Published in final edited form as:

Fertil Steril. 2010 May 1; 93(7): 2169–2174. doi:10.1016/j.fertnstert.2010.02.054.

The Use of Complementary and Alternative Fertility Treatment in Couples Seeking Fertility Care: Data from a Prospective Cohort in the United States

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Abstract

Objective—To determine the prevalence of Complementary and Alternative Medicine (CAM) use among couples seeking fertility care and to identify the predictors of CAM use in this population.

Design—Prospective cohort study

Setting—Eight community and academic infertility practices

Patients—428 couples presenting for an infertility evaluation

Interventions—Interviews and questionnaires

Main Outcome Measures—Prevalence of complementary and alternative medicine therapy

Results—After 18 months of observation, 29% of the couples had utilized a CAM modality for treatment of infertility; 22% had tried acupuncture, 17% herbal therapy, 5% a form of body work, and 1% had utilized meditation. An annual household income $\geq$ \$200,000 (OR 2.8, $p=.04$) relative to couples earning $<$ \$100,000, not achieving a pregnancy (OR 2.3, $p=.01$), and a positive attitude toward CAM use at baseline ($p<.001$) were independently associated with CAM use.

Conclusions—A substantial minority of infertile couples utilize CAM treatments. CAM was chosen most commonly by wealthier couples, those not achieving a pregnancy, and those with a baseline belief in the effectiveness of CAM treatments.

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Keywords

complementary and alternative medicine; motivation; outcome; prospective; infertility

Introduction

In the United States, infertility is a significant problem which affects 7–17% of all couples seeking to have children (1–5). Because of the expense associated with assisted reproductive technologies, some infertile couples may turn to complementary or alternative medicine (CAM) in an attempt to become pregnant using treatment that they may perceive as being lower cost, safer, or more effective (6). Examples of CAM that been described as treatments for infertility include pelvic physical therapy (7), hypnosis (8,9), yoga (10), homeopathy (11), spiritual healing (12), as well as acupuncture (8,9,21,24,25) and herbal therapy (22,23, 37–39).

Although Stankiewicz et al prospectively addressed the use of CAM by infertility patients in South Australia (13), the prevalence of CAM use for the treatment of infertility in the United States has not been reported. While it may be hypothesized that couples may pursue CAM out of financial need or a lack of success with mainstream fertility treatments, the motivations underlying the decision to pursue CAM have not been thoroughly investigated. The present study characterizes the prevalence and predictors of CAM fertility treatments among a cohort of couples seeking fertility care who were prospectively followed for 18 months.

Materials and Methods

Cohort Description

Couples were recruited into the study cohort from eight participating reproductive endocrinology clinics after the female partner presented for infertility treatment. The inclusion criteria for the study were defined as: currently trying to get pregnant with a male partner, English-speaking, no prior treatment with in vitro fertilization, no prior sterilization or hysterectomy, and living in proximity to one of the 8 participating centers. Of 809 women who met inclusion criteria, 436 (54%) agreed to participate, 428 of these couples responded to questions related to CAM use and were included in the present analysis. The institutional Committee on Human Research approved this protocol and all subjects provided written consent.

Outcome Variable

Utilization of complementary and alternative medicines by either member of the enrolled couple was determined by responses given during semi-structured interviews and to study questionnaires at four time points: enrollment (questionnaire), 4 month follow-up (interview), 10-month follow-up (interview), and 18-month follow-up (interview). At each of the follow-up interviews, participants who were not pregnant or who were reporting a new pregnancy, were asked, “Did you pursue any medical or non-medical options (since our last interview)? Non-medical options could include things such as acupuncture, Chinese medicine, homeopathy, chiropractic care, herbal treatment, or massage therapy.”

CAM was categorized as the use of acupuncture, herbal therapy (i.e. Chinese medicine, herbal therapy, or homeopathy), body work (i.e. chiropractic, massage), or meditation. A couple was considered to use CAM if either the male or female partner had utilized at least one of these modalities at any time point during the 18 month observation period.

Potential Predictors of the Use of CAM

Education, annual household income, female age, race/ethnicity, having a previous child, religious affiliation, and marital status were determined through answers to questionnaires completed by all participants. Education was dichotomized to less than college graduate or college graduate. Household income was categorized as less than \$100,000 per year, \$100,000–\$199,999 per year, or \$200,000 or more per year. Race and ethnicity was determined by female partner self-report and categorized to white, black, Hispanic, Asian, and other, according to guidelines utilized by the US Census (14). Because of low numbers in several of the racial and ethnic minority groups, race was dichotomized to white or non-white.

The etiology of infertility was obtained through medical record abstraction at the end of the 18-month observation period. The couple's infertility was classified into 4 groups: no known infertility etiology, male factor only, female factor only, or both male and female factors. Duration of infertility was calculated as the time from the date the couple began trying to achieve a pregnancy to the first interview. Treatments received during the study period were ascertained from medical records, augmented by information from interviews. Treatment groups were defined based on the highest intensity of treatment received: no cycle-based treatment, medications without intrauterine insemination, intrauterine insemination (IUI) with or without superovulation, and in-vitro fertilization (IVF). These options were ascertained for newly pregnant couples and those couples not pregnant at the time of the interview. Pregnancy status (i.e. pregnant, not pregnant, and unknown) was determined through interviews.

The “healthy habits” variable was generated by combining 11 responses to the question, administered through an enrollment questionnaire, “How likely do you think it is that if you did each of the following it would help you get pregnant?” The responses included: eating a healthy diet, avoiding caffeine, avoiding drinking alcoholic beverages, avoiding strenuous exercises, taking care of yourself, taking a vacation, being happy in your life, not working hard, avoiding stress, being relaxed, and thinking positively about your chances of getting pregnant. The perceived effectiveness of each lifestyle characteristic was rated on a 0 (not at all likely to help me get pregnant) to 10 (extremely likely to help me get pregnant) scale. Responses were summed and rescaled to range from 0–100.

A measure of the positive attitude towards CAM use was created by generating a composite score of five questions in the baseline interview ascertaining the degree to which each of the following would affect their fertility outcome: herbal treatment, massage, acupuncture, yoga or relaxation, or homeopathy. The perceived effectiveness of each treatment was rated on a 0 (not at all likely to help me get pregnant) to 10 (extremely likely to help me get pregnant) scale. Responses were summed and rescaled to range from 0–100.

Statistical Analysis

ANOVA was used to assess differences for continuous variables. We report Odds Ratios (OR) and their 95% confidence intervals to estimate the association between subject characteristics and the utilization of CAM therapy. The initial multivariate logistic regression models were developed with predictor variables selected *a-priori*. The final model was determined by backward stepwise logistic regression and included variables associated with CAM use at a p -value ≤ 0.20 . Statistical significance was set at $p < 0.05$ and all tests were 2-sided. STATA 10 (Statacorp, College Station, TX, USA) was used for all analysis.

Results

Four hundred twenty-eight women were included in the analysis (mean age 35.7, range 22–52). The majority were married (88%, Table 1), white (70%), college-graduates (72%), and had an annual household income of less than \$100,000 (58%). Only 24% had prior offspring. Isolated female factor (59%) was the most common infertility diagnosis followed by combined male and female factor (30%), male factor alone (7%), and no identified infertility diagnosis (5%). The mean duration of infertility was 2.1 years (SD 1.7). After 18 months of observation, no cycle-based fertility treatment was chosen by 28%, 5% used medications without IUI, 22% utilized IUI with or without superovulation, and 52% used IVF. On average, the couples utilized 2.8 cycles of fertility treatment. One hundred women had not achieved a pregnancy after 18 months of observation.

After 18 months, 29% of the couples had utilized one or more types of CAM therapy as a fertility treatment (Table 2). Overall, 22% had used acupuncture, 16% herbal therapy, 4% a form of body work (e.g. chiropractic or massage), and 1% had utilized meditation. A positive attitude toward CAM use ($p<.0001$) and a belief in healthy habits improving one's chances of achieving a pregnancy ($p=.002$) were associated with the utilization of CAM (Table 3).

Bivariate analyses demonstrated that each five-year increase in a woman's age was associated with a 28% increase in the odds of CAM use (OR 1.28, $p=.03$; Table 4). College graduates had a 62% increase in the odds of CAM use (OR 1.62, $p=.06$). Couples with an annual household income greater than \$200,000 were more likely to use CAM (OR 2.17, $p=.04$) relative to couples earning less than \$100,000. Those couples who utilized IVF had nearly a 2-fold increase in the odds of CAM use (OR 1.9, $p=.03$) relative to couples who used no cycle-based therapy. CAM-users utilized more cycle-based therapy compared to non-CAM users (OR 1.09, $p=.03$). Couples who did not achieve a pregnancy were more likely to use CAM (OR 2.3, $p=.001$).

On multivariable analysis (Table 5), an annual household income $\geq$ \$200,000 per year (OR 2.8, $p=.04$) relative to households earning less than \$100,000, failure to achieve a pregnancy (OR 2.3, $p=.01$), and a positive attitude toward CAM at baseline ($p<.001$) were independently associated with CAM usage. Age, educational status, previous children, infertility diagnosis, treatment type, number of treatment cycles, and higher scores on the healthy habits score failed to achieve statistical significance after multivariable adjustment.

Discussion

We found that CAM was used as a fertility treatment by 29% of 428 infertile couples in Northern California after 18 months of observation. Acupuncture and herbal therapy were the most commonly utilized modalities for the treatment of infertility (23% and 18%, respectively) while a much smaller fraction of study participants had utilized a form of body work or meditation. This utilization is congruent with reports of 31% CAM use among almost 500 infertile men in Canada (15) and 40% use by 400 women in Great Britain (16). Although Stankiewicz reported that 66% of 100 infertile couples in South Australia had used CAM (11), their higher utilization may be due to the inclusion of multivitamins as a CAM therapy. Cultural and socioeconomic differences may explain the higher prevalence (62%) of traditional medicine used for infertility among 252 couples in Turkey (17).

Participants in the current study utilized CAM after having had an initial consultation with a reproductive endocrinologist, a finding congruent with van Balen's Dutch study suggesting that couples consider mainstream medical treatments first but go on to pursue CAM after an initial infertility evaluation (18). However, Nachtigall's report that low-income infertile

Latino couples frequently utilize traditional medical remedies (such as teas and massage) in parallel with western medical interventions suggests the influence of cultural factors within specific patient populations (19). Although we did not observe racial differences in our data, this may have been due to the low proportion of minorities in our sample; other investigators have detected significant racial and ethnic differences in CAM use in non-infertility populations (20,21).

The expanded recognition and availability of CAM is a relatively recent phenomenon in the industrial West. Motivations underlying the use of CAM as a fertility treatment have received limited attention. Although we did not address patients' decision-making directly in this study, CAM users were more likely to be older, have a higher income, have used IVF, have a more positive attitude toward CAM use at baseline, and have failed to achieve a pregnancy. While it seems clear that a pre-existing positive attitude toward CAM would increase the likelihood of its implementation, the identification of age, income, treatment choice, and pregnancy status as variables associated with increased likelihood of CAM use raises several interesting questions.

Although age was associated with CAM use in bivariate models, this effect disappeared after adjustment for pregnancy status. It may be that, as older women have lower per cycle pregnancy rates, they are more likely to search for alternatives that improve their chances of achieving a pregnancy. Older women, with correspondingly higher incomes than younger women, may be better able to pay for additional fertility treatments. While it is possible that patients utilize CAM as a lower cost treatment alternative, our data suggest the opposite. Higher income couples choosing IVF were more likely to use CAM, not lower income couples as would be expected if CAM were chosen as a lower cost alternative to mainstream fertility treatments.

Consistent with the hypothesis that pregnancy status influences CAM use, Van Balen found, through face-to-face interviews with infertile couples, that reasons for using CAM fell into three broad categories: increasing the chances of having a child, failure of standard fertility treatments, and a desire to avoid standard medical fertility treatments (18). Rickhi et al found that a baseline predisposition to CAM use or failure of other medical therapies were strongly related to CAM use in a non-infertility population (22). Similarly, among 250 individuals in three CAM practices in the United Kingdom, several factors were found to be associated with choosing CAM: a belief in the value of treating the whole person, a positive opinion of CAM, the belief that CAM would be more effective than mainstream medicine, the ineffectiveness of mainstream medicine, the fear of potential adverse effects of mainstream medicine, and the belief that CAM treatment would allow for more direct patient participation in one's care (6). A unifying theme was that failure of mainstream therapy was commonly associated with CAM use, a hypothesis supported by our current study.

In contrast, Boivin and Schmidt, in their study of 728 infertile couples in Denmark, found that CAM use was associated with a significantly lower pregnancy rate among CAM users (31%) vs. non-CAM users (42%), suggesting that CAM use affected pregnancy outcomes (23). The authors are careful to point out that causality cannot be convincingly proven by their results. The direction of causality cannot be conclusively determined from our data because couples' pregnancy status and CAM use was not obtained for couples that had already achieved a pregnancy in earlier interview periods. With the relatively high prevalence of CAM use and many unanswered questions, there is a pressing need to understand the safety and efficacy of CAM use as a fertility treatment. To date, studies of CAM as a treatment for infertility have demonstrated benefit (24), ineffectiveness (25), and harm (15,26–29).

The self-selected nature of our recruitment process and recall bias on the part of participants may have resulted in over or under-reporting of the prevalence of CAM utilization in this study. The proportion of male factor infertility was relatively low in our cohort. This likely reflects the fact that participants were recruited from couples presenting to reproductive endocrinology clinics. Given these factors, it is possible that results from our study cohort are not generalizable to other infertility populations. The relatively small number of minorities in our study limits our ability to characterize use of CAM for fertility purposes in non-white individuals. Furthermore, the present study was not designed to reveal a real or perceived efficacy of CAM use for the purposes of establishing pregnancy. That acupuncture and herbal medications were the most utilized CAMs may reflect greater access to these therapies because of their relatively high availability in Northern California.

Nevertheless, to our knowledge this is the first reported prospective study of predictors for CAM use among infertile couples in the United States. Further studies on minority groups and from other geographic regions will further illuminate what factors may drive patients to seek alternative medical treatments for infertility. Additional well-designed and controlled studies will be required to demonstrate whether CAM treatments are likely to be of benefit or detriment to men and women seeking treatment for infertility.

Conclusion

CAM is used by a substantial minority of patients presenting for treatment of infertility. CAM use is associated with a baseline predisposition to using CAM, higher household income, and failure to achieve a pregnancy.

Acknowledgments

We gratefully acknowledge the contributions of the other members of the Infertility Outcomes Program project who participated in study design and data collection: Nancy Adler, PhD; Jonathan Showstack, PhD, MPH; Mary Croughan, PhD; and Steven Gregorich, PhD.

Support: Grant HD37074 from the National Institute for Child Health and Human Development (NICHD/NIH)

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Demographic, Socioeconomic, Treatment, Outcome, and CAM Use Characteristics of Couples Seeking Fertility Care

Table 1

	Overall* (N=428)				No CAM Use (N=305)				Any CAM Use (N=123)			
	N	%	N	%	N	%	N	%	N	%	N	%
Female age (years)												
<30	45	10.5	37	12.2	8	6.5						
30-34	124	29.0	92	30.3	32	26.0						
35-39	162	37.9	112	36.8	50	40.7						
40-44	84	19.7	53	17.4	31	25.2						
45+	12	2.8	10	3.3	2	1.6						
Married	373	87.6	267	88.1	106	86.2						
Years married (mean, SD)	4.6	3.8	4.5	3.8	4.6	3.7						
White female	298	70.0	214	70.6	84	68.3						
College graduate	303	72.0	208	69.3	95	78.5						
Household Income (\$)												
< 100,000	250	58.4	184	60.3	66	53.7						
100,000 – 199,000	82	19.2	54	17.7	28	22.8						
≥ 200,000	32	7.5	18	5.9	14	11.4						
Unknown	64	15.0	49	16.1	15	12.2						
Any religious affiliation	343	80.1	246	80.7	97	78.9						
Duration of infertility (mean, SD)	2.1	1.7	2.1	1.8	2.2	1.4						
Previous child	103	24.2	81	26.7	22	17.9						
Not pregnant after 18 months	100	33.0	57	27.1	43	46.2						
Infertility diagnosis												
Male and female factors	128	29.9	89	29.2	39	31.7						
Female factor only	251	58.6	174	57.1	77	62.6						
Male factor only	29	6.8	25	8.2	4	3.3						
No male or female factor identified	20	4.7	17	5.6	3	2.4						
Treatment type												
No cycle-based treatment	94	22.0	73	23.9	21	17.1						
Medications without IUI	21	4.9	19	6.2	2	1.6						

	Overall* (N=428)		No CAM Use (N=305)		Any CAM Use (N=123)	
	N	%	N	%	N	%
Intrauterine insemination	92	21.5	70	23.0	22	17.9
In-vitro fertilization	221	51.6	143	46.9	78	63.4
Number of treatment cycles (mean, SD)	2.8	2.7	2.6	2.6	3.2	2.7

* All variables do not sum to 428 due to missing data

Table 2
Cumulative Prevalence of Complementary and Alternative Medicine Use among Couples Seeking Infertility Care *

	Baseline		4 Month		10 Months		18 Months	
	N	%	N	%	N	%	N	%
Any complementary or alternative medicine	58	13.6	84	19.6	110	25.7	123	28.7
Acupuncture	49	11.5	68	15.9	86	20.1	96	22.4
Herbal therapy	27	6.3	47	11.0	67	15.7	73	17.1
Body work	6	1.4	15	3.5	19	4.4	20	4.7
Meditation	N/A	N/A	3	0.7	5	1.2	5	1.2

* Columns do not sum to 100% due to utilization of multiple treatments

Table 3

Relationship between Lifestyle Beliefs among Female CAM Users and Non-Users at the Time of Study Enrollment*

Healthy Habits [†]	Mean Scores				
	Non-CAM User	CAM User	Δ	SD	P-value
1. Eat a healthy diet	6.1	7.1	1.1	3.0	<.001
2. Avoid caffeine	5.6	6.3	0.7	3.2	0.04
3. Avoid drinking alcoholic beverages	5.9	6.7	0.8	3.4	0.04
4. Avoid strenuous exercise	4.3	4.8	0.5	3.2	0.22
5. Take care of yourself	7.3	8.1	0.8	2.8	0.02
6. Take a vacation	4.5	5.8	1.3	3.3	<.001
7. Being happy in your life	6.4	7.0	0.6	2.9	0.05
8. Not working too hard	5.7	6.4	0.7	2.9	0.01
9. Avoid stress	6.7	7.5	0.8	2.7	0.01
10. Being relaxed	6.7	7.5	0.8	2.8	<.001
11. Think positively about your chances of getting pregnant	6.4	7.3	0.9	3.0	0.003
Healthy Habits [†]	59.9	67.7	7.8	23.6	0.002
Positive CAM attitude[‡]					
1. Use herbal treatments	2.9	4.7	1.8	3.0	<.001
2. Have massage or acupuncture treatments	2.9	5.3	2.4	3.1	<.001
3. Have acupuncture treatments	2.7	5.1	2.4	3.1	<.001
4. Take yoga or relaxation classes	4.1	6.1	2.0	3.2	<.001
5. See a homeopathic or other alternative healer	2.6	4.8	2.2	3.0	<.001
Positive CAM attitude [‡]	30.6	52.1	21.5	27.1	<.001

* Respondents were asked, "How likely do you think it is that if you did each of the following it would help you get pregnant? (0 not likely, 10 extremely likely)"

[†] Defined by: (sum of 11 questions/110)*100

[‡] Defined by: (sum of 5 questions/50)*100

Table 4

Bivariate Relationship between Demographic, Psychological, and Fertility Related Factors and the Utilization of Complementary and Alternative Treatment over 18 Months of Observation.*

	OR	95% CI	P-value	
Female age (5 year increase)	1.28	1.02	1.60	0.03
Married	0.84	0.45	1.56	0.58
Years married (1 year increase)	1.01	0.95	1.06	0.86
White female	0.90	0.57	1.41	0.63
College graduate	1.62	0.98	2.66	0.06
Annual household income				
< \$100,000	1.00	ref	ref	ref
\$100,000–\$200,000	1.45	0.85	2.47	0.18
>\$200,000	2.17	1.02	4.60	0.04
Unknown	0.85	0.45	1.62	0.63
Any religious affiliation	0.89	0.53	1.50	0.67
Duration of infertility (1 year increase)	1.02	0.89	1.15	0.82
Previous children	0.60	0.35	1.01	0.06
Pregnancy status after 18 months				
Pregnant	1.0	ref	ref	ref
Not pregnant	2.31	1.39	3.84	0.001
Unknown	.97	.57	1.63	.90
Infertility diagnosis				
Male and female factors	1.00	ref	ref	ref
Female factor only	1.01	0.64	1.60	0.97
Male factor only	0.37	0.12	1.12	0.08
No male or female factor identified	0.40	0.11	1.45	0.17
Treatment type				
No cycle-based treatment	1.00	ref	ref	ref
Medications without IUI	0.37	0.08	1.70	0.20
Intrauterine insemination only	1.09	0.55	2.16	0.80
In-vitro fertilization	1.90	1.08	3.31	0.03
Number of treatment cycles (1 additional cycle)	1.09	1.01	1.17	0.03

	OR	95% CI	P-value
Healthy Habits (.5 SD increase)	1.21	1.07	1.36
Positive CAM attitude (.5 SD increase)	1.53	1.36	1.73
			<.001

* Variables used in final multivariable model highlighted in table.

Table 5

Multivariable Predictors of the Utilization of Complementary and Alternative Treatment over 18 Months of Observation

	OR	95% CI	P-value
Female age (5 year increase)	1.29	0.95	1.76 0.10
College graduate	1.22	0.63	2.36 0.55
Annual Household Income			
< \$100,000	1.00	ref	ref
\$100,000–\$200,000	1.82	0.91	3.62 0.09
>\$200,000	2.76	1.05	7.27 0.04
Unknown	0.77	0.33	1.82 0.56
Previous children	0.81	0.42	1.58 0.54
Pregnancy status after 18 months			
Pregnant	1.0	ref	ref
Not pregnant	2.34	1.22	4.46 0.01
Unknown	2.0	.90	4.43 .09
Infertility diagnosis			
Male and female factors	1.00	ref	ref
Female factor only	0.92	0.51	1.67 0.79
Male factor only	0.30	0.08	1.16 0.08
No male or female factor identified	0.32	0.06	1.83 0.20
Treatment type			
No cycle-based treatment	1.00	ref	ref
Medications without IUI	0.29	0.03	2.97 0.30
Intrauterine insemination only	0.86	0.32	2.33 0.76
In-vitro fertilization	2.38	0.95	5.92 0.06
Number of treatment cycles	1.02	0.90	1.15 0.78
Healthy Habits (.5 SD increase)	0.86	0.72	1.02 0.08
Positive CAM attitude (.5 SD increase)	1.85	1.54	2.23 <.001