USE OF ALTERNATIVE MEDICINE BY PATIENTS UNDERGOING CARDIAC SURGERY

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Objective: Complementary and alternative medicine may influence cardiac surgical care by inducing coagulopathies and interacting with perioperative medications. We evaluated the significance of complementary and alternative medicine use in an acutely ill cardiac surgical population and assessed the willingness of patients to reveal these activities to their physicians and surgeons.

Methods: A total of 376 consecutive patients undergoing preoperative or postoperative cardiothoracic surgical evaluations at an urban academic medical center were approached to complete a survey regarding use and attitudes toward complementary and alternative medicine. All surveys were administered and collected between March and May 1998.

Results: Completion rate was 70% ($n = 263$). Respondents were predominantly male (72%), white (76%), and well educated (59%). The overall rate of complementary and alternative medicine use was 75%, but excluding prayer and vitamins, which are often not considered complementary and alternative medicine therapies, the rate was 44%. There was no correlation between the use of complementary and alternative medicine and the parameters of gender, age, race, or education level. Only 17% responded that they had discussed complementary and alternative medicine with their physicians, and 48% responded that they did not want to discuss the topic at all.

Conclusions: Complementary and alternative medicine is used as frequently in patients undergoing cardiac surgery, as in the general population. Physicians and surgeons should be aware that patients have no inherent predisposition toward or against using complementary and alternative medicine, but that they are unlikely to volunteer their experience with it. The unwillingness of patients to discuss complementary and alternative medicine with physicians has serious implications for their safety, especially in acute care situations. (*J Thorac Cardiovasc Surg* 2000;120:335-41)

Attention from the news media, alternative medicine service providers, government agencies, and the medical community has caused the use rate of alterna-

tive medicine by the general US population to increase from 33.8% in 1990 to 42.1% in 1997.¹ This trend supports the argument that alternative or complementary medicine, defined as health interventions not generally available at US hospitals or taught widely in medical schools, has gained greater acceptance by the general population as a means of maintaining health.

However, these data do not reflect the use of alternative medicine in those patients who have serious medical conditions requiring major procedures or hospitalization, a population of individuals health care providers most commonly deal with. Several new studies have addressed this question, with up to 20% of oncology patients,² 50% of family practice patients,³ 28% of breast cancer patients,⁴ 51% of inflammatory bowel disease patients,⁵ and 38% of head and neck cancer patients⁶ using some sort of complementary or alternative therapy. Assessments of com-

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Table I. Demographic profile of the 262 patients included in the study

	N	%
Age (y)		
18-39	21	8
40-64	106	40.6
>65	134	51.3
Sex		
Male	187	71.6
Female	74	28.4
Race		
White	195	75.9
African American	17	6.6
Hispanic	16	6.2
Native American	15	5.7
Asian/Pacific Islander	10	3.9
Other	4	1.6
Marital status		
Single	23	8.9
Married	186	72.1
Divorced	12	4.7
Widowed	33	12.8
Other	4	1.6
Education		
Grade school/middle school	17	6.5
High school/equivalent	83	31.9
College/technical	90	34.6
More than college	64	24.6

plementary medicine use in specific disease processes are particularly important for the health care provider, as alternative medical therapies can have a direct effect on proper conventional medical care.

The use rate of a prominent patient population, those undergoing cardiac surgery, has not been reported. To address this shortcoming, we surveyed the use of complementary medical therapies in patients undergoing cardiac surgery in an urban hospital. In addition, patients were queried about their attitudes toward healing, their opinions of the use of alternative medicine in a complementary role with conventional medicine, and their willingness to discuss the topic with their physicians or surgeons. These results will help health care providers better understand the role of complementary medicine in the care of their patients, as well as its relationship to the patients' attitudes toward health.

Methods

The survey was conducted in the waiting area of the Cardiothoracic Surgery Service of Columbia-Presbyterian Medical Center in New York City, from March to May 1998. The questionnaire was voluntary, anonymous, and took approximately 10 minutes to complete. Eligible subjects included all English-speaking and writing adults.

The survey consists of 4 parts: demographic information, attitudes toward healing, patterns of use of complementary/alternative medicine modalities, and attitudes toward complementary/alternative medicine and willingness to discuss the topic with a physician (Fig 1). Demographic information included age, gender, marital status, level of education, and ethnic background. Questions about attitudes toward healing were rated on a scale of 1 to 10, with 1 representing "Not at all" and 10 "A great deal." The following questions were asked: "How much can you do yourself to help your body heal better, faster, or more completely?" "How much do you believe mental attitude about a medical procedure affects the outcome of the procedure?"

The next section assessed the patients' experience with complementary/alternative medicine therapies. To assess the experiences with complementary/alternative medicine techniques, we provided a list of modalities and the patients were asked, "Have you ever used any of the following?" The option of *yes* or *no* followed each modality. The modalities included in the list were as follows:

Acupuncture	Massage therapy
Ayurveda	Meditation/relaxation
Biofeedback	Naturopathy
Chelation	Nutritional therapy
Chiropractic	Prayer/pastoral counseling
Energy healing	Qi gong
Guided imagery	Reflexology
Herbs	Tai chi
Homeopathy	Vitamins
Hypnosis	Yoga
	Other

The next section examined the attitudes toward complementary/alternative medicine and the attitudes toward discussing the topic with a physician. The following questions, again rated on a scale from 1 to 10, were asked: "Do you believe any of the above therapies would assist conventional medical treatments in fighting illness?" "Do you believe any of the above therapies would promote general health and wellness?"

To assess prevalence of dialogue with their physicians on the topic of complementary/alternative medicine, as well as desire to create dialogue, we asked the patients, "Have you discussed any of the above therapies with your medical doctor/surgeon?" Again, they had the option of answering *yes* or *no*. A follow-up question, again with the option of *yes* or *no*, included, "If *no*, would you like your medical doctor/surgeon to discuss the above therapies with you?"

At the conclusion of the survey, patients were asked to place the survey in a box located in the waiting area.

Results

A total of 376 consecutive patients were approached with the questionnaire and 263 responded (response rate 70%). The patients were largely married, white men over the age of 65 years who had at least a high school education (Table I). Use was quite common in these patients, with 75% having

Table II. Pattern of complementary/alternative modality use by patients

Therapy	N	%
Vitamin	141	53.6
Prayer	95	36.1
Nutritional therapy	45	17.1
Massage	30	11.4
Chiropractic	30	11.4
Meditation	30	11.4
Herbs	26	9.9
Acupuncture	11	4.2
Homeopathy	8	3.0
Reflexology	6	2.3
Hypnosis	6	2.3
Yoga	6	2.3
Other	6	2.3
Energy	4	1.5
Tai chi	4	1.5
Aromatherapy	4	1.5
Imagery	3	1.1
Acupressure	3	1.1
Biofeedback	2	0.8
Chelation	2	0.8
Naturopathy	1	0.4
Qi gong	1	0.4
Ayurveda	0	0

used 1 of the 21 alternative treatments in the past 12 months. Of the choices, vitamins and prayer were the most popular, with use rates of 54% and 36%, respectively (Table II). However, excluding prayer and vitamins, the use rate was only 43.7%, similar to the 42.1% reported for the general population. The most popular therapies other than vitamins and prayer were nutritional therapy (17%), massage (11%), chiropractic (11%), meditation (11%), and herbs (9.9%). When using these therapies, most patients reported having used two or more therapies (57.1%).

Among the demographic variables measured (gender, age, race, marital status, or education), no significant correlation could be found with the use of alternative medicine. Among the different therapies, vitamins tended to be used mostly by older persons, more educated persons (college or higher), and white persons, and prayer and meditation tended to be used more by nonwhite persons (Table III).

When asked about their attitudes toward healing, patients believed that they had a role in their healing process (on a scale 1-10, 8.2 users, 8.0 non-users) and that mental attitude did have an effect on the outcome of medical procedures (8.7 users, 8.2 non-users), with comparable responses between users and non-users of alternative medicine. However, responses to the effectiveness of alternative therapies with conventional medicine in fighting illness (6.9 users, 4.9 non-users)

Table III. Differences found between users and non-users of some therapies on some demographic variables

	Users (%)	Non-users (%)
Vitamin use by age group		
18-39 (y)	28.6	71.4
40-64 (y)	51.9	48.1
>65 (y)	59.4	40.6
<i>P</i> = .027		
Vitamin use by racial group		
White	58.8	41.2
Nonwhite	35.5	64.5
<i>P</i> = .001		
Prayer by racial group		
White	31.9	68.1
Nonwhite	51.6	48.4
<i>P</i> = .005		
Meditation use by racial group		
White	8.8	91.2
Nonwhite	17.7	82.3
<i>P</i> = .50		
Vitamin use by education group		
College or more	59.7	40.3
<College	44.4	55.6
<i>P</i> = .017		

Table IV. Patients' attitudes toward mental outlook and health and the effectiveness of complementary/alternative medicine

	Users		Non-users		P value
	Mean	SD	Mean	SD	
Q. 1	8.17	2.07	7.98	2.12	.531
Q. 2	8.71	1.90	8.25	2.03	.098
Q. 3	6.9	2.52	4.94	2.62	.000
Q. 4	7.3	2.35	5.6	2.5	.000

On a scale of 1-10, where 1 = "Not at all" and 10 = "A great deal"

Q. 1 How much can you do yourself to help your body heal better, faster, or more completely?

Q. 2 How much do you believe mental attitude about a medical procedure affects outcome?

Q. 3 Do you believe any of the above therapies would assist conventional medical treatments in fighting illness?

Q. 4 Do you believe any of the above therapies would promote general health and wellness?

and the effectiveness in general health (7.3 users, 5.5 non-users) trended toward less effectiveness (Table IV). No differences in responses were based on demographic variables.

When queried about the patient-physician discussion of alternative medicine use, most patients had not discussed the topic of alternative medicine with their

We are very interested in your feelings about healing and your health. Please fill out this questionnaire to the best of your ability. There are no wrong answers. Check the boxes and circle the numbers that correspond to your answer.

All information will be kept strictly confidential.

Thank you very much for help.

(1) Date _____

(2) Age _____ (3) ☐ Male ☐ Female

(4) Marital Status ☐ Single ☐ Married ☐ Divorced
☐ Widowed ☐ Other _____

(5) Education ☐ Grade/Middle School
☐ High School/Equivalency
☐ College or Technical
☐ More than college

(6) Ethnic Background ☐ African-American ☐ Asian
☐ Caucasian ☐ Hispanic ☐ Native American
☐ Pacific Islander ☐ Other _____

On a scale of 1 - 10 (1 = Not at all, 10 = A Great Deal), please circle a number which best represents your feelings/attitudes to each question.

(7) How much can you do yourself to help your body heal better, faster, or more completely?

1 2 3 4 5 6 7 8 9 10
(Not at All) (A Great Deal)

(8) How much do you believe mental attitude about a medical procedure affects the outcome of the procedure?

1 2 3 4 5 6 7 8 9 10
(Not at All) (A Great Deal)

(9) Have you ever used any of the following therapies over the last 12 months? Circle yes or no to all that apply.

Therapy

Acupressure Yes/No
Acupuncture Yes/No
Aromatherapy Yes/No
Ayurveda Yes/No
Biofeedback Yes/No
Chelation Yes/No
Chiropractor Yes/No
Energy Healing Yes/No
Guided Imagery Yes/No
Herbs Yes/No
Homeopathy Yes/No
Hypnosis Yes/No

Massage Therapy Yes/No
Meditation Yes/No
Naturopathy Yes/No
Diet Modification Yes/No
Prayer/Pastoral Counseling Yes/No
Qi Gong Yes/No
Reflexology Yes/No
Tai Chi Yes/No
Vitamins Yes/No
Yoga Yes/No
Other _____

Fig 1. Questionnaire distributed to patients.

(9) Have you discussed any of the above therapies with your medical doctor/surgeon? ☐ Yes ☐ No

If NO, would you like your medical doctor/surgeon to discuss the above therapies with you? ☐ Yes ☐ No

(10) Do you believe any of the above therapies would assist conventional medical treatments in fighting illness?

1 2 3 4 5 6 7 8 9 10
(Not at All) (A Great Deal)

(11) Do you believe any of the above therapies would promote general health and wellness?

1 2 3 4 5 6 7 8 9 10
(Not at All) (A Great Deal)

Fig 1. Cont'd Questionnaire distributed to patients.

physicians or surgeons. Only 17% responded that they had discussed the topic. Of the 83% who had not discussed the topic, only 36% responded that they would like to discuss the topic with their physicians and 48% responded that they did not want to discuss the topic; 16% did not respond to this question.

Discussion

The results of this study demonstrate that the use of techniques other than conventional medicine is quite high (75%) in patients undergoing cardiac surgery. However, when prayer and vitamins are excluded from the analysis, as they are not always considered “complementary medicine,” use by this population of patients is similar to that of the general population—43.7% (surgical population) versus 42.1% (general population). Moreover, the selection of therapies is also similar. In the general population study, relaxation techniques, herbal medicine, massage, and chiropractic therapies were the most popular; among patients with cardiac disease, nutrition, massage, herbs, chiropractic, and meditation were most often used.

The similar utilization rates show that patients with cardiac disease accept alternative medicine as readily as the general population. One may have believed that patients with major medical conditions, who are already accessing medical resources at a higher rate, might choose to access alternative medicine more freely. Alternatively, one could postulate that the diseased state of these patients is a result of self-neglect and might correlate with a lower predicted use rate. Neither appears to be the case.

Since our patients believe that mental attitude is an important element of healing, addition of alternative

therapies as an empowering tool would appear rational. The observation that non-users tended to have less faith in the role of a positive mental attitude would suggest that patients who use complementary medicine may be more inclined to take an active role in their healing. Unfortunately, we are unable to determine whether patients originally had a more positive outlook and therefore chose to use complementary therapies or whether the complementary therapies increased confidence in the role of mental outlook. If the latter is true, then health care providers may be able to integrate complementary therapies into the care program to help modify a patient's belief system and improve a patient's mental outlook.

Although both users and non-users responded positively toward mental attitude and its benefit toward healing, respondents were clearly divided on their belief of the effectiveness of complementary therapies in conjunction with conventional medicine. Non-users were less convinced that complementary therapies are effective. Although we cannot determine whether patients initially believed in complementary medicine, or whether their experience with complementary medicine convinced them of its utility, patients who use complementary medicine nonetheless believe that the therapies are effective.

Relevant to the question of why patients choose complementary therapies is the question of who is choosing. Previous studies of the general population have exhibited similar demographics among users of complementary medicine—individuals 15 to 20 or 50 to 69 years old, living in the western United States, and having a higher education level than those who did not use

Table V. *Common products and herbs that may affect surgical outcomes*

Product	Effects
Coagulation	
Dehydroepiandrosterone (DHEA)	Interacts with plasminogen activator inhibitor and tissue plasminogen activator
Eicosapentaenoic acid (EPA)	Decreases platelet aggregation
Fish oils	Increases fibrinolysis
Garlic	Inhibits platelet aggregation
Onion	Inhibits platelet aggregation
Vitamin E	Inhibits platelet aggregation
Feverfew	Interacts with warfarin
Ginkgo biloba	Interacts with warfarin
Coenzyme Q ₁₀	Interacts with warfarin
Ginger	Interacts with warfarin
Ginseng	Interacts with warfarin
St John's Wort	Interacts with warfarin
Drug interactions	
Hawthorn berry	Interacts with digoxin
Kyushin	Interacts with digoxin
Licorice	Interacts with digoxin
Plantain	Interacts with digoxin
Uzara root	Interacts with digoxin
Ginseng	Interacts with digoxin
St John's Wort	Interacts with digoxin, warfarin, oral contraceptives, cyclosporin, antiviral drugs
Iron	Affects bioavailability
Hemodynamics	
Caffeine	Hypertension

alternative therapies.^{7,8} However, in our study we found no significant difference in use of complementary medicine on the basis of age, sex, education level, or ethnicity. This fact may reflect biases in our patient population. Unlike the general population, 59% of patients surveyed were educated at a college or technical school level or higher, and all subjects were only English-speaking. With an inadequate number of patients educated at a lower level, we are unable to determine whether patients with cardiac disease truly differ from the general population.

The prevalence of alternative medicine among medically ill patients must serve as a warning sign to health care providers. These patients are often receiving prescription medications, putting them at risk for potential adverse interactions with herbs or high-dose vitamins. Several case reports have highlighted the dangers of herbal medicine. The herb *danshen* has been shown to cause further anticoagulation in patients receiving warfarin.⁹ Moreover, the toxic effects of the herbs or the impurity of the herb preparation might be the cause of serious medical diseases. For example, a case of cardiomyopathy was reportedly linked to the use of an herb for eczema.¹⁰ Given that the use of alternative medicine can have direct effects on the care of patients, the fact that patients are so reluctant to report their use of alternative therapies forces health care providers to

be especially vigilant in pursuing this aspect when taking a history. In the general population, only 38.5% of patients reported alternative therapy use to their physicians. Among patients with cardiac disease, only 17.1% discussed alternative therapy use, with over half of the patients not desiring to discuss the topic with their physicians. This important difference in reporting alternative therapy use demonstrates that patients with serious medical illnesses still consider alternative medicine and conventional medicine separate and distinct. Moreover, patients do not recognize that alternative therapies can have dangerous toxic effects, and physicians must be aware of these adverse effects. In the course of a medical interview, a physician can quickly inquire about herb or alternative therapy use during an evaluation of the patient's current medications.

Some popular herbs can have significant effects on the outcomes of surgical procedures, particularly in the areas of coagulation, drug interactions, and hemodynamics (Table V).¹¹ Regarding coagulation, several herbs have been shown either to directly affect bleeding time or to interact with anticoagulation medications. For example, dehydroepiandrosterone (DHEA) is known to affect plasminogen activator inhibitor and tissue plasminogen activator¹²; eicosapentaenoic acid (EPA) and fish oils are known to affect platelet aggregation¹³ and fibrinolysis.¹⁴ Garlic and onion are known to inhibit platelet aggrega-

tion^{15,16}; vitamin E has effects on platelet function as well.^{17,18} Many products, including feverfew, garlic, ginkgo biloba, coenzyme Q₁₀, ginger, and ginseng interact with warfarin.^{11,19} With regard to drug interactions, products such as hawthorn berry, kyushin, licorice, plantain, uzara root, and ginseng are known to interact with digoxin.¹¹ Iron, an extremely common supplement and medicine, has effects on bioavailability.²⁰ St John's Wort, the popular herb used in depression, may have significant effects on medications such as warfarin, digoxin, oral contraceptives, cyclosporin, and antiviral drugs.^{21,22} Last, the surgeon should be aware that common supplements, such as caffeine, can have significant effects on hemodynamics.²³ Because of the possible effects on surgical outcomes, the American Society of Anesthesiologists has recommended that all herbal therapy be stopped 2 weeks before surgery.²⁴

Patients who have medical conditions use complementary/alternative therapies as often as the general population, demonstrating that this population is not biased in its decision to use complementary medicine. Although our study is limited to patients undergoing cardiothoracic surgery, these data are consistent with findings in other patient populations and may reflect the same attitudes of patients with other serious disease processes; future studies should be undertaken to better characterize the use in other patient populations. As new research expands our understanding of the benefits and dangers of alternative/complementary medicine, physicians and patients must be open in their discussion of complementary/alternative medicine use.

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