CHAPTER 44

Complementary and Alternative Therapies

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- Complementary and alternative therapies are popular and widely used among patients with rheumatic and musculoskeletal diseases.
- Marketing and word of mouth, ready availability, and interest in "natural" treatments contribute to their popularity.
- Scientific basis and clinical trails of most therapies is limited or lacking.

More and more people are employing complementary and alternative medicine (CAM) to treat their illnesses. A survey of English-speaking patients found that 42.1% used at least 1 of 16 specific CAM therapies during a 12-month period (1). In this study population, visits to CAM practitioners exceeded total visits to primary care physicians, and more than 50% of the patients had a musculoskeletal disease (arthritis, back, or neck pain). Total out-of-pocket expenditures for CAM treatments were estimated to be $27 billion, similar to out-of-pocket expenditures for all US physician services. The study found that patients were most likely to use CAM therapies in conjunction with, rather than in place of, conventional therapies.

Most rheumatic conditions are characterized by chronic pain, an unpredictable disease course, and often without satisfactory response to therapy. As a consequence, patients with rheumatic diseases, in particular osteoarthritis (OA) and fibromyalgia, often seek out CAM therapies in addition to the conventional treatment their doctors recommend (2).

Patients are often reluctant to discuss CAM therapies with their physicians. To protect patients from dangerous drug interactions and treatment modalities known to be harmful, use of CAM therapies must be elicited as a part of the comprehensive history and physical examination (3). Between 38.5% and 55% of patients do not disclose use of CAM therapies to their physicians (1,2) simply because their physicians fail to ask. The fear of physician disapproval of CAM therapies accounts for only 15% of patient nondisclosure (2). As the medical community awaits more rigorous assessment of CAM therapies, physicians should be motivated by existing evidence (1–3) to ask patients about their use of CAM therapies.

MEDITATION, BIOFEEDBACK, AND STRESS REDUCTION

Meditation, biofeedback, and stress reduction are used widely for the treatment of pain, depression, and anxiety. These therapeutic modalities are especially popular with people who have fibromyalgia.

Meditation teaches the patient to develop concentration, calmness, and insight as a way of treating symptoms (4). A prospective, observational, case-control study found that people with fibromyalgia were more likely than control patients in a rheumatology practice ($p < 0.01$) to use CAM (5). People with fibromyalgia perceived spiritual practices (meditation, relaxation, self-help groups, prayer) as more beneficial than over-the-counter products, use of other health care practitioners, and dietary modifications. In an uncontrolled study of 225 patients with chronic pain enrolled in a meditation program, 60% showed continued improvement of pain at 4 years follow-up (4).

Biofeedback, with the assistance of electronic monitors, teaches people how to use their mind to affect body functions (e.g., circulation and pain sensation). In people with RA, biofeedback has been shown to decrease clinic visits, hospitalization days, and medical

costs (6). In a review of 23 people with Raynaud's phenomenon using biofeedback therapy, Yocum and colleagues (7) found that at 18 months, patients continued to be able to raise baseline finger temperatures and that the greatest temperature increase was observed in patients with connective tissue disorders, including lupus and scleroderma.

Relaxation techniques focus on the reduction of stress by using such tactics as breathing exercises to help provide relief. In a randomized, controlled trial of people with RA, relaxation techniques were shown to significantly reduce pain, disease activity, and anxiety (8).

PRAYER AND SPIRITUALITY

A majority of Americans believe in the healing power of prayer. Seven percent of patients surveyed by Eisenberg and colleagues (1) reported using some form of spiritual healing in conjunction with conventional therapies, and 35% reported using prayer to address health-related problems. Patients with chronic illnesses seek treatment that includes attention to the mind and spirit as well as the body.

A number of studies have shown an association between spiritual involvement and positive health outcomes. Distant healing is considered to be a conscious, dedicated act directed at benefiting another person's physical or emotional well-being at a distance. It includes prayer, therapeutic touch, Reiki, and LeShane healing. A systematic review of randomized trials of distant healing found that 13 of 23 studies (57%) that met inclusion criteria yielded statistically significant, positive treatment effects of distant healing (9). Nine of the 23 studies showed no effect and one showed a negative effect, making it difficult to draw definitive conclusions about efficacy, but also difficult to simply dismiss the power of distant healing.

EXERCISE

Strengthening, stretching, general conditioning exercises, and yoga have been shown to provide symptomatic relief for various forms of arthritis.. In older adults a regular exercise program was shown to result in a 32% reduction in functional decline (10). The lack of regular exercise almost doubled the odds of functional decline [adjusted odds ratio (OR) 1.5; 95% confidence interval (CI), 1.5–2.]. In a randomized, controlled trial, people with OA of the knee who were enrolled in a program of physical therapy combined with supervised and unsupervised exercise were found to have clinically and statistically significant improvement (11). The benefits attained in the treatment group continued to be apparent at 1 year, with fewer patients requiring knee surgery than did patients in the control group. In a separate study, patients with carpal tunnel syndrome experienced a statistically significant improvement in grip strength and pain reduction with a yoga program based on upper body postures; flexibility exercises; correct alignment of hands, wrists, arms, and shoulders; stretching; and increased awareness of optimal joint position (12).

ACUPUNCTURE

Based on the belief that there are patterns of energy flow (Qi) that are essential for health, acupuncture is a procedure that treats illness by correcting Qi imbalances. Solid, sterile metal needles are used to penetrate the skin and manually or electrically stimulate known flow patterns. Acupuncture frequently is used to treat pain and is considered a useful therapy for such conditions as OA, Raynaud's phenomenon, fibromyalgia, and low back pain (13). A meta-analysis of randomized, controlled trials of acupuncture for the treatment of back pain found that acupuncture was superior to other control interventions (14). A randomized, controlled trial of acupuncture in people with OA of the knee found statistically significant reductions of pain in patients treated with acupuncture (15). Chronic low back pain was effectively relieved by acupuncture in a meta-analysis of randomized, controlled trials (16).

MASSAGE

Massage is one of the CAM interventions used most frequently and is, in general, risk-free. Various massage techniques can be used (Table 44-1), and patients need

TABLE 44-1. MASSAGE AND BODYWORK.

Western massage
Swedish massage: full-body stroking and kneading of the superficial muscle layers, using oil or lotion
Deep tissue massage: strong pressure on deep muscles or tissue layers
Trigger point therapy: deep finger pressure on trigger points
Myofascial release: steady pressure to stretch fascia
Oriental bodywork and massage
Acupressure (i.e., Shiatsu): finger and hand pressure used at acupuncture points
Structural integration bodywork
Chiropractic adjustment: short-level, high velocity thrust directed specifically at a "manipulable lesion"
Osteopathic manipulation: thrust, muscle energy, counterstrain, articulation, and myofascial release directed at a specific lesion
Rolfing: release of muscles and tissue layers from surrounding fascia using deep pressure and fascia release techniques
Reflexology: stimulation of massage points in the feet, hands, and ears that correspond to organs and body parts
Crainiosacral therapy: gentle manipulation of the skull bones to balance the fluids in the craniosacral system

to be encouraged to discuss their medical conditions with the massage therapist. With this information, therapists can devise a plan for massage that will achieve the desired outcome and avoid negative experiences. For example, people at risk for fracture because of known osteoporosis or chronic corticosteroid use should avoid deep pressure. In a randomized, placebo-controlled trial comparing Swedish massage, transcutaneous electrical nerve stimulation (TENS), and sham TENS therapy in people with fibromyalgia, patients in the massage group showed decreases in insomnia, pain, fatigue, anxiety, and depression as well as decreased cortisol production (17).

HERBS, SUPPLEMENTS, AND VITAMINS

Herbal remedies are the fastest-growing form of CAM therapy in the United States. Viewed as "natural," and therefore safe, herbs actually are potent medications. Potential benefits of herbal therapy must be balanced against the possible harmful side effects from interactions with other prescription medications or the presence of illicit constituents or contaminants. Because most herbs used to relieve pain affect eicosanoid metabolism, the side effects may be similar to those of nonsteroidal anti-inflammatory drugs (NSAIDs). Many commonly used herbs and supplements affect the clotting system and preoperative assessments must include questions concerning herbal intake.

Neither herbal nor supplement preparations undergo strict production inspection or quality control under the 1994 Dietary Supplement Health Education Act. *Contaminants* such as lead and arsenic as well as NSAIDs and steroids have been found in herbal preparations. Supplement preparations may or may not contain specified amounts or even any of the advertised supplement. Besides presenting a patient safety issue, this variability also makes any studies of these supplements difficult to interpret.

The best-studied nutritional supplements to date have been glucosamine sulfate and chondroitin sulfate. The Glucosamine–Chondroitin Arthritis Intervention Trial (GAIT) measured the effects of glucosamine alone, chondroitin alone, a glucosamine–chondroitin combination, and celecoxib alone against placebo in 1583 people with either mild or moderate-to-severe pain from knee osteoarthritis (18). In moderate-to-severe pain, 79% who took the glucosamine–chondroitin combination reported pain relief compared to 54% in people who took placebo. Patients with mild pain responded similarly to the glucosamine–chondroitin combination and placebo (63% and 62%, respectively). Because neither of these supplements have significant side effects, most clinicians have accepted or even encourage their use in people with OA of the knee.

Evidence from studies in an animal model of inflammatory arthritis suggests a protective effect of polyphenols contained in green tea (*Camelia senensis*) (19). The equivalent of three to four daily cups of green tea prevented or ameliorated the development of arthritis. Methylsulfonyl methane (MSM) has been shown to reduce WOMAC pain scores and improve functional scores in patients with knee pain and osteoarthritis when compared to placebo (20).

In symptomatic patients with systemic lupus erythematosus (SLE), omega 3 fish oil supplements significantly reduced disease activity (measured with SLAM-R) compared to placebo (21).

Vitamins C and D have been hypothesized to benefit patients with OA. Low levels of vitamin D have been found in people with OA of the hip and knee (22). Hypovitaminosis D is an established risk factor for fractures in patients with OA. Low serum 25-hydroxy vitamin D [25(OH)D] levels, have been found to correlate with low bone mineral density (BMD) and the presence of primary knee OA (23). Greater intake of vitamin D has been found to be associated with a lower risk of developing RA [relative risk (RR) 0.66; 95% CI, 0.42–1.01; $p = 0.06$) in older women (55–69 years old) (24). Patients with higher levels of vitamin C intake appear to have a lower incidence of OA. Theoretically, antioxidant supplements could help to prevent the progression of OA of the knee (25).

DIET AND ARTHRITIS

Except for prevention and treatment of gout, there is no definitive scientific evidence that what an individual eats can cause or cure arthritis. However, an increasing amount of literature suggests that a change in diet may relieve some symptoms and even impact the progression of disease. For example, oleocanthal, a component of extra virgin olive oil can cause a dose-dependent inhibition of both cyclooxygenase (COX)-1 and COX-2, therefore inhibiting inflammation (26) and, in some studies, reduce the risk of developing RA (27). Unfortunately one would have to consume about a half liter of oil to obtain the effects of two ibuprofen tablets. The lack of consistency among findings limits the ability to make specific dietary recommendations for the prevention or treatment of arthritis. However, encouraging patients to modify their diets may result in beneficial weight loss as well as an overall improvement in health. A weight loss of as little as 5 kg may reduce the incidence of OA of the knees by 50% in women, particularly women who are more than 10% over their ideal body weight (28).

Red meat and certain vegetable oils (corn, sunflower, and safflower) contain omega 6 fatty acids, which are synthesized into arachidonic acid, the building blocks for prostaglandins and leukotrienes. Eliminating or reducing the amount of omega 6 while substituting omega 3 oils may help reduce pain and inflammation. Omega 3 fatty acids are eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), fatty acids that compete with omega 6 fatty acids to form arachidonic acid. In fact, diets high in omega 3 fatty acids appear to have a protective effect against rheumatoid arthritis onset (27). Good sources for omega 3 fatty acids are fresh cold-water fish, sardines in their own oil, flaxseed, green soybeans and tofu, and canola and olive oils. Patients also can take food supplements to get more omega 3 fatty acids.

MISCELLANEOUS THERAPIES

Wearing copper bracelets is believed to ease arthritis pain. In a placebo-controlled trial, Walker and Keats demonstrated that a significant number of patients assigned to wear copper bracelets experienced arthritis pain relief, compared with little relief reported by individuals assigned to wear bracelets that were painted to look like copper (29). These investigators also reported that the copper bracelets were lighter at the end of the study period and suggested that copper was absorbed by the skin. While the concept of absorbing copper through the skin is controversial, it is worthwhile to recommend that patients who are interested in trying this alternative therapy buy a bracelet that has not been treated to prevent tarnishing.

Static magnet therapy, as opposed to pulsed electromagnetic therapy (the use of pulsed electric current in combination with a permanent magnet, a medically accepted therapy) is believed to relieve pain by increasing circulation, suppressing inflammation, affecting C-fibers, and changing the polarization of cells. Two scientific trials (30,31) have suggested that static magnetic therapy may relieve arthritis symptoms. However, the short follow-up periods and the small sample sizes limit the results' applicability and emphasize the need for more studies.

Bee stings or injections are believed by some to reduce arthritis symptoms. Applied at painful areas or trigger points, the known anti-inflammatory chemicals in bee venom are thought to relieve inflammation. Animal studies have shown that bee venom reduces inflammation (32) and prevents rats from getting an induced form of arthritis (33). However, no human studies have been done, and it is felt that the risk of an anaphylactic reaction outweighs the unproven benefit of symptom relief.

AVAILABLE RESOURCES

Internet sites to help physicians assist their patients in making educated decisions about the use of CAM therapies can be found in Table 44-2 and Appendix IV.

TABLE 44-2. RESOURCES AVAILABLE ON THE INTERNET.

Alternative medicine
Altmednet.com: http://www.altmednet.com (many CAM links)
Arthritis Foundation: http://www.arthritis.org
Cochrane Collaboration: http://www.cochrane.org/index.htm (systematic review)
National Center for Complementary and Alternative Medicine: http://nccam.nih.gov (affiliated with NIH, conducts and supports research as well as providing information about CAM)

Healing systems
Ayruvedic medicine: http://ayurvedahc.com
Chinese medicine: http://acupuncture.com
Naturopathic medicine: The American Association of Naturopathic Physicians http://www.naturopathic.org
Homeopathic medicine: National Center for Homeopathy: http://www.homeopathic.org
Chiropractic medicine: American Chiropractic Association: http://www.amerchiro.org
Osteopathic medicine: American Osteopathic Association: http://www.aoa-net.org

Meditation, biofeedback, stress reduction
The Mind–Body Medical Institute: http://www.mindbody.harvard.edu (information and referrals)
Insight Meditation Society: http://www.dharma.org (information and links)

Prayer and spirituality
National Institute for Healthcare Research: http://www.nihr.org

Yoga
The American Yoga Association: http://www.americanyogaassociation.org/

Massage
The National Certification Board for Therapeutic Massage and Bodywork: http://www.ncbtmb.com (referral list)
The American Massage Therapy Association: http://www.amtamassage.org (information about massage as well as locator service for therapists)

Herbs, supplements, vitamins
US Food and Drug Administration: http://www.fda.gov (access to MEDWATCH as well as warnings on herbal products)
American Botanical Council: http://www.herbs.org (factual information about herbs)
HerbMed: http://www.amfoundation.org/ (herbal database)
NIH Office of Dietary Supplements: http://dietary-supplements.info.nih.gov
American Dietetic Association: http://www.eatright.org (referrals to registered dietitians)
American Herbalists Guild: http://www.americanherbalistsguild.com (referrals to herbal practitioners)

ABBREVIATIONS: CMA, complementary and alternative medicine; NIH, National Institutes of Health.

REFERENCES

1. Eisenberg DM, Davis RB, Ettner SL, et al. Trends in alternative medicine use in the United States. 1990–1997. JAMA 1998;280:1569–1575.
2. Rao JK, MiboIiak K, Kroenke K, Bradley J, Tierney WM, Weinberger M. Use of complementary therapies for arthritis among patients of rheumatologists. Ann Intern Med 1999:131:409–416.
3. Sugarman J, Burk L. Physicians' ethical obligations regarding alternative medicine. JAMA 1998;280:1623–1625.
4. Kabat-Zinn J, Lipworth L, Burney R, Sellers W. Four year follow-up of a meditation-based program for the self-regulation of chronic pain: treatment outcomes and compliance. Clin J Pain 1986;2:159–171.
5. Pioro-Boisset M, Esdaile JM, Fitzcharles MA. Alternative medicine use in fibromyalgia syndrome. Arthritis Care Res 1996;9:13–17.
6. Young LD, Bradley LA, Tllmer RA. Decreases in health care resource utilization in patients with rheumatoid arthritis following a cognitive behavioral intervention. Biofeedback Self Regul 1995;259–268.
7. Yocum DE, Hodes R, Sundstrom WK, Cleeland CS. Use of biofeedback training in treatment of Raynaud's disease and phenomenon. Rheumatology 1985;12:90–93.
8. Bradley LA, Young LD, Anderson KO, et al. Effects of psychological therapy on pain behavior of rheumatoid arthritis patients. Treatment outcome and six-month followup. Arthritis Rheum 1987;30:1105–1114.
9. Astin LA, Harkness E, Ernst E. The efficacy of distant healing: a systematic review of randomised trials. Ann Intern Med 2000;132:903–910.
10. Dunlop DD, Selmanik P, Song J, et al. Risk factors for functional decline in older adults with arthritis. Arthritis Rheum 2005;52:1274–1282.
11. Deyle D, Henderson NE, Matekel RL, Ryder MG, Garber MB, Allison SC. Effectiveness of manual physical therapy and exercise in osteoarthritis of the knee. Ann Intern Med 2000;132:173–181.
12. Garfinkel MS, Singhal A, Katz WA, Allan DA, Reshetar R, Schumacher HR. Yoga-based intervention of carpal tunnel syndrome: a randomized trial. JAMA 1998;280: 1601–1603.
13. NIH Consensus Development Panel on Acupuncture. Acupuncture. JAMA 1998;280:1518–1524.
14. Ernst E, White AR. Acupuncture for back pain: a meta-analysis of randomized controlled trials. Arch Intern Med 1998;158:2235–2241.
15. Berman BM, Lao L, Langenberg P, Lee WL, Gilpin AM, Hochberg M. Effectiveness of acupuncture as adjunctive therapy in osteoarthritis of the knee; a randomized, controlled trial. Ann Intern Med 2004;141:901–910.
16. Manheimer E, White A, Berman B, Forys K, Ernst E. Meta-analysis: acupuncture for low back pain. Ann Intern Med 2005;142:651–663.
17. Sunshine WI, Field TM, Quintino O, et al. Fibromyalgia benefits from massage therapy and transcutaneous electrical stimulation. J Pain Rheumatol 1996;2:18–22.
18. Clegg DO, Reda DJ, et al. Glucosamine, chondroitin sulfate, and the two in combination for painful knee osteoarthritis. N Engl J Med 2006;354:858–860.
19. Haqqui TM, Anthony DD, Gupta S, et al. Prevention of collagen-induced arthritis in mice by polyphenolic fraction from green tea. Proc Natl Acad Sci U S A 1999; 96:4524–4529.
20. Kim L, Axelrod L, Howard P, et al. Efficacy of methylsulfonylmethane (MSM) in knee osteoarthritis pain; a pilot clinical trial. Paper presented at: American Association of Naturopathic Physicians 20th annual meeting; August 24–27, 2005; Phoenix, AZ.
21. Duffy EM, Meenagh GK, McMillan SA, et al. The clinical effect of dietary supplementation with omega-3 fish oils and or copper in systemic lupus erythematosus. J Rheumatol 2004;31:1551–1556.
22. McAlindon TE. Influence of vitamin D status on the incidence of progression of knee osteoarthritis. Ann Intern Med 1996;125:353–361.
23. Bischoff-Ferrari HA, Zhang Y, Kiel DP, Felson DT. Positive association between serum 25-hydroxyvitamin D level and bone density in osteoarthritis. Arthritis Rheum 2005;53:821–826.
24. Merlino LA, Curtis J, Mikuls TR, Cerhan JR, Criswell LA, Saag KG, Iowa Women's Health Study. Vitamin D intake is inversely associated with rheumatoid arthritis: results from the Iowa Women's Health Study. Arthritis Rheum 2004;50:72–77.
25. McAlindon TE, Jacques P, Zhang Y, et al. Do antioxidant micronutrients protect against the development of knee osteoarthritis? Arthritis Rheum 1996;39:648–656.
26. Beauchamp GK, Keast RSJ, Morel D, et al. Ibuprofen-like activity in extra-virgin olive oil. Nature 2005;437: 45–46.
27. Pattison DJ, Harrison RA, Symmons DPM. The role of diet in susceptibility to rheumatoid arthritis: a systematic review. J Rheumatol 2004;31:1310–1319.
28. Felson DT. Weight loss reduces the risk for symptomatic knee OA in women: the Framingham study. Ann Intern Med 1992;116:535–542.
29. Walker WK, Keats DM. An investigation of the therapeutic value of the "copper bracelet" - dermal assimilation of copper in arthritic/rheumatoid conditions. Agents Actions 1976;6:454–459.
30. Valbona C, Hazlewood CF, Jurida G. Response of pain to static magnetic fields in postpolio patients: a double-blind pilot study. Arch Phys Med Rehab 1997;78:1200–1203.
31. Weintraub MI. Magnetic biostimulation in painful diabetic peripheral neuropathy: a novel intervention. Am J Pain Manage 1999;9:9–18.
32. Chang YR, Bliven ML. Anti-arthritic effect of bee venom. Agents Actions 1979;9:205–211.
33. Eiseman JL, Von Bredow J, Alvar AP. Effect of honeybee (*Apis mellifera*) venom on the course of adjuvant-induced arthritis and depression of drug metabolism in the rat. Biochem Pharmacol 1982;31:1139–1146.