

Alternative Therapies Among Adults With a Reported Diagnosis of Asthma or Rhinosinusitis*

Data From a Population-Based Survey

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Background: Asthma and rhinosinusitis are common medical conditions among adults. Alternative treatments could have important impacts on health status among those individuals with these conditions, but specific prevalence data for these treatments are limited.

Objective: To estimate the prevalence of specific alternative treatment modalities, including herbal agents, ingestion of caffeinated beverages, homeopathy, acupuncture, and massage therapies.

Design: Random population telephone sample.

Setting: Northern California.

Participants: Three hundred adults aged 18 to 50 years with self-report of a physician diagnosis of asthma (n = 125) or rhinosinusitis without concomitant asthma (n = 175).

Measurements: Structured telephone interviews covering demographics and clinical variables, including the following alternative treatments used in the previous 12 months: herbal agents; caffeine-containing products; homeopathy; acupuncture; aromatherapy; reflexology; and massage.

Results: Any alternative practice was reported by 127 subjects (42%; 95% confidence interval [CI], 36 to 48%). Of these, 33 subjects (26%; 95% CI, 21 to 31%) were not current prescription medication users. Herbal use was reported by 72 subjects (24%), caffeine treatment by 54 subjects (18%), and other alternative treatments by 66 subjects (22%). Taking into account demographic variables, subjects with asthma were more likely than those with rhinitis alone to report caffeine self-treatment for their condition (odds ratio, 2.5; 95% CI, 1.4 to 4.8%), but herbal use and other alternative treatments did not differ significantly by condition group.

Conclusion: Alternative treatments are frequent among adults with asthma or rhinosinusitis and should be taken into account by health-care providers and public health and policy analysts.

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Key words: alternative therapy; asthma; complementary; herbal; rhinitis

Abbreviations: CI = confidence interval; OR = odds ratio; SF-12 = 12-question version of the short-form health status battery

The use of alternative therapies to treat health conditions has gained increasing attention from both patients and health-care providers.^{1,2} Asthma

and rhinosinusitis are particularly relevant conditions in which to assess the prevalence of such practices, which are also referred to as “complementary” or “unorthodox” therapies.³⁻⁵ Asthma and rhinosinusitis

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are common and chronic conditions, affecting a wide age range of persons with heterogeneous demographic characteristics and manifesting a broad spectrum of disease severity. There is also a diverse array of prescribed and over-the-counter treatment options available.

Alternative treatments for asthma and rhinosinusitis have important potential impacts on health sta-

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tus. Such impacts on health status may be direct, such as beneficial pharmacologic mechanisms or adverse side effects. The impacts of alternative therapies also may be indirect, working through patient-perceived disease control or resulting in the deferral or interruption of prescription medication or other traditional treatment strategies. Because data delineating the patterns and correlates of alternative therapy use in patients with asthma and rhinosinusitis are limited, it is difficult to gauge the potential magnitude of their health impact. We do not know which patient populations are most likely to use specific alternative treatment modalities, nor do we know how these modalities might relate to condition type or severity.

In order to estimate the frequency of alternative treatment use, we analyzed data from a population-based, random telephone sample of adults in Northern California who reported a physician's diagnosis of asthma or rhinosinusitis in a screening questionnaire. We examined a number of specific treatment modalities, including herbal remedies, ingestion of caffeinated beverages, homeopathy, acupuncture, aromatherapy, and massage therapies.

MATERIALS AND METHODS

Overview

We analyzed survey responses to telephone interviews carried out in a population-based sample identified by random-digit dialing. We used screening questions to identify eligible subjects based on age (18 to 50 years) and a reported physician's diagnosis of asthma or rhinosinusitis, excluding those subjects who reported emphysema. Structured telephone interviews assessed demographic characteristics, health status, and treatments, including both traditional and alternative modalities. The study was performed with the approval of the Committee on Human Research of the University of California, San Francisco.

Subject Selection

Details of subject selection have been reported previously.⁶ In brief, random-digit dialing and interviewing were conducted (Field Research Corporation; San Francisco, CA) during an 8-week period in the late spring and early summer of 1999. Sampling was limited to Northern California, based on telephone area codes and prefixes. Calls were made during the afternoons, evenings, and weekends with up to six attempts before a potential interviewee was considered to be a nonresponder. Interviews were limited to respondents between the ages of 18 and 50 years, with only one subject per household interviewed. Subjects who spoke Spanish had the option of being interviewed in Spanish. We excluded subjects who did not speak either English or Spanish.

Health Condition Definitions

We defined subjects as having asthma if they reported receiving a diagnosis of this condition from a physician (*ie*, a current or

prior diagnosis). We defined the rhinosinusitis group of conditions by a report of a physician's current or prior diagnosis of allergic rhinitis, sinusitis, hay fever, or chronic postnasal drip, but without a concomitant diagnosis of asthma. Interviewers probed for all of these conditions. Those subjects categorized into the asthma group, by study definition also could have concomitant rhinosinusitis.

Recruitment

We set a recruitment target of 125 subjects with asthma (with or without a concomitant nasal condition) and 175 with rhinosinusitis alone. Screening interviews were completed for 3,666 individuals, yielding 455 persons within the age range and reporting the conditions of interest. The 125 participating subjects with asthma represent 68% of the 183 eligible subjects identified. The 175 with rhinosinusitis comprise 64% of 272 eligible subjects identified. The target recruitment for rhinosinusitis (a more common condition) was achieved more rapidly, with additional screening calls made to identify persons with asthma. Thus, of 97 with rhinosinusitis eligible but not interviewed, only 86 formally declined to be interviewed.

Interview Content

The survey structure was parallel, but not identical, for the subjects in the group with asthma (with or without concomitant rhinosinusitis) compared to the subjects with rhinosinusitis alone. Where appropriate for the rhinosinusitis group, "nasal condition" was substituted for "asthma" in some condition-specific questions. We ascertained subject self-assessed condition severity by asking, "How severe do you believe your asthma is? [nasal or sinus symptoms are?]" with response options of severe, moderate, mild, or asymptomatic. We also administered a 12-question version of the short-form health status battery (SF-12).^{7,8} Both groups were asked about respiratory and nasal medications (*ie*, prescription, over-the-counter, and alternative therapies).

In regard to alternative treatments, we introduced a series of items by stating "Now I am going to ask you about some less traditional or alternative treatments for a breathing or nasal problem that you may have used in the past 12 months." The specific terms we used were "herbal pills, capsules, or herbal tea treatment," "black coffee or black teas specifically to treat breathing or nasal symptoms," and "other caffeine products for this reason, such as cola, other caffeinated soda, mate tea or guarana." For those subjects reporting the use of herbs, we probed in greater detail using a list of teas potentially containing ephedra, including common brand names of such teas and, separately, elicited a response on the generic use of Chinese herbs. In addition, we asked about "alternative types of treatments, specifically for breathing or nasal symptoms" following with probes for the following: "homeopathic medicine"; "acupuncture"; "aromatherapy"; "reflexology"; "shiatsu"; and "other massage." We included "acupuncturist or acupressurist," "homeopathy practitioner," "spiritual healer," and "massage therapist" among health-care providers listed.

Statistical Analysis

We calculated the 95% confidence intervals (CIs) for observed proportions assuming a normal distribution. We compared the frequency of alternative treatment among persons with asthma to those with rhinosinusitis using the χ^2 test. We also used the χ^2 to test the associations among the different alternative treatments and between them and the self-assessed severity of the subject's condition. We calculated the SF-12 summary scores for physical

and mental health using a standard approach that is designed to yield normative population mean values of 53 and 49.5, respectively.^{7,8} We tested differences in score by alternative practice type using the *t* test. We used logistic regression analysis to ascertain the impact of diagnosis and demographic characteristics on alternative treatment use (regardless of recent prescription medication use or as predominant therapy). The model we defined *a priori* included asthma, age, gender, race, and ethnicity (*ie*, black, non-Hispanic or Hispanic; all others [*ie*, the referent]), education (*ie*, high school or less, some college, or college graduate), and annual household income < \$20,000 (*ie*, approximately 125% of the federal poverty level for a family of four or more).

RESULTS

Demographics

Subject demographics are shown in Table 1. More than two thirds of the subjects interviewed were women, and more than three quarters of the subjects reported at least some college education. Twenty percent of subjects were Hispanic or black. The mean (\pm SD) age of subjects was 36 ± 9 years. Forty-eight subjects (16%) reported an annual household income of < \$20,000. Lower income was the only one of these demographic variables to differ significantly by diagnostic group. Of 125 subjects with asthma (with or without concomitant rhinosinusitis), 31 subjects (25%) reported a family income of < \$20,000 compared to 17 subjects (10%) among those with rhinosinusitis alone ($p < 0.001$).

Alternative Treatment Frequencies

Alternative treatment use was frequent, with 42% (95% CI, 36 to 48%) reporting any such practice to treat breathing or nasal symptoms in the 12 months prior to the interview (Table 2). As a category, herbal

Table 1—Characteristics of 300 Study Subjects, of Whom 125 Reported Asthma With or Without Rhinosinusitis and 175 Reported Rhinosinusitis Alone*

Characteristics	No.	%	95% CI, %
Female gender	207	69	64–74
Race and ethnicity			
Black, non-Hispanic	12	4	2–6
Hispanic	49	16	12–20
All others	239	80	75–84
Education			
\leq High school	68	23	18–27
Some college	106	35	30–41
College graduate	126	42	36–48
Annual household income < \$20,000	48	16	12–20

*Of 125 subjects with asthma, 72 (58%) also reported one or more rhinitis or sinus condition. Eighteen subjects not stating their income were treated as earning \geq \$20,000 annually. Two subjects not stating their race were included in the category of "all others." Asians comprised < 7% of "all others."

treatments were the most common, reported by 24% of subjects overall. Of 72 subjects using herbal treatments, 30 (42%) specifically identified ephedra-containing products. There were no statistical differences in the frequency of herbal use, overall or by subcategories, among those with asthma compared to those with rhinosinusitis. This was also true for homeopathy, acupuncture, and aromatherapy and other forms of massage. In contrast, the use of caffeine-containing beverages specifically as a treatment for breathing or nasal symptoms was more than twice as frequent among those subjects with asthma than among those with rhinitis alone (Table 2).

There was a tendency for people who used one type of alternative treatment to also use another. Of the 72 subjects reporting herb use, 34 (47%) used homeopathy, acupuncture, aromatherapy, or massage compared to only 14% of those not using herbs ($p < 0.001$) [data not in Table 2]. Although a smaller proportion of the herbal users also reported caffeine treatment (35%), this use was nonetheless more frequent than among the nonusers of herbs (13%) ($p < 0.001$). The overlap was less marked for users of homeopathy, acupuncture, aromatherapy, or massage, among whom 33% were also caffeine users, compared to 20% of all others ($p = 0.04$).

Only two subjects listed an acupuncturist, homeopath, or massage therapist as their principal asthma-care provider in the past 12 months. We did not specifically query about chiropractic treatment for asthma or a nasal condition.

Self-Assessed Condition Severity, Health Status, and Alternative Treatment

Among adults with asthma or rhinosinusitis overall, self-assessed severity was not statistically associated with alternative treatment use for any of the three categories of practices that we analyzed. Among 299 subjects, there were 46 (15%) (data missing for 1 respondent) who classified their condition as being either moderate or severe rather than mild or asymptomatic. There was no association between self-assessed disease severity and herbal use (24% of herbal users in each group). The frequencies also were similar, by severity category, for caffeine use (15% among those with self-rated moderate to severe disease; 18% for those with self-rated mild or asymptomatic disease). Although the use of homeopathy and other alternative therapies was more frequent among those subjects with greater self-assessed disease severity (30%) compared to those with mild or asymptomatic disease (21%), this difference was not statistically significant ($p = 0.20$). Stratifying by condition (asthma vs rhinosinusitis) did not meaningfully strengthen this association.

Table 2—Frequency of Reported Alternative Treatments During the Previous 12 Months*

Treatment Type	Asthma (n = 125)	Rhinosinusitis (n = 175)	All (n = 300)	
	No. (%)	No. (%)	No. (%)	95% CI, %
Any herbal	26 (21)	46 (26)	72 (24)	19–29
Ephedra products	14 (11)	16 (9)	30 (10)	7–13
Chinese herbs	11 (9)	19 (11)	30 (10)	7–13
Any caffeine	33 (26)	21 (12)†	54 (18)	14–22
Black tea or coffee	26 (21)	16 (9)†	42 (14)	10–18
Other caffeine product	14 (11)	10 (6)	24 (8)	5–11
Other alternatives	26 (21)	40 (23)	66 (22)	17–27
Homeopathy	11 (9)	10 (11)	31 (10)	7–13
Acupuncture	6 (5)	9 (5)	15 (5)	3–7
Aromatherapy, reflexology, massage	18 (14)	26 (15)	44 (15)	11–19
Any alternative	52 (42)	75 (43)	127 (42)	36–48

*“Chinese herbs” also may include ephedra. Other specific subcategories of herbs were not elicited. Categories and subcategories are not mutually exclusive and may overlap.

†p < 0.01 (rhinosinusitis compared to asthma group).

We also examined the association between alternative practices and self-reported physical and mental health status based on the SF-12 summary scores (data were missing for seven subjects, of whom two were herbal users and one subject was in the homeopathy and other practices category). The mean SF-12 physical summary score was significantly lower for herbal users (46.1 ± 10.1) compared to nonusers (48.9 ± 9.3 ; $p = 0.03$). The differences were of a similar magnitude for caffeine use (mean difference, 2.8 points) and other practices (mean difference, 2.5 points), but in both cases did not exclude the no-effect level at a 95% confidence level (caffeine use, $p = 0.05$; other practices, $p = 0.07$). In contrast, SF-12 mental health summary scores differed little by herbal use (49.1 ± 10.6 vs 48.7 ± 10.1 ; $p > 0.7$) or by caffeine self-treatment (49.1 ± 10.2 vs 48.1 ± 11.7 ; $p > 0.5$) but were statistically lower among those reporting homeopathic or other prac-

tices (45.8 ± 11.1) compared to all others (49.9 ± 10.2 ; $p = 0.005$), regardless of health condition type.

Demographic and Condition Factors Associated With Specific Alternative Practices

Even after taking demographic characteristics into account in a multiple logistic regression analysis, persons with asthma were more likely to use caffeine as a treatment (odds ratio [OR], 2.5; 95% CI, 1.4 to 4.8) [Table 3]. There were no other statistically significant condition-associated factors associated with alternative treatment use, comparing asthma to rhinosinusitis alone. There were, however, several demographic associations that differed by treatment type. Hispanic subjects and those with low annual household incomes (<\$20,000) were less likely to report herbal use. Women were more likely to report

Table 3—Factors Associated With Alternative Treatment (Multiple Logistic Regression Analysis)

Risk Factor	Herbal Use		Caffeine Use		Other Treatment*	
	OR	95% CI	OR	95% CI	OR	95% CI
Asthma (rhinosinusitis alone = referent)	0.8	0.4–1.4	2.5	1.4–4.8	1.0	0.6–1.8
Race/Ethnicity (all others = referent)						
Black, non-Hispanic	2.5	0.7–9.0	0.3	0.03–2.0	0.3	0.04–2.4
Hispanic	0.4	0.1–0.97	0.6	0.3–1.6	0.7	0.3–1.7
Education (college graduate or greater = referent)						
High school or less	0.9	0.4–2.1	1.5	0.6–3.7	1.0	0.4–2.2
Some college	1.7	0.9–3.2	1.8	0.8–3.7	1.7	0.9–3.3
Annual household income < \$10,000	0.2	0.1–0.8	1.0	0.4–2.4	0.8	0.3–1.8
Age (per 10 years)	1.0	0.7–1.4	0.7	0.5–1.01	1.1	0.8–1.5
Female gender	0.7	0.4–1.1	0.8	0.4–1.6	2.0	1.03–4.0

*“Other Treatment” category includes homeopathy, acupuncture, aromatherapy, reflexology, or other massage therapy.

alternative treatments including homeopathy, acupuncture, and massage. Younger age was associated with a greater likelihood of self-treatment with caffeine, although the CI of the risk estimate included no association (OR, 0.7 per 10 years of increased age; 95% CI, 0.5 to 1.01). We did not adjust for insurance status in these models, given that only 26 subjects (12%) lacked health-care coverage. Furthermore, there was no statistical association between a lack of insurance and any of the types of alternative therapy used ($p > 0.7$ for herbal use, caffeine use, or other alternative treatment use).

Exclusive Uses of Alternative Therapy

We identified subjects who reported any prescription medication (*ie*, inhalers, sprays, or oral medications) use for asthma or rhinitis in the 2 weeks prior to the interview. Altogether, 212 subjects (71%) reported such prescription use. Of the 72 subjects reporting herbal use (in the previous 12 months), 22 (31%) were not recent prescription medication users. Of 54 caffeine users, 10 (19%) were not recent prescription users, and of 66 persons reporting other alternative practices, 18 (27%) were not recent prescription users. Altogether, of the 127 subjects reporting any alternative practice, 33 (26%; 95% CI, 21 to 31%) were not currently using prescription treatments. None of the demographic variables that we studied were statistically associated with exclusive alternative treatment in logistic regression analysis. Including condition (asthma vs rhinosinusitis) or self-assessed disease severity added little additional explanatory power to the model.

DISCUSSION

Our findings indicate that alternative treatments are even more common among adults with asthma or rhinosinusitis than previous estimates have suggested. These are common health conditions with a combined prevalence, based on US National Health Interview Survey⁹ estimates, of approximately one quarter to one third of the adult population who are aged 18 to 44 years. Therefore, the contribution of frequent use in such a large subset of the population suggests that these practices are more widespread than may be generally appreciated.

One of the most widely cited population-based estimates of alternative treatment prevalence was generated by a national study of 1,539 adults that was carried out in 1991.¹ This study, which also used random-digit-dial telephone interviews but was not limited to those subjects with asthma or rhinosinusitis, found that 34% of subjects overall reported the use of some form of "unconventional therapy" in the

prior 12 months. This prevalence, however, was driven by the use of relaxation techniques (13%) and chiropractic therapy (10%). In that study, herbal use was reported by only 3% of subjects, massage therapy by 7% of subjects, and acupuncture by < 1% of subjects. Although not limited to a specific condition, 16% of subjects reported allergies and, of those, only 9% reported the use of an unconventional therapy, with the most common ones being spiritual healing and lifestyle or diet interventions. Among all those subjects with pulmonary problems (which may have included, but was not limited to, asthma), 11% reported some unconventional therapy.

Asthma-specific data for alternative practices in the United States are limited. Three separate studies from Oregon and California provide estimates that are relevant to the current study. Among 82 subjects from Oregon with subject-reported, physician-diagnosed asthma who were interviewed in 1991 as part of the multicountry European Community Respiratory Health Survey,¹⁰ three persons (4%) reported using alternative remedies for their condition in the previous 12 months. In another study^{11,12} of adults with physician-diagnosed asthma in Northern California, of the 482 subjects who were initially interviewed between 1993 and 1994, the 12-month prevalence was 8% for herbal treatment (3% in an ephedra-herbal subgroup) and 6% for self-treatment with caffeinated coffee or tea. A third study,¹³ limited to 50 adults with self-reported asthma who had been recruited by public local advertisement in the San Francisco Bay Area in 1995, found that 32% of subjects reported ever using either herbal tea or caffeinated coffee or tea to treat their condition. That study, which included some subjects who relied solely on over-the-counter asthma medications, found that herbal/caffeine use was no more common than among those subjects who were also using prescription medications.

Data from the United Kingdom, which may be comparable to data from the United States, found only 3% alternative therapy use among 373 subjects with a self-reported physician diagnosis of asthma who had been recruited for the European Community Respiratory Health Survey from 1990 to 1992.¹⁰ In contrast, a more recent mail-back survey¹⁴ in the United Kingdom of 4,741 asthmatic patients (24% response rate) that was carried out in 1997 reported a cumulative lifetime prevalence of 11% for herbal treatment, 7% for acupuncture, and 1% each for reflexology and acupuncture.

Estimates for alternative treatment for subjects with rhinosinusitis are even more limited than those for subjects with asthma. A clinical series¹⁵ of 120 adult patients who were evaluated by a community-based otolaryngology practice in Florida found that

alternative treatments were quite common. Overall, 29% reported using herbal therapy, 19% reported using acupuncture, and 35% reported using chiropractic treatment for their condition. A report of past nasal sinus surgery was statistically associated with a greater likelihood of use of alternative therapies. All of these studies, taken as a group, indicate that alternative treatment use among adults with asthma or rhinosinusitis may be quite common. Moreover, the temporal trend in estimates over the past 10 years suggests that the prevalence of such treatment is rising.

Our data provide important insights into demographic factors associated with alternative treatment usage when examined on a condition-specific and treatment-specific basis. For example, although income and ethnicity were strongly and independently linked to herbal treatment, neither manifested a statistical association with the other alternative treatments that we studied. Educational attainment, contrary to expectation, did not demonstrate a clear-cut relationship to alternative practices. Subjects with some college education appeared to be the most likely to report alternative therapy use relative to college graduates, although CIs for these associations were wide and did not exclude 1.0 (*ie*, no effect). Two large general studies^{1,2} (which were not condition-specific or treatment-specific) have found an association between higher education and more frequent use of alternative treatment. In contrast, neither of those studies identified the female gender association with specific alternative therapy practices that we observed.

The potential limitations in our study should be kept in view. We defined asthma and rhinosinusitis based on subject reports of a physician diagnosis, a commonly used epidemiologic approach. Nonetheless, we did not have confirmatory medical record data or results of pulmonary function or aeroallergen testing. If these conditions were misreported, this could affect our estimate of alternative treatment use prevalence. We did not observe an association between perceived condition severity and alternative therapy use, the argument there being that a population more troubled by their illness would not have yielded substantially different results.

The population of Northern California may differ from that of other US regions in terms of disease patterns, demographic mix, and local alternative health-care practices. Samples from other regions might yield lower or higher estimates than we have reported. For example, a 1993 sample of 251 adults from rural Mississippi^{16,17} found that 70% had used a plant-derived nonprescription health remedy in the year prior to study, with the most common symptoms

treated being those of colds, sore throat, or cough (asthma-specific data were not reported).

Because our survey was not carried out with the principal goal of studying alternative practices, it was not comprehensive in the battery of practices elicited. We did not ask about chiropractic manipulation for asthma or rhinitis, we did not prompt for responses about the use of many specific botanicals that might be employed in asthma treatment, and we did not specifically query about yoga, Ayurvedic treatment, naturopathy, or hypnotherapy, among the range of possible treatments.³ In addition, we did not assess the frequency or regularity of the practices addressed and did not ascertain whether allopathic providers had encouraged or were even aware of the practices used.

Finally, it is important to note that our study was not a longitudinal analysis or a controlled clinical trial in which external factors as predictors of alternative practices could be studied over time (such as a change in access to care or insurance status) or in which the practices could be tested as predictors of health outcomes (such as hospitalization or emergency department care). We did observe an association between alternative practices and poorer physical health status and, to more limited extent, with poorer mental health status, but we are cautious not to label the practices studied as either preceding or following any decline in status. Prospective analyses will be critical in assessing the risks and benefits of alternative practices, taking into account disease severity, access to health care, costs of treatment, patient self-efficacy, interactions among treatments, and adverse effects. Reviews^{18–21} of manual therapy (*ie*, massage and chiropractic manipulation), Alexander technique, homeopathy, and acupuncture in asthma all have cited the need for further study of these practices if their potential efficacy is to be determined.

In our survey questionnaire, we used the term “less traditional or alternative” rather than complementary/alternative medicine.⁵ For consistency, we retained that terminology in this analysis. This usage, however, should not be interpreted as restrictive in defining the wide array of practices that we considered, especially self-treatment with caffeine which, appears to be particularly associated with asthma. Defined broadly, 4 in 10 subjects of those surveyed reported the use of alternative treatments for asthma or rhinosinusitis in the past 12 months. This information supports other observations indicating an increasing prevalence over the last decade of alternative, complementary, or unorthodox treatment use, by whatever terminology used. Health-care providers and public health and policy analysts should give greater attention to these practices in

assessing their potential impacts on health outcomes among those persons with these conditions.

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