraction (such as Spleen 6 and Large Intestine 1-4) should be avoided during pregnancy.[12]

Accreditation and Questions for the Acupuncturist

Patients considering the use of acupuncture should be aware that there is an educational and licensing procedure that is required in most states. Licensure is contingent upon completing coursework and passing a certification examination. Individuals who are interested in receiving acupuncture should seek a licensed practitioner. Patients should inquire about the details of the treatment plan, the anticipated outcome, the duration of treatment (generally 6-8 sessions), and the cost (usually $40-$60/session).

For additional information about physician acupuncturists, patients may contact the American Academy of Medical Acupuncture (http://www.medicalacupuncture.org). For non-physician acupuncturists, patients can contact the American Association of Oriental Medicine (http://www.aaom.org).

Conclusion

The available evidence suggests that acupuncture or acupressure may be useful as an antiemetic in the morning sickness of pregnancy and in cancer chemotherapy. It also may have a role in the management of postoperative nausea and vomiting. Some, but probably not all, of its benefit is from placebo effect. To more specifically ascertain the effects of acupuncture and acupressure, additional research will need to employ techniques that allow for double blinding. In addition, although animal studies have suggested that acupuncture may increase gastric motility and reduce acid secretion, the mechanism by which acupuncture may work in humans is unclear and deserves further study.

Recommendation

Acupuncture may be an option for patients who have ongoing needs for antiemetic treatment, but either have not responded to conventional pharmacological therapy or should avoid or want to avoid pharmacological therapy. When performed by a trained professional, acupuncture generally is safe. ❖

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Coenzyme Q_{10} to Enhance Aerobic Exercise

By Dónal P. O'Mathúna, PhD

COENZYME Q_{10} (ALSO CALLED CoQ_{10}, UBIQUINONE, OR ubidecarenone) is a lipid that is readily available in meat and seafood. It has some similarities to vitamins, especially vitamins E and K, but is not classified as such because it is produced in the human body. Dietary supplementation most commonly is recommended for adjuvant treatment of congestive heart failure, not as first-line therapy.[1] Studies have found that cardiac patients taking CoQ_{10} have improved ejection fraction, exercise tolerance, cardiac output, and stroke volume. Evidence that CoQ_{10} benefits patients with angina or hypertension is less conclusive to date.[1] The exercise-related results quickly caught the attention of athletes. Although the research does not support its ergogenic effectiveness, athletes continue to use CoQ_{10} in the hope that it will improve their aerobic performances.

Biochemistry

CoQ_{10} is a member of the coenzyme Q group of compounds with similar structures and functions. All contain a ring, called the "head," and a long chain, the "tail," which is made up of repeating five-carbon units called isoprenoid units *(see Figure)*.[2] The parentheses enclose one isoprenoid unit, with the subscript indicating the number of units in the particular compound. Human coenzyme Q contains 10 isoprenoid units, hence the name CoQ_{10}. The bacterial form is CoQ_5 and the rodent form is CoQ_9.

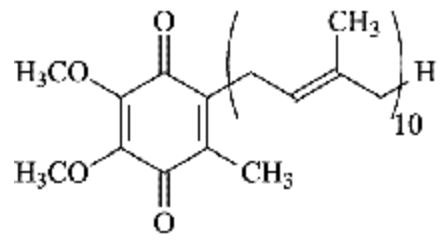
CoQ_{10} is highly lipophilic and lodges within the lipid layers of cell membranes. It is found in the inner membranes of mitochondria, the organelles regarded as the "power houses" of all cells. CoQ_{10} also is found in other membranes where it functions as a membrane stabilizer and an antioxidant.

Pharmacology

CoQ_{10} plays a vital role in the electron transport chain (ETC) found in mitochondria. The primary source of energy in living organisms is adenosine triphosphate (ATP). During exercise lasting longer than 30 seconds, ATP must be continuously regenerated via metabolism of carbohydrates, lipids, or proteins. All of these produce high-energy electrons that are funneled through CoQ_{10} shortly before ATP itself is produced. Rare cases of CoQ_{10} deficiency have been reported, in which symptoms included progressive muscle weakness, seizures, and encephalopathy.[3] Treatment with CoQ_{10} reversed the muscle weakness, but not the encephalopathy.

Figure

Coenzyme Q_{10}



Mechanism of Action

The antioxidant properties of CoQ_{10} are believed to underlie the beneficial effects found in cardiac patients. Exercise can produce free radicals, which are oxidants that may play a role in exercise-induced muscle soreness and damage.[4] Therefore, the antioxidant properties of CoQ_{10} may benefit athletes, although this mechanism of action has not been well established.

The primary use of CoQ_{10} by some athletes is based upon its essential role in ATP production. Normal CoQ_{10} levels do not saturate the ETC, and supplementation increases plasma CoQ_{10} levels, leading to speculation that supplementation could increase ATP production and aerobic exercise performance.[5] However, CoQ_{10} is only one of several compounds involved in the ETC; increased serum CoQ_{10} levels might not necessarily lead to increased mitochondrial levels or performance enhancement.

Clinical Studies

Several books were published on CoQ_{10} between the 1970s and early 1990s. A review of these found seven studies, mostly supportive of an ergogenic effect for CoQ_{10}.[5] However, these studies have been critiqued because they were not published in peer-reviewed journals,[6] and all had at least one serious methodological failing, including no statistical validation, no control group, no placebo, or no randomization.[7]

A search of PubMed and International Pharmaceutical Abstracts (using "coenzyme Q," "CoQ_{10}," and "ubiquinone") produced 12 controlled trials of the ergogenic effects of CoQ_{10} in humans. Nine of these studies used CoQ_{10} alone *(summarized in Table 1)*; three used CoQ_{10} in combination with other supplements *(summarized in Table 2)*.

The nine studies supplementing with CoQ_{10} alone involved triathletes, cyclists, cross-country skiers, and

Table 1

Summary of results of trials using CoQ_{10} alone

Study	Subjects	Blinding	Dose	Duration	Significant Results	Non-Significant Results
Zuliani et al[8]	12 untrained adults	N/A	100 mg/d	1 month	Reduced free fatty acids ($P < 0.05$)	Five metabolic tests
Roberts[9]	24 healthy college students	Double-blind	100 mg/d	28 days	N/A	VO_{2max} and two other tests within daily variation
Braun et al[10]	10 elite cyclists	N/A	100 mg/d	8 weeks	N/A	Time to exhaustion and three metabolic tests
Porter et al[11]	15 middle-aged men	Double-blind	150 mg/d	2 months	Subjective measure of vigor	VO_{2max}, lactate threshold
Laaksonen et al[12]	19 trained adults	Double-blind, crossover	120 mg/d	6 weeks	Time to exhaustion increased with placebo ($P = 0.0003$)	VO_{2max}
Malm et al[13]	18 well-trained adults	Double-blind	120 mg/d	22 days	Aerobic cycling test and total work improved with placebo ($P < 0.001$)	VO_{2max} and five other tests
Ylikoski et al[14]	25 elite cross-country skiers	Double-blind, crossover	90 mg/d	6 weeks	VO_{2max} ($P = 0.02$), anaerobic threshold ($P = 0.0003$), aerobic threshold ($P = 0.0001$)	Lactic acid clearance
Weston et al[15]	18 cyclists, triathletes	Double-blind	1 mg/kg/d	28 days	N/A	VO_{2max} and eight other tests
Bonetti et al[7]	28 cyclists	Single-blind	100 mg/d	8 weeks	N/A	VO_{2max}, seven other respiratory tests, and five metabolic tests

untrained adults.[7-15] Doses ranged from 90 to 150 mg/d. All of the studies used small numbers of subjects, lasted 1-2 months, and measured a wide range of outcomes.

Of the studies published in peer-reviewed journals, seven measured VO_{2max} (the amount of oxygen consumed while exercising, which is a proxy for the energy-generating capability of mitochondria). Of these, six found no significant differences between those taking CoQ_{10} and the subjects taking placebo. The one study in which the VO_{2max} improved significantly ($P = 0.02$) also found significant improvements in anaerobic threshold ($P = 0.0003$) and aerobic threshold ($P = 0.0001$).[14]

In contrast, two studies found that those receiving placebo had significant improvements compared to those receiving CoQ_{10}. In one, trained adults in the placebo group had significantly increased time to exhaustion ($P = 0.0003$), although the VO_{2max} did not differ between the groups.[12] In the second, untrained adults did significantly better on an aerobic cycling test and in total work output in the placebo group compared to those taking CoQ_{10} ($P < 0.001$).[13]

Three studies used CoQ_{10} in combination with other vitamins and supplements *(see Table 2)*. Vitamins C and E were used for their antioxidant properties.[16,17] The CoQ_{10}, vitamin E, inosine, and cytochrome c combination was called coenzyme athletic performance system, but it was not stated if this was a proprietary product.[18] These studies found no statistically significant benefits from the CoQ_{10} combination supplements.

All clinical trials with CoQ_{10} found significantly increased plasma levels of CoQ_{10} after supplementation. However, any ergogenic effect would require increased CoQ_{10} levels in muscle cells and their mitochondria. To investigate whether oral CoQ_{10} supplements increase these levels, 17 well-trained men volunteered for a double-blind, randomized trial.[19] Each took either CoQ_{10} (120 mg/d) or placebo. After 20 days, plasma CoQ_{10} levels were significantly higher in those taking CoQ_{10} ($P < 0.05$) and were unchanged in the placebo group. Muscle biopsies revealed no significant changes in the CoQ_{10} levels in skeletal muscle or the mitochondrial fraction of the muscle. No correlation was found between the plasma and muscle CoQ_{10} levels. The rate of ATP synthe-sis in isolated mitochondria was measured in four subjects, and also was found to be unchanged with supplementation.

Table 2

Summary of results of trials with CoQ_{10} combined with other compounds

Study	Subjects	Blinding	CoQ_{10} Dose	Other Compounds	Duration	Non-Significant Results
Snider et al[18]	11 triathletes	Double-blind, crossover	100 mg/d	500 mg cyto-chrome C, 100 mg inosine, 200 IU vitamin E	4 weeks	Time to exhaustion and three metabolic tests
Kaikkonen et al[16]	37 marathoners	Double-blind	90 mg/d	13.5 mg vitamin E	3 weeks	Lipid peroxidation and muscle damage
Nielsen et al[17]	7 triathletes	Double-blind, crossover	100 mg/d	600 mg vitamin C and 270 mg vitamin E	6 weeks	VO_{2max}, fatigue test, and three metabolic tests

Adverse Effects

Adverse effects have not been reported in clinical trials, although mild GI disturbances have been reported in less than 1% of patients.[20] Although CoQ_{10} is an antioxidant, there are concerns it may act as a pro-oxidant under acidic conditions. To evaluate this, plasma creatine kinase (CK) activity was measured in 15 trained men after exercising.[21] The men were randomly assigned to receive CoQ_{10} 120 mg/d or placebo for 15 days. On days 11 and 15, CK levels were significantly higher in those taking CoQ_{10}, but unchanged in the placebo group. CK levels returned to normal five days after CoQ_{10} supplementation ceased. The authors concluded "that under conditions with high proton concentration (e.g., high-intensity exercise) and Q_{10} supplementation, there is increased cell damage."

Drug Interactions

There are reports that CoQ_{10} can decrease the effectiveness of warfarin.[2] CoQ_{10} is chemically similar to vitamin K and may have similar pro-coagulant activity.[20]

The HMG CoA reductase inhibitors ("statins") inhibit cholesterol and CoQ_{10} synthesis, leading to lower CoQ_{10} levels. Whether this is clinically significant is unknown. There is concern that CoQ_{10} supplements may interfere with medications for hypertension or diabetes, but these effects are not believed to be widespread.[20]

Formulation

CoQ_{10} supplements are formulated as oil-based capsules, powder-filled capsules, tablets, and soft-gel capsules containing microemulsions.[2] The latter are claimed to have better bioavailability than other formulations. The most common doses are 70-150 mg/d CoQ_{10} for several weeks.

Because CoQ_{10} is a lipid, its absorption is poor, highly variable, and strongly dependent on the contents of the stomach. When taken on an empty stomach, very little is absorbed. More than 60% of an oral dose of CoQ_{10} is excreted unchanged in the feces.[19] All formulations are best taken with food, especially fat-rich foods. Once absorbed into the blood, CoQ_{10} enters lipid membranes throughout the body, requiring about three weeks of supplementation before serum concentrations maximize.[2]

Conclusion

A general picture of lack of efficacy of CoQ_{10} as an exercise-enhancing agent is becoming apparent. This contrasts with the exercise benefits found in some cardiac patients. Nonetheless, the bulk of the research shows no ergogenic benefit for healthy individuals and athletes. Two studies found that CoQ_{10} interfered with performance. One study supports a theoretical concern about tissue damage resulting from a pro-oxidant effect when CoQ_{10} is found in an acidic environment, such as occurs in tissues after exercise.

Recommendation

Given the lack of evidence that CoQ_{10} supplements are effective ergogenic aids, use by athletes should be discouraged. Although serious adverse effects have not been reported, the finding that CoQ_{10} may have a pro-oxidant effect raises concern about its use. Since exercise itself can be a source of oxidative stress, the long-term use of any supplement that might further increase oxidative damage should be discouraged. ❖

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The Feldenkrais Method of Bodywork

By Alan D. Forker, MD, FACC

IN THE REPORT OF THE NATIONAL INSTITUTES OF HEALTH (NIH) entitled, "Alternative Medicine; Expanding Medical Horizons," three movement and physical touch therapies were discussed under the topic of Postural Re-Education Therapies: Feldenkrais, Alexander, and Trager. Now they more commonly are described under the overall title of "bodywork."[1] This review will focus on the Feldenkrais method (of bodywork); the Alexander technique and Trager approach will be described briefly. All three are best utilized in the prevention and treatment of musculoskeletal disorders; but they also have been used in headaches, chronic lung disease, Ménière's disease, and mental depression.[2]

Conceptual Foundation

The fundamental concept of each therapy is to become more self-aware and learn by experiencing and doing. From the perspective of this inexperienced observer, there appears to be much overlap between the three. When Moshe Feldenkrais, DSc, was asked to compare his technique with physical therapy, chiropractic, yoga, Shiatsu acupressure, Rolfing, Alexander technique, spiritual practices, and psychotherapies, he replied, "My work is more fundamental."[3]

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Feldenkrais described the skeleton and muscles of the human body as three upside-down pyramids balanced on each other.[4] Specifically, the top pyramid would be the head on top of the cervical vertebrae; the second pyramid would be shoulders above the lumbar

Figure

Awareness through movement exercise

vertebrae; and the third or bottom pyramid would be the pelvis on top of the legs. The center of gravity is high and frequently creates an unstable balance of extensors (or antigravity muscles) and flexors. To achieve and maintain erect posture, the sixth or the kinesthetic sense must be "re-educated and reset."

Procedure

Feldenkrais used two forms of teaching.[3-7] Awareness through movement (ATM) is taught in a group setting with verbal instruction. A student lies flat on the floor or sits in a chair, and slowly and cautiously learns to sense minor degrees of movement and what feels best *(see Figure)*. Exercises involving breathing, bending, and twisting—first in one direction and then in the opposite direction—are employed. Which feels more natural? Is there movement in the entire spine? Using ATM, a student learns to sense, feel, and see small differences in movement. Hundreds of exercises are utilized.

Functional integration (FI) is taught individually using gentle touch to guide the learner through different movements, usually on a table. The FI teacher develops a lesson tailored to the unique configuration of the student, and guides the student with his/her hands by tactile, kinesthetic communication, not massage or chiropractic manipulation.

Clinical Research Evidence

Very few high-quality, published clinical research data were found searching the Feldenkrais Guild, the Internet, PubMed, and the Cochrane Collaborative Database. No data were found comparing the Feldenkrais, Alexander, and Trager bodywork techniques.

Minimal well-done clinical trial data can be presented. Most Feldenkrais data are anecdotal and consist largely of case reports. Julius Erving, Whoopi Goldberg, and YoYo Ma have tried it. A typical report, like the one by Lake, presents pre- and post-postural instruction photos of six cases and minimal objective data on physical examination, with no attempt to quantify disability.[8]

Johnson et al conducted a randomized controlled trial on Feldenkrais and multiple sclerosis.[9] Twenty patients (15 female, 80% white) with a moderate disability score received 45 minutes of instruction weekly and were followed for 16 weeks. The sham or control groups received light touch with soft music (i.e., primarily relaxation therapy). No significant differences in any of the performance measures and symptoms occurred, but positive psychological benefits were noted.

Guttman et al published a trial of Feldenkrais vs. conventional exercise therapy in elderly residents of two retirement homes in British Columbia.[10] One retirement home utilized Feldenkrais (19 treated, 19 control) and the second retirement center utilized conventional exercise (13 exercise, 16 control) for a total of 67 enrollees. Individuals who completed at least half of the sessions at six weeks were retested for rotation flexibility and balance. No significant differences in any major measurement were found. Perceived positive benefits included improved overall health, better sleep, and more energy. Limitations include the small sample size, the very short study period, and measurements that may not have been sensitive enough to show any change. Finally, what was most important: Feldenkrais, exercise, or the favorable effect of interest and attention shown to the participants?

James et al described a trial of Feldenkrais vs. relaxation therapy on hamstring length in 48 normal undergraduate physiotherapy students in Australia.[11] Feldenkrais lessons (four total) involved listening to one of four different audio cassette tapes; no description of the method or instruction was provided. No significant difference was shown at two weeks.

Laumer et al described the use of Feldenkrais in eating disorders.[12] Fifteen patients were randomized to a nine-hour course utilizing Feldenkrais vs. 15 controls. The outcome measure was six psychological scales; with short-term follow-up, no significant differences were found. The Feldenkrais group did have increased self-confidence and contentment, and were more spontaneous and experienced fewer feelings of hopelessness.

In the 1992 NIH workshop, three studies on Feldenkrais were mentioned: One was an abstract describing one patient;[13] another was an unpublished master's thesis describing four patients with rheumatoid arthritis;[14] and one utilized a small number of normal college students.[15] None of the outcomes were long-term. Two recent textbooks both conclude that only anecdotal information is available.[16,17]

The best overall review of complementary and alternative therapies for multiple sclerosis included only one article on Feldenkrais.[18] The author noted a key difference between massage and Feldenkrais: Feldenkrais methods encourage a life-long discovery process through which patients learn why they have pain and

distress while they learn how to become more aware and promote self-healing.

Moshe Feldenkrais: The Man's Unique Story

Moshe Feldenkrais was born in the Ukraine in 1904 and immigrated to Palestine at age 13. While playing soccer as a young man, he had a severe injury to his left knee, tearing ligaments and cartilage. In 1928, he moved to Paris to study physics, mathematics, and mechanical and electrical engineering; he obtained a doctorate of science at the Sorbonne. He was invited to work with Frederic Joliet-Curie, who was awarded the 1935 Nobel Prize in chemistry; Moshe was his principal assistant at this time.[3]

A bus accident aggravated his old knee injury. Moshe consulted English surgeons who told him that surgery had a 50% chance of success. He began searching for a better answer, studying anatomy, physiology, neurophysiology, exercise and movement therapy, psychotherapy, spiritual practices, Yoga, hypnosis, and acupuncture. He applied what he learned to his own knee and never had knee surgery.

In 1949, he returned to Israel as the First Director of the electronics department, Israel Defense Force. He was introduced to Prime Minister David Ben-Gurion, who had chronic back pain and breathing difficulties. Working with Feldenkrais, Ben-Gurion improved dramatically; in fact, at age 76 (1962), a photo, which was published in *Parade Magazine*, was taken while he stood on his head on a beach in Tel Aviv. Feldenkrais and his technique became well known in Israel.

To locate a practitioner and or join a training program, contact the Feldenkrais Guild of North America: (800) 775-2118 or http://feldenkrais.com.

The Alexander Technique

The Alexander Technique is named after a Shakespearian actor, Frederick Matthias Alexander (1869-1955), who concluded that poor posture was responsible for his recurrent episodes of voice loss. The technique aims for proper alignment of the head, neck, and spine so the body can move more efficiently. The technique still is widely used by actors, musicians, and athletes to improve performance. The Alexander Technique often is taught one-on-one; a typical session lasts 30-60 minutes and costs $40-$90. The American Society of the Alexander Technique can be reached at (800) 473-0620 or http://www.alexandertech.org.[2]

The Trager Approach

A Hawaiian physician (and former boxer, dancer, trainer, and gymnast) named Milton Trager, MD (1909-1997) developed the Trager Approach. The technique includes compressions, elongations, light bounces, and rocking motions. A typical session lasts 60-90 minutes and costs $50-$120. The Trager Institute can be reached at (216) 897-9383 or http://www.trager.com.[2]

Conclusion

Feldenkrais appears to produce relaxation, a sense of well-being, and attention to better posture. Reputable clinics, such as Scripps in La Jolla, CA, already offer it with physical therapy; many physical therapists use it in their practices.[19] With a lack of evidence-based research, it is difficult to make definite conclusions regarding the scientific merit or cost effectiveness of Feldenkrais.

Recommendation

For willing, interested patients with low back pain or other forms of muscular soreness and pain; movement disorders associated with cerebral palsy, Parkinsonism, or multiple sclerosis; or post-stroke disability, consider the Feldenkrais method and massage. Similarly, for entertainers and competitive athletes, the Feldenkrais method is an approach that may relieve stress and improve performance. What I most strongly recommend is long-term clinical trials that include a greater number of patients, utilize better outcome measures, and minimize dependent variables. ❖

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CME Questions

1. Acupuncture's antiemetic mechanism of action is:
a. not entirely clear.
b. via enhanced sympathetic tone.
c. through alterations in lower esophageal sphincter tone.
d. via competitive inhibition of acetylcholine receptors.

2. Individuals who are planning to receive acupuncture should:
a. verify the training and licensure of the practitioner.
b. understand the treatment plan and anticipated results.
c. review the costs of the treatment in advance.
d. All of the above

3. For which condition is CoQ_{10} supplementation best supported?
a. Athletic performance enhancement
b. Angina
c. Congestive heart failure
d. Hypertension

4. Patients taking CoQ_{10} should be alerted to possible interference with the pharmacological effects of:
a. antidiabetic drugs.
b. warfarin.
c. vitamin K.
d. All of the above

5. Endogenous levels of CoQ_{10} are lower in patients who are taking statins.
a. True
b. False

6. "Bodywork" refers to which of the following therapies?
a. Feldenkrais
b. Alexander
c. Trager
d. All of the above

7. The goal of the Feldenkrais method is to rebalance muscles with minimal muscle tone to maintain the erect posture.
a. True
b. False

With Comments from John La Puma, MD, FACP

Informed Consent and CAM

Source: Ernst E, et al. Informed consent in complementary and alternative medicine *Arch Intern Med* 2001:161:2288-2292.

THE INCREASING POPULARITY OF COMplementary and alternative medicine (CAM) poses serious challenges for the physician, not the least being the issue of informed consent. Informed consent should include adequate information about the risks and benefits of all treatment options. The information about potential risks, including frequent, nonserious adverse affects and infrequent, serious complications, is crucial for patients to know. Failure to disclose the availability, benefits, and risks of CAM treatments could give rise to malpractice claims. The ethical rules physicians follow in conventional care usually can be applied to treatment with CAM. The focus must be on expressing risks clearly, documenting informed consent adequately, and keeping up-to-date with the emerging evidence on CAM.

As CAM becomes accepted by and integrated into mainstream health care, it will pose a number of serious problems for the physician. One formidable challenge is to formulate and adhere to ethical standards for CAM that compare favorably with those of conventional medicine. Ethical standards, in turn, are a precondition for physicians and other health care providers to assess whether and when to refer patients to CAM practitioners. This review discusses one particular ethical issue, informed consent, which clinicians are called on to provide on a daily basis. Moreover, there are prominent legal implications.

COMMENT

Informed consent is comprised of three elements: adequate information, reasonable understanding, and noncoercion. It is a basic principle in both law and medicine, and most physicians respect it deeply. Whether one should obtain informed consent for CAM is a thorny, multifaceted problem that already has attracted book-length manuscripts and formal analysis.

The clinical analysis is simpler: Patients are, of their own volition, seeking out non-medical practitioners and practices that are outside the mainstream of medical practice, and often paying for it out of pocket. The medical principle of informed consent often is not in play, as a health care entity is uninvolved. Other principles govern this interaction, e.g., the integrity of business and the "caveat emptor" of the marketplace.

When mainstream physicians offer CAM therapy as therapy, however, they incur the ethical obligations associated with prescription pharmaceuticals, surgical intervention, and other, more standard treatments. Unfortunately, a great deal of the information about many CAM therapies is either unavailable to prescribing physicians or of unacceptable quality. The patient or her surrogate may reasonably understand what information is provided, and may not feel forced to accept the physician's recommendation. But how much information is adequate, especially about risks and benefits, often is where the rub arises.

The authors present three legal cases concerning CAM and clinical practice. In one, hair analysis was used for cancer diagnosis; in another, nutritional therapies were used in breast cancer treatment after a permission/waiver was signed; and in a third, a patient sued because a physician did not disclose EDTA chelation as an alternative treatment for carotid endarterectomy (the physician was acquitted). Although two of these cases reached the appellate level, the authors appropriately note that case law is sparse and underdeveloped.

The authors attempt to fashion an approach to informed consent in CAM, based on the cases above, and their knowledge of CAM and the legal process. They favor disclosure of available CAM therapies that patients may want. They note that "physicians and patients often disagree on what kind and what level of evidence make a therapy demonstrably safe and effective enough for the physician to tolerate or recommend the therapy." The latter point is highly contentious: It is one thing to accommodate a patient's use of CAM; it is another thing altogether to prescribe it.

Recommendation

Physicians should attempt to apply ordinary principles of informed consent when recommending a CAM therapy, and should attempt to recommend CAM therapies that are strongly evidence-based. I know of no affirmative obligation to disclose CAM therapies that patients may want but for which the physician cannot reasonably be expected to know the evidence. ❖

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