



ALTERNATIVE MEDICINE ALERT™

A Clinician's Guide to Alternative Therapies

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Acupuncture for Quick Relief of Asthmatic Exacerbation

By Dónal P. O'Mathúna, PhD

ASTHMA AFFECTS MORE THAN 14 MILLION AMERICANS—between 3% and 6% of adults and between 8% and 12% of children¹—and its incidence and severity are increasing.² In a survey of patients with controlled asthma, 33% reported canceling or rearranging activities within the past month, and 47% missed one or more days of work or school that month because of their asthma; 14% had visited an emergency room within the year, and 5% were hospitalized.²

There has been much interest in the use of alternative and complementary therapies for asthma.³⁻⁵ A survey found that 22% of Dutch general practitioners viewed acupuncture as an effective asthma treatment.⁶ The NIH Consensus Statement on Acupuncture stated that acupuncture may be beneficial for asthma but only as part of a comprehensive management program.⁷

History and Methods

The history of acupuncture's use, and its popular use for smoking cessation, were reviewed recently in this publication.⁸ Acupuncture is administered while patients sit or recline comfortably. Acupuncturists use numerous needle sites for asthma, with the back, neck, and ears used most frequently. Laser acupuncture is becoming more common, since it is painless, avoids needle infection problems, and has had comparable effectiveness to needle acupuncture with some disorders.^{9,10}

Mechanism of Action

The mechanism of action of acupuncture in asthma is unknown. Acupuncture raises levels of endorphins and cortisol in animals.¹¹ One hypothesis suggests that acupuncture could ameliorate a chronic inflammatory disease through circulation of endorphins and corticotrophin, both of which are made from the same prohormone and are released simultaneously from the pituitary.¹¹ Clinical studies have not verified this hypothesis.

Acupuncture Schools of Practice

Acupuncture has two broad schools of practice: classical and for-

INSIDE

*Milk thistle
for treatment
of acute
hepatitis,
chronic
hepatitis, and
cirrhosis
page 113*

*Tai Chi
to prevent
falls in
the elderly
page 116*

*Dangers
of
Ma-huang
page 119*

*More uncon-
ventional
cancer
therapies
page 119*

mula. Traditional Chinese Medicine (TCM) acupuncturists use classical acupuncture, evaluating patients individually and varying acupuncture points for the same condition between patients. TCM acupuncturists view acupuncture as inseparable from other aspects of TCM, such as pulse diagnosis, yoga, and herbal remedies.

Other acupuncturists, those of the formula school, use standard acupoints for specific disorders and isolate acupuncture from other TCM therapies. Classical acupuncturists criticize the latter approach as a “recipe book” form of acupuncture, unrelated to real practice.¹² All studies cited other than reference 13 used formula acupuncture.

Clinical Studies—Quick Relief

Numerous case studies and several uncontrolled trials report dramatic relief of asthmatic symptoms using acupuncture. Zang reported that acupuncture immediately and completely relieved symptoms in 98.9% of 192 asthma patients and that 76.5% of patients had marked long-term improvement.¹⁴

The results of controlled studies have been less remarkable. The earliest study found that acupuncture significantly improved three of five pulmonary functions compared to sham acupuncture's effect ($P < 0.05$).¹⁵ After either type of acupuncture, isoproterenol aerosol (a beta agonist) produced greater improvement in all measures. Tashkin et al induced bronchoconstriction using

methacholine, followed by either acupuncture, isoproterenol, sham acupuncture, nebulized saline, or no treatment.¹⁶ Acupuncture significantly improved all pulmonary functions ($P < 0.05$), though administration of isoproterenol produced markedly greater improvements ($P < 0.05$).

Takishima et al studied changes in respiratory resistance in 10 patients while they received true and sham acupuncture.¹⁷ Significant reductions were found with 38% of true acupuncture treatments, 6% of sham treatments, and 71% of metaproterenol treatments ($P < 0.01$). Takishima also noted large discrepancies between patients' subjective reports of changes and objective pulmonary measurements (subjective improvements were reported in 77% of acupuncture treatments).

Luu et al found acupuncture significantly ($P < 0.05$) improved FEV₁, but not vital capacity, compared to sham acupuncture.¹⁸ However, changes after salbutamol aerosol were significantly better than acupuncture on both measures ($P < 0.01$). Other studies have found no significant improvements in acute symptoms after acupuncture compared to sham.^{11,19,20} Another found that true acupuncture protected against exercise-induced asthma ($P < 0.01$), but so did sham acupuncture, although to a lesser extent ($P < 0.02$).²¹

Clinical Studies—Repeated Use

Acupuncture is more commonly used as an adjunct to long-term asthma control. Tashkin et al (1985) believed that they were the first to examine repeated acupuncture treatments.¹¹ They found no significant improvements, either short-term or long-term, in pulmonary function, drug use, or subjective reporting. Dias et al found that all patients in their control group had better objective results after sham treatments ($P < 0.01$), and eight of the 10 controls felt better, too.²²

Christensen et al reported limited positive findings for acupuncture.²³ After two weeks, treated patients had significantly higher peak expiratory flow rates (PEFR) and lower medication use than the control group ($P < 0.05$). However, initial improvements were gradually lost, despite continued therapy, with no significant differences between the groups for the rest of the study. Tandon et al found no significant differences in pulmonary function tests, medication usage, or patients' subjective reports when using laser acupuncture.¹⁰ Another study found that laser acupuncture was not effective in preventing exercise-induced asthma.⁹

Systematic Reviews

Four systematic reviews concluded that this topic lacks high-quality studies.^{1,4,6,24} A 1991 review scored

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the 13 best controlled studies on the basis of 18 predetermined methodologic criteria. Only three of the eight positive studies scored above 50 (out of 100), while all five negative studies scored over 50.⁶ The highest score was 72 (for reference 11). The variety of pulmonary measures used made meta-analysis impossible, and all the studies used small subject groups.

Jobst's review identifies problems with the choice of sham acupoints, claiming that many investigators used sham acupoints which TCM uses for various respiratory conditions.⁴ Jobst then reevaluated the asthma research, finding that acupuncture was more effective than first appeared. However, Jobst included unblinded studies in this reevaluation. Linde et al used a panel of physician acupuncturists to evaluate the adequacy of acupuncture in the studies and found little correlation between members' evaluations.²⁴

There appears to be great diversity in what constitutes

good acupuncture therapy. A 1997 review concluded that "no recommendations can be made one way or the other to either patients, their physicians, or acupuncturists on the basis of the available data."¹

Adverse Effects

Classical acupuncturists forewarn patients that acupuncture will initially exacerbate disease symptoms but will improve them later. In 16 asthma studies, 23 of the 320 subjects (7%) reported side effects such as fainting, ear ache, mild nausea, and dizziness.⁴ More serious adverse effects from acupuncture, though rare, include pneumothorax and infection.⁸ Compared to pharmacological asthma treatments, however, acupuncture has fewer side effects of lesser severity.

Unfortunately, avoidable deaths from asthma have been reported when patients refused conventional care, preferring acupuncture.^{25,26} Increased use of acupunc-

Table
Results of Controlled Research Studies* of Acupuncture for Asthma

Study	Study Type	Asthma Type	n	Therapy Frequency	FEV ₁ /PEFR Improvement	Other Lung Functions	Reduction in Medication Usage	Subjective Improvement
Ref 15	double-blind, randomized	chronic and histamine-induced	20	once	significant/NA	2 others had significant changes and 2 nonsignificant		nonsignificant
Ref 16	double-blind, randomized, crossover	methacholine-induced	12	once	significant at 120 min. (nonsignificant beforehand)/NA	significant for 3 other measures		
Ref 17	single-blind, randomized	chronic	12	once		significant 10 of 26 treatments		significant 20 of 26 times
Ref 22	double-blind, randomized	chronic	20	once	NA/reverse significant		larger reduction in control	better for control
Ref 18	single-blind, randomized	chronic	17	once	significant/NA	1 other nonsignificant		
Ref 21	single-blind, randomized	exercise-induced	19	once	significant/significant	significant		
Ref 20	double-blind, randomized, crossover	histamine-induced	16	once	nonsignificant/NA	nonsignificant		
Ref 9	double-blind randomized	exercise-induced	13	once	nonsignificant/NA			
Ref 23	double-blind, randomized	chronic	17	twice weekly for 5 weeks	NA/significant after 2 weeks		significant after 2 weeks	significant on weekly scale, but not daily
Ref 11	double-blind, randomized, crossover	chronic	25	twice weekly for 4 weeks	nonsignificant/NA	nonsignificant for 3 other measures	nonsignificant	nonsignificant
Ref 13	double-blind, randomized	COPD (asthma in 4 subjects)	24	13 times over 3 weeks	nonsignificant/nonsignificant	1 other significant and 1 nonsignificant		significant
Ref 10	double-blind, randomized, crossover	chronic	15	twice weekly for 5 weeks	nonsignificant/NA	3 others nonsignificant	nonsignificant	nonsignificant

* Studies arranged chronologically for quick relief and repeated use

ture has been thought to contribute to increased asthma mortality in France.²⁶ Indeed, the most favorable review of this research still cautions that abandoning conventional treatment “may be dangerous since it controls asthma and chronic bronchitis very effectively.”⁴

Conclusion

Acupuncture for quick relief of asthma has had some positive results, but high-quality studies are lacking. When acupuncture demonstrated significant benefits, standard pharmaceutical approaches gave markedly better improvements. Studies of long-term effectiveness consistently do not find objective pulmonary benefit. However, subjective improvements are often reported but without correlation with objective parameters.

The National Asthma Management Guidelines using conventional therapy are poorly complied with, suggesting that significant benefits in asthma control could be attained through better adherence to well-supported strategies.² Clinical studies do not warrant adding acupuncture to maintenance therapy such as inhaled steroids. For those already using acupuncture, adverse effects appear infrequent. However, caution should be exercised lest subjective improvements mask early signs of an exacerbation and delay pursuit of effective treatment. ❖

The author is Professor of Bioethics and Chemistry at Mt. Carmel College of Nursing, Columbus, OH. He acknowledges Joseph G. Lutz, MD, and Robin Lutz, RN, for valuable input in preparing this article.

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Milk Thistle for Treatment of Acute Hepatitis, Chronic Hepatitis, and Cirrhosis

By E.P. Barrette, MD

SINCE THE INTRODUCTION OF TESTS FOR HEPATITIS C, public awareness of chronic hepatitis has become acute. In the United States, 1.4% of adults have hepatitis C, which is the number one reason for liver transplantation. Up to 85% of acute hepatitis C infections develop into chronic hepatitis which may then progress to cirrhosis. Other important causes of chronic hepatitis are hepatitis B virus, alcoholism, toxic drug side effects, and autoimmune disease.

Milk thistle has been promoted for treatment of acute and chronic liver conditions, resulting in U.S. sales of more than \$3 million in 1997. In Germany, milk thistle ranks among the top 10 herbal supplements, with sales of \$18 million annually.¹

Botany and Nomenclature

Milk thistle (*Silybum marianum* and, in older texts, *Carduus marianus*) is found widely in Europe, Eastern Africa, and North America. It is a member of the aster family (Compositae/Asteraceae) and grows up to 10 feet tall. It bears a bright purple brushlike flower, and, in summer, it produces black seeds from which the drug is derived.

Other common names have been used including holy thistle, St. Mary thistle, marian thistle, lady's thistle, and royal thistle. Its spiritual names stem from the belief that the white veins on the plant's leaves carried the milk of the Virgin Mary; its chivalrous names come as it is found near Dumbarton Castle.²

History

The milk thistle has been used for 2000 years as a medicinal herb. The Latin name, *Silybum*, was derived by Dioscorides, an herbalist in ancient Greece who used the term *silybon* to describe thistle-like plants. Pliny the Elder, a Roman writer (AD 23-79), recorded that the plant's juice was excellent for "carrying off bile." Culpepper (1787), an English herbalist, described its use in removing obstructions to the liver and spleen and as a remedy for jaundice. The Eclectics, a late 19th century school of medical herbalists, used milk thistle for congestion in the liver, spleen, kidney, varicose veins, and in menstrual dis-

orders. Milk thistle is widely used in Europe, where it has been commercially available for almost 30 years.

Pharmacology and Pharmacokinetics

In 1968, a mixture of flavonolignans, called silymarin, was first isolated from milk thistle. The fruit contains 4-6% of silymarin. The isomeric components of silymarin are silybin, silychristin, and silydianin. Silybin is reportedly the most biologically active component. Schulz reports that there are four active isomers, and silybinin is the most active. He breaks down silybin to silybinin and isosilybinin, and says that silymarin is most concentrated in the protein layer of the seed husk.³

Silymarin has poor water solubility. Oral bioavailability ranges from 23% to 47%. Absorption is rapid, with peak plasma concentrations measured in 1-2 hours. Less than 10% is excreted in the urine, and 20-40% is recovered in the bile as glucuronide and sulfate conjugates. Ninety percent of the total silybin in plasma is conjugated. The elimination half-life is estimated to be six hours. A phosphatidylcholine silybin complex was developed to improve bioavailability.⁴

Mechanism of Action

Multiple actions have been proposed, including antioxidation, liver cell regeneration through protein synthesis, and membrane stabilization. In vitro studies demonstrate antioxidant activity against the hydroxyl free radical (a reactive oxygen molecule) and increased protein synthesis in hepatocytes. A mechanism involving stabilization of lipid membranes is based on studies showing silymarin inhibition of lipid peroxidation of hepatocytes, Kupffer cells, and microsomal membranes in rats. Also, inhibition of leukotriene formation, which has a role in liver damage, by silymarin in phagocytes from human livers has been seen.⁵

Clinical Studies

Several studies of acute viral hepatitis treated with silymarin suggest improved outcomes. In a randomized, double-blind controlled trial (RDCT) of 57 patients with acute hepatitis A or B treated with silymarin 140 mg tid or placebo for 3-4 weeks, AST, ALT, and bilirubin levels were lower by day five in the treatment group.⁶ At three weeks, more patients had normalized their bilirubin and AST in the silymarin group. Treatment did not improve the clearance of hepatitis B surface antigen (HBsAg).

However, a more recent study of misoprostol for acute hepatitis B included a silymarin arm that did not confirm these results.⁷ Fifty-two nonalcoholic males were randomly assigned to silymarin 210 mg/d (20 subjects), misoprostol 800 mcg/d (20 subjects), or no drug treatment (12 control subjects). Treatment was started less

Milk Thistle Gets Positive Reviews in Mainstream Media

Although mainstream media coverage of milk thistle has been sparse, those publications with recent coverage of the herb give positive feedback on its use in fighting liver disease.

In an article in the October 1997 issue of *Better Nutrition*, the author classifies milk thistle as the only herb that has proven clinical effectiveness—through numerous controlled clinical studies and an excellent safety record. Furthermore, he states that this herb is the best-researched in terms of known active constituents.

In his book, *Eight Weeks to Optimum Health*, Andrew Weil, MD, suggests that patients with liver problems take

this herb because it is nontoxic and cheap—and because conventional medicine offers nothing comparable for these patients. He also says milk thistle is safe for patients to take indefinitely. The May-June 1997 issue of *Natural Health* reports that the only side effect has been loose stools for the first few days of use.

Although patients may be tempted to grow this herb themselves, the plant's prickly leaves make it painful to harvest, according to an article in the most recent *Prevention's Guide to Healing Herbs*. It's easier, faster, and may be safer to buy milk thistle formulations.

A survey of various health, drug, and discount stores found various formulations, dosages, and prices for milk thistle. For example, neither the Target nor K-Mart stores visited carried milk thistle. GNC, Eckerd Drugs, and CVS Pharmacy all carry at least one brand. ■

than four days after the onset of jaundice and continued for four weeks. No improvement in bilirubin, AST, ALT, duration of hospitalization, or clearance of HBsAg was seen with silymarin, compared with controls.

The studies of silymarin and chronic liver disease are likewise mixed. A double-blind trial of 30 alcoholic patients with biopsy-confirmed cirrhosis excluding those with hepatic decompensation showed normalization of AST, ALT, bilirubin, and suppressed lymphocytotoxicity at one month with silymarin 140 mg tid compared to placebo.⁸ No attempts to monitor continued alcohol use were made.

However, a larger RDCT of 116 patients with histologically confirmed alcoholic hepatitis compared silymarin 420 mg/d with placebo for three months.⁹ Fifty-eight patients had cirrhosis on biopsy. Both silymarin and placebo gave similar improvements in laboratory and histological parameters after three months.

Two frequently quoted studies support the use of milk thistle. The first is a RDCT in which 106 young soldiers were enrolled after admission to a military hospital for an elevated ALT or AST persisting longer than one month.¹⁰ Subjects were randomized to silymarin 420 mg/d or placebo for one month. Although alcohol was the presumed cause in all subjects, 20% denied daily alcohol use at entry. At four weeks, statistically significant improvements in the mean percentage change of the AST (silymarin decreased 30% vs placebo increased 5%) and ALT (silymarin decreased 41% vs placebo increased 3%) were seen. Liver biopsies were performed on 90 patients at entry but only 29 at four weeks. Silymarin treatment improved histology, but the reasons for the low rate of repeat biopsy were not detailed and no

measure of alcohol abstinence was included in the study.

In the second trial, 170 patients with cirrhosis were randomized to treatment with silymarin 140 mg tid or placebo for 2-6 years (mean follow-up, 41 months).¹¹ In each arm, 54% were alcoholic. Patients with known malignancies, end-stage liver disease, primary biliary cirrhosis, or who were receiving immunosuppressive therapy were excluded. No improvement in transaminases or bilirubin was seen in the 105 patients completing the planned two-year study. Overall survival at two years was better with silymarin (77% vs 67%; $P = 0.07$). Subgroup analysis showed the survival benefit to be limited to alcoholics ($P = 0.01$) and to those rated Child A at entry ($P = 0.03$). More patients receiving placebo continued to drink than those receiving silymarin.

One other recently published study was unable to confirm a mortality benefit with silymarin for cirrhosis but suggested one for hepatitis C. Two hundred alcoholic patients with histologically confirmed cirrhosis were entered in a RDCT comparing silymarin 150 mg tid with placebo.¹² Patients with life expectancy of less than six months, hepatitis B, autoimmune disease, primary biliary cirrhosis, or who were receiving colchicine or corticosteroids were excluded. Forty-two patients dropped out, while 125 patients completed the two-year study. Clinical and laboratory parameters improved equally with silymarin or placebo.

Provocatively, stored sera for 75 patients were analyzed for hepatitis C, and 39% were positive. Silymarin may have influenced survival for hepatitis C positive patients (0 deaths in 13 patients receiving silymarin vs 4 deaths in 16 receiving placebo). Although this difference was not statistically significant ($P = 0.059$), it was still impressive.

Adverse Effects

No serious adverse have been seen with milk thistle. Animals subjected to very high doses of milk thistle showed no toxic effects. Some patients report looser stools. In the largest clinical trial, arthralgias, headaches, and urticaria were rarely reported. There are no reported drug interactions.

Table

Sample Milk Thistle Prices

Brand	Formulation	Price/Count
Nature's Resource	140 mg (70% silymarin)	\$11.99/50
	200 mg (80% silymarin)	\$26.99/100
NaturalLife	175 mg (80% silymarin)	\$12.99/40
Nature Fingerprint	200 mg (80% silymarin)	\$21.99/100
Jarrow	150 mg (80% silymarin)	\$11.49/100
Pure Encapsulations	250 mg (80% silymarin)	\$11.80/120

Sample Allopathic Medication Prices

Interferon		\$225/month
Rebetron (Ribavirin/ Interferon Alpha-2b) 1200 pack	84 capsules of 200 mg ribavirin (starting dose for > 75 kg) and supply of interferon in multi-dose vial	\$720/two weeks (AWP)
Rebetron (Ribavirin/ Interferon Alpha-2b) 1000 pack	70 capsules of 200 mg ribavirin (starting dose for < 75 kg) and supply of interferon	\$651.59/two weeks (AWP)

Formulation and Dosage

Milk thistle products are standardized by the amount of silymarin extract, which is generally 70-80%. Because of the drug's poor water solubility, teas and water-based infusions provide less than 10% of the initial silymarin content. The German Commission E, an expert committee responsible for evaluating the safety and efficacy of herbal medicines, has recommended milk thistle as supportive treatment for chronic inflammatory liver conditions. Unless otherwise prescribed, the Commission E recommends a daily dose of 12-15 g, or a formulation equivalent to 200-400 mg of at least 70% silymarin. No one makes recommendations for duration of therapy.

Summary

Milk thistle has become a popular herbal supplement for hepatitis and cirrhosis. There is extensive in vitro and animal data suggesting a hepatoprotective benefit with silymarin. However, the clinical studies are mixed. The positive studies in alcoholic hepatitis and cirrhosis showing improved transaminase levels and mortality must be viewed alongside studies that are equally well

done and that show milk thistle to be no better than placebo. There are no published controlled trials with milk thistle and hepatitis C, although investigators at Cedars-Sinai in Los Angeles have recently initiated one. The FDA recently approved the use of ribavirin with interferon alpha-2b for chronic hepatitis C infection in adults whose disease has relapsed following alpha interferon monotherapy. This combination increases the sustained response to 40-50%, compared to less than 20% for interferon alone. However, these treatments have frequent adverse effects and are expensive.

Recommendations

For patients with hepatitis or cirrhosis, milk thistle appears to be safe and inexpensive. For patients with alcoholic liver disease, abstinence remains the cornerstone of therapy, and, for patients at risk for hepatitis A and B, vaccines are available. For patients with chronic hepatitis C, milk thistle remains unproven. For patients with acute viral hepatitis, alcoholic hepatitis, and cirrhosis, a modest benefit may exist, but the evidence remains inconclusive. Physicians may wish to try milk thistle for chronic hepatitis but should know the evidence only suggests a benefit in early cirrhosis and chronic hepatitis. ❖

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Tai Chi to Prevent Falls in the Elderly

By Jay K. Udani, MD

THE U.S. ELDERLY POPULATION HAS A ONE IN THREE chance of sustaining a fall this year, and half of those who do fall will fall again.¹ The risk goes beyond injury, death, and the \$10 billion annual direct health care costs. Those who fall become fearful, withdrawn, and experience social and functional deterioration.¹ Numerous risk factors are associated with falling, and impairment of gait and balance are two chief risk factors associated with falling.¹ Interventions that improve balance have been proven to reduce the risk of falling, and Tai Chi, an ancient Chinese Martial Art form, may help restore balance to the elderly patient.

Risk Factors

Structural and motor risk factors for falls include impaired balance, muscle weakness and atrophy, reduced flexibility, and reduced range of motion. These, together with visual impairment, contribute to impaired gait, which itself is a risk factor. Incontinence and benign prostatic hyperplasia may cause leakage and slipping, or may necessitate multiple trips to the bathroom in the middle of the night and dangerous navigation through the darkness. Sedatives, antidepressants, and antihypertensives increase fall risk, and patients on more than four medications of any kind are at increased risk.^{1,2} Fear of falling, difficulty falling asleep at night, and having fallen in the past year are also significant risk factors for future falls.

History/Culture/Tradition

Tai Chi traces its roots to the development of Yoga in ancient India. In the 5th century AD, an Indian sage named Bodhidharma introduced the foundations of Yoga to the Shaolin monks of southern China, who eventually formed the basis for the martial arts.³ In the 13th century AD, Chang Sang Feng developed a new form of the mar-

tial arts, called Tai Chi.⁴ It is said that he developed Tai Chi after watching a stork and snake fight.⁵ Over the centuries, various Chinese families developed a number of different Tai Chi styles, each named for that particular family. The most common style practiced today is the Yang school of Tai Chi, developed in the 19th century.

The literal translation of Tai Chi Chuan (also known as taji, taji-quan, and tai chi) reveals that Tai means “moving” or “movement;” Chi means “life force;” and Chuan means “fist.” Tai Chi Chuan is a set of flowing movements based on animal postures. The routines, called “forms” or “sets,” are designed to stimulate and balance the Chi in the body.⁶ Many of the “forms” simulate the movements of long-lived animals, including storks and turtles.

What began as a form of self-defense for monks has evolved over the centuries in China to become a system of balance and muscular control designed to improve and maintain physical health, calm the mind, enhance the powers of meditation, and increase longevity.⁷ Sometimes called “moving meditation,” Tai Chi and its related discipline, Qi Gong, are practiced by tens of millions of Chinese daily.

Medical Claims

Numerous claims have been made about the healing properties of Tai Chi. These include the ability to decrease blood pressure, cholesterol,³ tension, depression, fatigue, and anxiety;⁸ to prevent thrombosis;⁷ and to improve circulation, digestion, and appetite.³

Principles

Two fundamental principles of Traditional Chinese Medicine are chi (life force or energy) and balance. Balance in one’s life allows a person to maintain a strong and unblocked flow of chi, which, in turn, results in the ability to prevent illness and improve health.

The three basic principles of Tai Chi are: 1) the body should be extended and relaxed; 2) the mind must be alert but calm; and 3) all body movements require a well-coordinated sequencing of segments.⁸ The basic stance in Tai Chi involves five attributes that make it unique among the martial arts.³ This stance is combined with deep diaphragmatic breathing, which is common to the martial arts and many forms of meditation.

Mechanism of Action

Tai Chi teachers instruct patients how to walk safely with a narrow stance and rotate their bodies slowly. Practitioners of Tai Chi become familiar with their own physical limitations through practice of the various “forms.” Every session takes the practitioner to the edge between balance and falling.

Clinical Trials

We searched Medline by PUBMED and OVID, as well as the Internet, published bibliographies, and alternative medicine literature CD-ROMs using the keywords “Tai Chi,” “Tai Chi Chuan,” and “Martial Arts.” All studies identified and reviewed here include community-dwelling populations. All studies showing significant reductions in falling or the risk factors associated with falling had Tai Chi interventions lasting between 10 and 15 weeks, and varying from one to three times per week.

Three modifiable risk factors for falls in the elderly are flexibility, balance, and strength, as noted above. All but one study¹⁰ looked only at the ability of Tai Chi to modify these and other risk factors as a surrogate for decreasing the rate of falls in the elderly.

Two studies showed significantly increased flexibility in the Tai Chi populations vs. the control population. One study looked at veteran practitioners with an average of 12 years of experience,¹¹ and the other introduced the intervention group to Tai Chi for 12 months.¹² The study with the experienced practitioners showed a non-significant increase in flexibility as measured by an electronic inclinometer.¹¹ The other study showed a significant increase of 11% in thoracic/lumbar flexibility ($P < 0.05$) and an 18.1% increase in muscle strength of knee extensors ($P < 0.01$).

Two uncontrolled studies examined the issue of balance. One, a case series, compared Tai Chi practitioners to non-practitioners on five separate balance tests.¹³ The Tai Chi practitioners did significantly better ($P < 0.05$) on three of the five tests. The other study was also a case series of a self-selected group of elderly volunteers.¹⁴ This study showed a significant increase in the Single Limb Timed Test (a validated test for measuring balance in the elderly) with eyes open ($P < 0.05$) after Tai Chi. The same study failed to show a difference in the SLTT balance test performed with eyes closed.

A large study exposed 110 patients to either balance training, strength training, balance and strength training, or fall prevention education alone.¹⁵ After three months of intervention, all patients in all groups were assigned to six months of weekly Tai Chi classes to assess whether Tai Chi would sustain the gains. Tai Chi sustained some of the improvements but not significantly.

The only study in the literature to measure the rate of falls in addition to modifying risk factors came out of the FICSIT (Frailty and Injuries: Cooperative Study of Intervention Techniques) trial.¹⁰ This was a prospective, controlled, clinical trial with 200 healthy, ambulatory, community-dwelling elderly patients randomized to one of three arms: Tai Chi, computerized balance training, and a control group that received fall prevention educa-

tion. Data collection was blinded.

The intervention lasted 15 weeks, with four months of follow-up. The Tai Chi classes condensed the 108 classic Yang forms of Tai Chi into 10 forms that included a progressive reduction of standing support until a single-limb stance was achieved. Classes were held twice weekly, and home practice was encouraged but not monitored. The most clinically significant outcome measured was the occurrence rate of falls. After performing a multivariate analysis to adjust for confounding variables, the Tai Chi group demonstrated a 47.5% reduction in the rate of falls compared with the balance training and education groups ($P = 0.01$; risk ratio = 0.525). The Tai Chi group also showed a significant reduction in fear of falling ($P = 0.046$) compared with the balance training and education groups. The benefits of 15 weeks of twice weekly Tai Chi were found to remain four months after formal instruction had ended.¹⁰

Adverse Effects

To date, there have been no adverse effects attributed to Tai Chi in the literature. In one controlled study of the safety of Tai Chi in rheumatoid arthritis patients, Tai Chi did not significantly increase joint tenderness, number of swollen joints, or grip strength.¹⁶ Although improved flexibility and range of motion are the goals of treatment in patients with arthritis, weight-bearing exercise is reluctantly recommended by physicians for fear of aggravating joint symptoms¹⁶ and potentially exacerbating the ongoing degenerative changes.⁶

There are no data on patients who already have fallen, nor are there data for patients who are currently taking anticoagulants.

Conclusion

Every patient over age 65 needs a risk assessment for falls. Medication lists should be reviewed, and specific medical conditions such as incontinence, BPH, and decreased visual acuity need to be addressed. External hazards at home, such as throw rugs and extension cords, should be eliminated, and grab bars and night-lights should be installed where necessary.

If patients have impairments in balance, strength, flexibility, or gait, current practice is a physical therapy baseline evaluation, supervised activity when possible, and physical therapy when appropriate.

If patients are healthy, ambulatory, and willing, we recommend that they also consider Tai Chi classes to reduce their risk of falling. In the case of patients with balance impairment specifically, we would recommend Tai Chi as primary therapy for fall prevention. Patients who practice Tai Chi, alone or with others, several times

weekly for at least 10 weeks should expect to improve their balance and flexibility. ❖

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CME Questions

21. Interest in the use of acupuncture for asthma has been stimulated by:
 - a. the side effects of conventional pharmacological treatment.
 - b. the continued incidence of symptoms during conventional care.
 - c. widespread belief that acupuncture is effective for asthma.
 - d. all of the above.
22. One of the biggest dangers with using acupuncture for asthma is:
 - a. infection from unclean needles.
 - b. neglecting conventional treatment.
 - c. severe pain.
 - d. allergic reactions to needles.
23. The best evidence supporting milk thistle use is a randomized controlled trial by Ferenci et al. Which of the following is correct?
 - a. Overall survival at two years was statistically improved with milk thistle.
 - b. Transaminases improved with milk thistle.
 - c. Survival benefit was limited to patients initially classified as Child B and C.
 - d. Survival by life table analysis was significant at four years (58% vs 38%; P = 0.036), though only 11 of 170 subjects made it to 50 months.
24. All of the following are risk factors for falling in the elderly except:
 - a. deterioration of strength.
 - b. BPH.
 - c. impairment in balance.
 - d. more than two medications.
25. Tai Chi reduces the risk of falling by improving all of the following except:
 - a. balance.
 - b. strength.
 - c. range of motion.
 - d. flexibility.

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With Comments from John La Puma, MD, FACP

Dangers of Ma-huang

Source: Powell T, et al. Ma-huang strikes again: Ephedrine nephrolithiasis. *Am J Kidney Dis* 1998;32:153-159.

EPHEDRINE AND ITS METABOLITES are naturally occurring alkaloids that can be derived from evergreens worldwide, and they have been used as medicinals for centuries. The alternative medicine industry has popularized them as “herbal ecstasy” and “herbal phen-fen” and suggested many uses, including asthma control, weight loss, and energy and sexual enhancement. Several recent reviews have documented the dangerous nature of using these “drugs” unsupervised, including multiple deaths, and the FDA is currently reviewing ephedrine’s use in the alternative medicine industry.

We report a new toxicity, ephedrine nephrolithiasis, in a patient using an energy supplement, Ma-huang extract, which contains ephedrine. Although previously unreported, the Louis C. Herring and Company kidney stone database shows that this is an endemic complication of ephedrine with hundreds of previous episodes. Using gas chromatography (GC) mass spectrometry, we were able to identify the chemical structure of our patient’s stone, as well as other similar stones from Louis Herring, as containing ephedrine, norephedrine, and pseudoephedrine.

■ COMMENT

A 27-year-old male smoker with a history of body building, hypertension, and a congenitally absent left kidney developed a ureterovesical junction stone requiring basket retrieval. Three months later, he presented with a recurrence and acute renal failure. Two radiolucent stones 2 mm and 12 mm in

length were removed, and the patient’s creatinine dropped from 4.3 mg/dL to 1.3 mg/dL. Crystallographic laboratory analysis revealed 95% ephedrine metabolite and 5% protein matrix. The patient had been taking up to 12 tablets daily of Pro-Lift to enhance body building. Each tablet contains 170 mg of Ma-huang (6% ephedrine).

To their credit, the investigators called the lab, which sent them seven more stones like those of their patient. These stones also contained ephedrine. Of the 166,466 stones in the registry from January 1996-June 1997, 106 (0.06%) contained ephedrine. Seven of 15 questionnaires returned to the lab by the former stone carriers admitted to using more than 25 tablets daily of various ephedrine or pseudoephedrine preparations.

Ephedrine has played a starring and startling role in herbal medicine. At least 44 deaths have been associated with ephedrine, and the State of Florida, for one, has restricted its sale. The FDA has cautioned against ingesting more than 24 mg daily. A nonspecific alpha and beta agonist, ephedrine’s effects in herbal phen-fen are intended to mimic those of the anorexigenic agent phentermine, but appetite suppressant effects too often vaporize with proximity to the vending machine. Unfortunately, ephedrine’s toxicity does not.

Recommendation

No one should take Ma-huang for anything until it is re-classified as a pharmaceutical, its formulation is standardized, and its use can be carefully monitored. It is especially dangerous in patients with cardiovascular disease, hypertension, and, apparently, renal stone formers. People who do take it must hydrate themselves adequately—a minimum of eight glasses of water daily, and more for regular exercisers—as ephedrine is highly water soluble. ❖

More Unconventional Cancer Therapies

Source: Kaegi E. Unconventional therapies for cancer: Vitamins A, C and E. *Can Med Assoc J* 1998;158:1483-1436.

THIS IS THE LAST ANALYSIS IN A series of six that has reviewed the safety and effectiveness of unconventional therapies commonly used by Canadian cancer patients. The first three agents—essiac, green tea, and iscador—were reviewed in *Alternative Medicine Alert* in July 1998, and two more—hydrazine sulfate and 714-X—were reviewed in September.

A multimodal search process was developed to supplement traditional search techniques. Reference lists can be found on the Canadian Breast Cancer Research Initiative’s web site (www.breast.cancer.ca); annotated bibliographies are also available. Dr. Kaegi was Director of Medical Affairs and Cancer Control of the National Cancer Institute of Canada and the Canadian Cancer Society from 1993 to 1996.

Vitamins A, C, and E

Because large doses of supplemental vitamin A have serious toxic effects, retinoids like beta carotene (a provitamin—i.e., transformed in vivo into vitamin A) have been touted as treatment for some cancers. There are laboratory and animal data to suggest the increased production and tumoricidal activity of white blood cells and macrophages with retinoids, especially beta carotene and analogues of vitamin A. Clinical data are contradictory, though recent studies suggest an increased incidence of lung cancer with beta carotene supplementation.

Although epidemiologic data suggest a preventive effect of foods rich in vitamin C against stomach and cervical can-

cer, either through an antioxidant or nitrosamine blocking action, the therapeutic effects of supplemental vitamin C are less clearly documented. Anecdotal reports and uncontrolled case series suggest improved survival, although two randomized controlled trials of vitamin C therapy with advanced cancer were negative. Safety at up to 1000 mg daily has been repeatedly reported. Proponents believe that megadose, intravenous vitamin C earlier rather than later in illness has a better chance of having a beneficial clinical effect.

Like vitamin A, vitamin E is fat soluble. It is most commonly ingested in food as d-tocopherol, usually gamma, and as a supplement, most of which is synthetic, or dl-alpha tocopherol. Most clinical trials have been done with dl-alpha tocopherol. Vitamin E's lipid antioxidant and immunostimulatory effects are thought to be responsible for its anticancer effects. Toxicity with high doses—over 800 IU—can include nausea, diarrhea, and blurred vision. High doses may also interfere with the absorption of anticoagulants, iron, and vitamin B₁₂. Oral leukoplakia, a cancer precursor, may be successfully treated with vitamin E, and invasive prostate cancer risk may be reduced with 50 mg (approximately 100 IU) daily.

Conclusion

Vitamin E and vitamin C supplements are recommended in modest doses, as they are safe and may help prevent some cancers. Beta carotene supplements may be dangerous and are not recommended. Very strong cancer prevention data, especially for gastrointestinal disease, exist for low saturated fat diets that are rich in high fiber, largely unprocessed plant foods. A diet

that puts fruits, vegetables, grains, and legumes in the middle of the plate and makes animal foods side dishes is probably the best medicine. Because 250 almonds or hazelnuts are needed for 100 IU of vitamin E daily, however, a supplement is the best way to get this vitamin. ❖

Melatonin for Day Sleep or Night Alertness?

Source: Jorgensen KM, Witting MD.

Does exogenous melatonin improve day sleep or night alertness in emergency physicians working night shifts? *Ann Emerg Med* 1998;31:699-704.

TO DETERMINE WHETHER EXOGENOUS melatonin improves day sleep or night alertness in emergency physicians working night shifts, Jorgensen and Witting performed a double-blind, placebo-controlled crossover trial. They gave emergency physicians 10 mg sublingual melatonin or placebo each morning during two time-equivalent strings of night shifts. During day-sleep periods, subjective sleep data were recorded, and during night shifts, alertness was assessed using the Stanford Sleepiness Scale. Melatonin did not improve gestalt day sleep ($P = 0.3$) but did suggest a trend toward improved night alertness. Exogenous melatonin may be of modest benefit to emergency physicians on the night shift.

COMMENT

I'll bet that "ER" will feature melatonin, if it hasn't already. As sure as perception is TV reality, their docs will soon be snoozing. But, if they were real docs, would they have a chance?

These two University of Maryland physicians decided to enroll their emergency medicine residents and attendings to find out. Residents worked two, three, four, or five 12-hour overnight shifts; attendings worked two or five eight-hour overnight shifts. A washout period of five days was created. Most subjects slept the time off through, instead of a few hours after work and a few hours before.

Though the sample size was small, the authors claim that it had the power to show a dramatic benefit on day sleep or night alertness. There was no benefit. The authors also claim that this is the largest study of melatonin in night shift workers. They imply that the large dosage would not be used again (0.3 mg is probably adequate to prevent jet lag). Trends toward initial sleep time, premature awakenings, and time to fall asleep favored melatonin, but very slightly.

Though virtuous, this study suffers from many unanswered methodologic questions, from the level of activity in the ED on each night, to ways to make sense of subjects' variable time periods worked, to the uncertainties about the constancy of subjects' sleeping places and partners.

Conclusion

With nonstandardized, over-the-counter hormones now available on must-see-TV, go slowly. These data do not show real improvement in day sleep or night alertness, and melatonin is not recommended for these uses. If you recommend melatonin to patients for prevention of jet lag, suggest that it be taken in very low dose—1 mg or 2 mg—for no more than a few days at a time. See *Alternative Medicine Alert* pp. 78-81 for details. ❖

In Future Issues:

Glucosamine for Osteoarthritis Treatment

Selenium for Cancer Prevention

Gugulipid for Hyperlipidemia Treatment

Yoga for Asthma Prevention