Use of Complementary and Alternative Medicine in Inner-City Persons with or at Risk for HIV Infection

Felise B. Milan, M.D.,¹ Julia H. Arnsten, M.D., M.P.H.,¹⁻³ Robert S. Klein, M.D.,^{1,2}
Ellie E. Schoenbaum, M.D.,^{1,2} Galina Moskaleva, M.S.,⁴ Donna Buono, M.S.,²
and Mayris P. Webber, DrPH²

Abstract

Previous studies have shown that use of complementary and alternative medicine (CAM) is prevalent among HIV-infected persons, but have focused primarily on men who have sex with men. To determine factors associated with CAM use in an inner city population, individuals ($n = 93$) recruited from two established cohort studies were interviewed between October and November 2004. The interview assessed the use of dietary supplements and other CAM therapies, reasons for CAM use, and use of prescription medications. Study participants were 52% male and 47% HIV infected. Median age was 50 years, and 60% reported illicit drug use ever. CAM use during the prior 6 months was reported by 94%, with 48% reporting daily use of a dietary supplement. Vitamin C, vitamin E, and soy were used more often by HIV-infected than uninfected persons ($p < 0.05$). Prevention of illness was the most common reason for dietary supplement use (27%). HIV-infected persons were more likely than uninfected persons (95% versus 67%) to report use of both dietary supplements and prescription medications within the past 6 months ($p < 0.001$). In multivariate analysis, HIV infection (odds ratio [OR] 3.1, CI 1.3, 7.7) was the only factor associated with daily dietary supplement use whereas gender, race/ethnicity, working in the last year, homelessness, and financial comfort were not associated. CAM use among persons with or at risk for HIV infection due to drug use or high-risk heterosexual behaviors is common, and is used almost exclusively as an adjunct and not an alternative to conventional health care.

Introduction

THERE IS A GROWING BODY OF LITERATURE demonstrating that the use of dietary supplements and other forms of complementary and alternative medicine (CAM) is common among HIV-infected persons.¹⁻¹¹ Estimates of the prevalence of CAM use among HIV-infected persons range from 40%–80%, which are similar to estimates among persons with other chronic diseases,¹²⁻¹⁵ but higher than estimates of CAM use among persons without chronic disease.¹⁶⁻¹⁹ The variability in estimating CAM use depends, in part, on varying definitions of CAM and which types of therapies are included. The current National Institutes of Health (NIH) definition of CAM is “a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine,”²⁰ and classifies CAM into the following categories: Whole Medical Systems (e.g., homeopathic medicine, naturopathic medicine,

Traditional Chinese Medicine, Ayurveda, and other traditional folk medicine) Mind–Body Medicine (e.g., meditation, prayer, mental healing), Biologically based practices (i.e., dietary supplements, herbal products), Manipulative and Body-Based Practices (i.e., chiropractic or osteopathic manipulation, and massage), and Energy Medicine (e.g., qi gong, Reiki, Therapeutic Touch, and magnetic fields). The list of what is considered to be CAM changes continually, as those therapies that are proven to be safe and effective become adopted into conventional health care, and as new approaches to health care emerge.

In non-HIV-infected persons it has been reported that the majority of persons that use CAM do so as an adjunct or complement to their conventional health care, and not as a substitute or alternative.¹⁸ There is also evidence that some persons with HIV infection use CAM to better cope with their disease, but few use it exclusively as treatment.^{6,9} The strongest predictor of CAM use among one Latino homo-

Departments of ¹Medicine, ²Epidemiology and Population Health, ³Psychiatry and Behavioral Sciences, and ⁴Family and Social Medicine, Albert Einstein College of Medicine, Montefiore Medical Center, Bronx, New York.

sexual HIV-infected sample was use of other prescription medications.²¹ However, while one study found CAM use to be associated with improved adherence to conventional healthcare,²² another found CAM use to be associated with highly active antiretroviral therapy (HAART) nonadherence.²³ There are well-documented adverse drug–drug interactions between some dietary supplements and antiretrovirals^{24,25} as well as many other conventional pharmaceuticals.^{26–28} For example, there is limited evidence that vitamin C (1000 mg/d),²⁹ garlic (equivalent to two 4-g cloves per day),³⁰ and milk thistle³¹ may interact with protease inhibitors, and St. John's wort has been shown to reduce indinavir levels.³² Knowledge of potential herb–drug interactions was shown to be poor in one cohort of HIV-positive men in Canada.³³

To date, studies of CAM use among HIV-infected persons have focused primarily on men who have sex with men (MSM), have included few persons who acquired HIV through injection drug use (IDU), or high-risk heterosexual behavior,^{2,3,11,21,34} or have compared study participants to the general population rather than to a comparison group with similar demographic or behavioral characteristics. Age and CD4 count have not been consistently associated with CAM use.^{2,3,4,5,10,11} Participants in these studies have tended to be younger than 50 years old, white, well-educated and with high incomes, and results have shown that CAM use is most prevalent among men, whites, and those with higher educational achievement and incomes.¹¹ The objectives of this study were to determine the prevalence of and factors associated with CAM use in a middle-aged inner-city sample of heterosexual women and men, and to compare CAM use by gender, HIV risk history, and HIV serostatus.

Methods

Study participants

Participants were women and men with or at risk for HIV infection enrolled in two longitudinal cohort studies at Montefiore Medical Center in the Bronx, New York. Women enrolled in the Menopause study (Ms) and men enrolled in the Cohort of HIV At-risk Men's Prospective Study (CHAMPS) were invited to participate in a substudy of factors associated with CAM use. Participant recruitment and study design for both studies have been described previously.^{35,36} In brief, Ms-enrolled women aged 35–50 years between September 2001 and July 2003. CHAMPS enrolled men aged 49 years and older between August 2002 and December 2003. Recruitment for both cohorts was from methadone maintenance clinics, primary care clinics, community newsletters, health fairs, word-of-mouth, and a prior research cohort. Ms and CHAMPS shared similar methodology and data collection tools so that the outcomes of interest could be compared by gender. By design, approximately 50% of each cohort was HIV-infected. Within each HIV serostatus group approximately 50% had a history of drug use (defined as ever having injected drugs, or having used crack, heroin, cocaine, or methadone within the prior 5 years), and 50% had a history of sexual risk behaviors (defined as five or more sexual partners within the prior 5 years, exchanging sex for money or drugs, or ever having sex with an injection drug user or a partner known or suspected of having HIV infection). For HIV-infected persons, self-reported data on antiretroviral

regimen and adherence were also collected. In analyses for this manuscript we excluded information from men who indicated sex with other men as their HIV risk.

CAM Substudy interview

The current analysis includes data from consecutive persons interviewed for the CAM Substudy between October 27, 2004 and November 16, 2004, during their usual semi-annual Ms or CHAMPS study visit. During this period additional questions on CAM use were administered using an instrument developed by the authors based on a literature review to determine the most common CAM modalities and dietary supplements being used in the United States,^{17,37} and pilot tested in 10 cohort members prior to implementation. The CAM Substudy was approved by the Institutional Review Board for the Protection of Human Subjects of Montefiore Medical Center. All participants provided written informed consent and were reimbursed an extra \$10 for CAM Substudy participation.

The CAM Substudy interview was a face-to-face, standardized interview administered by trained research staff. It included questions on demographic characteristics, antiretroviral regimens, use of other medical care (including prescription medications), and use, in the past 6 and past 12 months, of 31 specified dietary supplements (i.e., vitamins, herbs, minerals, soy, green tea) plus up to 3 nonspecified dietary supplements reported by the interviewee. For each item reportedly taken in the past 6 months, five additional questions were asked: (1) how often was the dietary supplement taken, using a five-point scale (from every day to less than one time per month); (2) was the dietary supplement being taken now; (3) what was the most important reason (from among five choices: energy increase, muscle strength, illness prevention, stress reduction, medication side effects reduction, or other); (4) was it taken as treatment for HIV, hepatitis C, diabetes, asthma, heart disease, depression, or other illness; and (5) was it sometimes substituted for regular medicine. Questions were also asked about use in the last 6 months of 14 alternative treatment modalities, such as spiritual and folk remedies, relaxation techniques, or acupuncture.

Data analysis

First, characteristics of CAM Substudy participants were compared to the parent cohorts, and within the CAM Substudy cohort, compared by gender and HIV-status. Means of continuous variables were compared using Student's *t* test and associations between categorical variables were analyzed using χ^2 tests. Then, frequencies of use of dietary supplements in the prior 6 months were calculated and compared by gender and HIV status. Finally, multiple logistic regression models were used to evaluate independent associations between participant characteristics (gender, race/ethnicity) and daily dietary supplement use. A separate model was constructed for HIV-infected persons to examine the effects of age, gender, and CD4 cell count on daily dietary supplement use. To investigate whether persons with lower CD4 counts were more likely to use daily dietary supplements, an additional multivariate model including only HIV-infected persons with a CD4 count within the past 6 months ($n = 60$) was constructed.

Variables that were significant at $p \leq 0.05$ were included in multivariate logistic regression models using SAS statistical software version 9.1 (SAS Institute Inc., Cary, NC) to produce adjusted odds ratios (OR) and 95% confidence intervals (95% CI).

Results

Demographic characteristics of study participants

Of 131 persons interviewed in Ms or CHAMPS during the period the CAM Substudy was active, 94% (123/131) participated in the CAM Substudy. Thirty men citing sex with other men as their HIV risk factor were excluded. The mean age ($\pm$ standard deviation [SD]) ages of CAM Substudy participants ($n = 93$) were 45.3 (± 4.4) and 54.5 (± 4.1) years for women and men, respectively ($p < 0.01$) due to the recruitment designs of Ms and CHAMPS. CAM Substudy participants were mostly non-white and likely to be unemployed. 60% reported illicit drug use within 5 years, of whom 11% reported IDU (Table 1). Compared to the combined total Ms and CHAMPS cohorts, CAM Substudy participants were similar in age (mean, 50.1 versus 49.7 years, $p = \text{ns}$). They reported more high-risk sexual behavior (86% versus 77%, $p < 0.05$) than the combined parent cohorts and similar rates of injection drug use (47% versus 50%, $p = \text{ns}$). There were no other significant differences between CAM Substudy participants and participants in the parent Ms and CHAMPS studies.

HIV disease and risk factors

Risk factors for HIV infection among CAM Substudy participants differed by gender; women were more likely to report high-risk sexual behaviors and men were more likely to report injection drug use. Injection drug use was the only HIV risk factor for 6.5% of CAM Substudy participants, 45% had a history of high-risk sexual behaviors, and 41% reported both IDU and high-risk sex (Table 1). HIV-infected persons were similar to uninfected persons in age, education, and il-

licit drug use, but were more likely to be Black (OR 3.8 95% CI 1.6, 9.5). The median CD4 count among HIV-infected persons was 380 (range, 130–964); 4 participants had a CD4 below 200, and 12 participants had a CD4 above 500.

Use of dietary supplements

Dietary supplement use in the last 12 months was reported by 73% of participants, and use in the last 6 months by 67%. Daily dietary supplement use in this latter group was 48%. Most commonly reported dietary supplements used in the last 6 months were green tea (42%), vitamin C (37%), vitamin E (20%), soy (14%), and ginseng (18%). The most common reasons for supplement use were illness prevention or to boost immunity (27%), to increase energy (24%), or to cleanse the body or treat the toxic effects of medications (8%). Overall reasons for use did not vary significantly by HIV serostatus; boosting immunity was cited as a reason more than often in those with HIV infection (41/148; 27.7%) compared to those without HIV infection (19/101; 18.8%) but the difference did not achieve statistical significance (OR 1.65, 95% CI 0.86–3.21; $p = 0.14$).

Vitamin C, vitamin E, and soy were used significantly more often in the last 6 months by HIV-infected than uninfected persons (Table 2). In bivariate analyses, use of dietary supplements in the last 6 months was associated with Black race (OR 2.7, 95% CI 1.1, 6.7) but not with HIV infection, age, gender, education, employment, or the ability to pay for necessities.

In a multivariate logistic regression analysis, daily dietary supplement use was associated only with HIV infection (OR = 3.1, CI 1.3, 7.7), but not with age, gender, race, educational level, homelessness, working outside the home, or ability to pay for necessities. In the model using only HIV-infected persons with a CD4 count within the past 6 months ($n = 44$), daily dietary supplement use was associated with being female (OR 5.3, CI 1.1, 25.3) and working outside of the home in the last 6 months (OR 8.8, CI 1.2, 64.9), but there was no association with CD4 count or other factors includ-

TABLE 1. CHARACTERISTICS OF COMPLEMENTARY AND ALTERNATIVE MEDICINE SUBSTUDY PARTICIPANTS BY GENDER ($n = 93$)

Characteristic	Men $n = 48$ (%)	Women $n = 45$ (%)
Mean age years ($\pm$ SD) ^a	54.5 (± 4.1)	45.3 (± 4.4)
Race		
Black	33 (69)	19 (42)
Hispanic	7 (15)	16 (36)
White	6 (13)	7 (16)
Other	2 (4)	3 (7)
HIV-infected	26 (54)	19 (42)
Education (high school graduate/GED)	27 (56)	25 (56)
Worked > 20 hrs/wk in past 6 months	11 (23)	12 (27)
Finds it hard to pay for basics	38 (79)	32 (71)
HIV risk behaviors		
IDU only	5 (10)	1 (2)
Risky heterosexual sex ^a	16 (33)	26 (58)
IDU and risky heterosexual sex ^a	25 (52)	13 (29)
Any illicit drug use	33 (69)	23 (51)

^a $p < 0.05$.

IDU, injection drug use; SD, standard deviation.

TABLE 2. DIETARY SUPPLEMENT USE (PAST SIX MONTHS) BY HIV STATUS ($n = 93$)

Dietary supplement	HIV-infected $n = 44$ (%)	HIV-uninfected $n = 49$ (%)	p value
Green Tea	21 (48)	18 (37)	$p = 0.28$
Vitamin C	21 (48)	13 (27)	$p = 0.03$
Vitamin E	13 (30)	6 (12)	$p = 0.04$
Soy	10 (23)	3 (6)	$p = 0.02$
Ginseng	8 (18)	9 (18)	$p = 0.98$

ing age, race, educational level, homelessness, or ability to pay for necessities.

Use of other CAM therapies

CAM use other than dietary supplements in the past 6 months was reported by 87% of participants (Table 3). By far, the most common therapy reported was prayer. In bivariate analyses by gender, the only specific CAM modality associated with female gender was folk remedies ($p = 0.04$). In bivariate analyses by HIV status, HIV-infected persons were more likely than uninfected persons to use of acupuncture ($p < 0.0001$).

CAM and conventional health care

CAM was used by the majority of participants as an adjunct and not an alternative to conventional health care. Although 94% of CAM Substudy participants reported using some form of CAM, no one reported using CAM instead of a dose of their prescription medications, either HIV-related or non-HIV-related. The majority of individuals (82%) used both CAM and prescription medications. Only 12% used CAM exclusively, while 5% used prescription medications without CAM and 1% used neither CAM nor prescription medications. The pattern of use differed significantly by HIV

serostatus, with 95% of those with HIV infection and 67% of those without HIV infection using both CAM and prescription medications ($p < 0.001$). Reported use of dietary supplements showed a similar association with HIV status; 75% of those with and 43% of those without HIV infection had used both dietary supplements and prescription medications within the past 6 months ($p = 0.002$).

Discussion

In this study of inner-city, middle-aged, heterosexual men and women with or at risk for HIV infection, CAM use, including dietary supplements, was reported by more than 90% of participants in the prior 6 months. Vitamins C and E, green tea, soy, and ginseng were the most commonly used dietary supplements, and prayer, relaxation techniques, massage, self-help groups, and acupuncture were the most commonly used CAM therapeutic modalities. Since both HIV-infected and HIV-uninfected persons with similar demographic and behavioral characteristics were included, we were able to assess the association of HIV infection with CAM use. While overall CAM use was similar in HIV-infected and -uninfected individuals, daily dietary supplement use was about three times more likely in those with HIV infection. As previously reported, CAM use was reported by participants as being used as an adjunct to and not a substitute for conventional prescription medication.

Most prior reports of CAM use in HIV-infected persons have included predominantly highly educated men who have sex with men.^{1,2,3,6,9,11,21,32,38} While prior studies have shown CAM use to be associated with higher incomes and education,^{3,11,16,17} we found very high rates of CAM use in a disadvantaged minority population, similar to the 50%–90% previously reported in persons with HIV infection.^{4,7} These results suggest that CAM use may be higher than previously recognized in urban populations.

The few studies of CAM use that have included a substantial number of women and/or heterosexual men have found greater CAM use among women than men in both HIV-infected^{4,5,10} and HIV-uninfected populations.^{16,17} In the present study, although women reported similar rates of dietary supplement use as men, those with HIV infection reported significantly more daily dietary supplement use and more use of folk remedies.

The use of prayer in this study was reported by more than three quarters of participants, a higher prevalence than has been found in other studies that have assessed prayer as an alternative therapy, but consistent with a study by Cotton et al.³⁹ that used several measures to evaluate participation in religious/spiritual activities in persons with HIV/AIDS.^{2,4,6,7}

TABLE 3. COMPLEMENTARY AND ALTERNATIVE MEDICINE THERAPIES (OTHER THAN DIETARY SUPPLEMENTS) USED IN THE LAST SIX MONTHS

CAM Therapy	n (%)
Any CAM Therapy	81 (87)
Prayer	71 (76)
Relaxation techniques	37 (40)
Massage	24 (26)
Self help group	29 (31)
Acupuncture	17 (18)
Diet (not for weight loss)	13 (14)
Folk remedies	12 (13)
Energy healing	10 (11)
Spiritual healing	9 (10)
Chiropractic	4 (4)
Imagery	4 (4)
Hypnosis	2 (2)
Homeopathy	2 (2)
Biofeedback	1 (1)
Other:	12 (13)
Meditation/deep breathing	

CAM, complementary and alternative medicine.

A previous study of 2266 HIV-infected persons reported that being more religious and spiritual was associated with being older, non-white and female.⁴⁰ The high rate of prayer reported in our study also may be due to the fact that we listed prayer and spiritual healing as separate CAM therapeutic modalities, so that affirmative responses for prayer may represent use for purposes other than specifically related to health. Other studies with younger samples have reported prayer rates of 20%–50%, using terms such as religious healing,^{4,7} prayer therapy,² or spiritual healing⁶ whereas in the present study only 10% reported use of spiritual healing. An increase in spirituality/religiosity has been observed after HIV diagnosis and associated with a slower disease progression and increased survival.^{42,43} While religious practices and spiritual beliefs may represent a coping strategy for those with HIV infection, there is some evidence that religiosity may also contribute to stigma and self-blame for those ostracized from their religious institutions.^{41,44,45} The use of prayer in HIV infection needs to be studied further to fully understand its role.

Dietary supplement use was also common in our study. Prior studies have reported rates of herb and vitamin use of 20%–30%,^{2,10,46} and 29%–57%,^{3,5,7,46} respectively; however, they did not report rates for specific herb and vitamin use. Other studies of vitamin C use found rates comparable to those we reported.⁹ Reasons for dietary supplement use previously reported in HIV-infected persons were primarily to boost immunity or treat medication side effects.^{3,10,46} Vitamin C has been widely promoted for boosting the immune system,⁴⁷ and multivitamin use has been supported by some as a treatment for HIV infection with limited evidence to support either.^{48,49} Prior studies also reported that the CAM used most often by those with HIV infection was vitamins.^{3,7,9} Given new reports of possible interactions of vitamin C with protease inhibitors,²⁹ advising patients taking antiretroviral treatment about these possible interactions is important.

Many studies report that CAM is largely used as an adjunct to and not a substitute for conventional medical care, consistent with the findings reported here. Druss and Rosenheck¹⁸ found that the strongest predictor of greater CAM use was more frequent doctor visits. This is especially true in chronic diseases like HIV infection.^{20,21} In our study, a majority of individuals reported taking dietary supplements in addition to prescription medications, which should remind providers of the importance of asking all patients about CAM use.

In summary, CAM use among middle-aged, heterosexual, inner-city residents with or at risk for HIV is common but is used largely as an adjunct to rather than as an alternative to conventional healthcare. Further research is needed to determine how health care providers can best advise patients to safely integrate dietary supplements and other CAM modalities into their health care.

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Address reprint requests to:
 Felise B. Milan, M.D.
 Residency Program in Social Medicine
 Montefiore Medical Center
 3544 Jerome Avenue
 Bronx, NY 10467

E-mail: fmilan@montefiore.org