

Original Articles

Complementary and Alternative Therapies in Childhood Attention and Hyperactivity Problems

EUGENIA CHAN, M.D., M.P.H.
LEONARD A. RAPPAPORT, M.D.
KATHI J. KEMPER, M.D., M.P.H.

Division of General Pediatrics, Children's Hospital, Boston, Massachusetts

ABSTRACT. To determine the prevalence and factors associated with complementary and alternative medicine (CAM) use for childhood attention and hyperactivity problems, we surveyed parents of children referred for evaluation of attention-deficit hyperactivity disorder (ADHD). Parents indicated whether they had used CAM therapies (e.g., acupuncture, nutritional supplements) in the past year and rated how important different reasons were in making their therapy decisions. Overall, 62 of 114 (54%) parents reported using CAM, most commonly expressive therapies, vitamins, and dietary manipulation, to treat their child's attention problems. Parents who used CAM rated a "natural therapy" and "having more control over treatments" significantly more important in their choice of therapy than parents who did not use CAM. Only 11% of parents discussed using CAM with their child's physician. Because parents often use CAM to treat their child's attention and hyperactivity problems without their pediatrician's knowledge, pediatricians need to initiate discussions of CAM use with patients and families. *J Dev Behav Pediatr* 24:4-8, 2003. Index terms: *attention-deficit hyperactivity disorder, therapy, complementary and alternative medicine.*

Attention and hyperactivity problems, including attention-deficit hyperactivity disorder (ADHD), are common behavioral disorders, with an estimated prevalence ranging between 3% and 11% of all children.¹⁻³ Clinical manifestations include core symptoms of impulsivity, inattention, and motor overactivity. Lacking a known molecular or biochemical cause, ADHD can be difficult to diagnose and controversial to treat.

In general, treatment of ADHD relies on a combination of medical intervention, environmental and educational accommodations, and individual counseling or behavior modification. The most well-studied and effective medical treatments have been psychostimulants such as methylphenidate and dextroamphetamine, although they are not universally effective.⁴⁻⁶ In addition to their positive effects, stimulants have certain undesirable side effects such as appetite suppression and sleep disturbance. The prospect of their long-term use in children makes many parents uneasy and has spurred them to search for treatments that are "more natural" or "safer," at least in perception if not in fact.

Parallel to a national increase in the adult use of complementary and alternative medicine (CAM),⁷ evidence

indicates that CAM use in children has also become more prevalent. For example, in a recent study of families in the Washington, D.C. area, 40% of parents reported using CAM themselves, and 21% reported using it in their children.⁸ Only 36% of the parents who treated their child with CAM had discussed it with their child's pediatrician. Other studies have demonstrated frequent CAM use in children with chronic illnesses such as cancer and cystic fibrosis.⁹⁻¹¹

Anecdotal evidence indicates that CAM use in children with ADHD is also increasing. For example, marketing for alternative therapies such as herbal remedies, elimination diets, and food supplements is readily apparent on the web site of the national organization Children and Adults with Attention-Deficit/Hyperactivity Disorder (CHADD).¹² Numerous studies on individual therapies (e.g., Feingold diet,¹³ chiropractic,¹⁴ or megavitamins¹⁵) have also appeared in the medical and alternative therapy literature.

Few systematic studies of the prevalence of CAM use in ADHD have been conducted. Stubberfield and Parry¹⁶ surveyed 290 families who had a child diagnosed with ADHD in a multidisciplinary referral center in western Australia. Sixty-four percent had tried at least one "other therapy," most commonly dietary restriction, multivitamin supplementation, and occupational therapy. A 1997 American Academy of Pediatrics Ambulatory Care Quality Improvement Program self-assessment exercise found that

Address for reprints: Eugenia Chan, M.D., M.P.H., 588 Cabot Mail Center, Cambridge, MA 02138; e-mail: eugenia_chan_ab91@post.harvard.edu.

38% of pediatricians had patients using alternative therapies for ADHD, most commonly dietary manipulation such as eliminating food additives, preservatives, or sugar.¹⁷

The purpose of this study was to describe the prevalence of and factors associated with CAM use in childhood attention and hyperactivity problems, including ADHD, in a referral population. Because the definition of CAM has changed since the first national survey of CAM use in 1993,¹⁸ we have chosen to use the Cochrane Collaboration's recent definition of a "broad domain of healing resources...other than those intrinsic to the politically dominant health systems of a particular society or culture in a given historical period."¹⁹ On the basis of previous studies of adults and children with chronic or serious medical and social conditions, we hypothesized that a majority of children with ADHD have been treated with CAM, often without the primary care physician's knowledge, and that the most common CAM therapies for ADHD were dietary manipulation, dietary supplements, and herbal remedies. We predicted that children who were treated with CAM were more likely to have experienced significant side effects of stimulant medication, and that parents who treated their children with CAM were of higher socioeconomic status, were more concerned about side effects of prescribed medications, and placed more importance on using natural therapies.

METHODS

We conducted a cross-sectional survey of all children with a referral or final diagnosis of attention-deficit hyperactivity disorder (ADHD) who were evaluated at the Developmental Medicine Center at a major urban children's hospital from January 1, 1999, to December 31, 1999. Eligible children were identified by the Developmental Medicine Center's clinical database using a referral or final diagnosis code of "ADHD," "attention-deficit disorder" (ADD), or "attention problem." Children were excluded if they had a concurrent diagnosis of pervasive developmental disorder (PDD), PDD spectrum disorder, or autism, or if a current address was unknown.

Parents of eligible children were mailed a six-page, anonymous, self-administered survey on the use of complementary and alternative medicine (CAM) in the past year. We defined CAM broadly as any alternative or adjunctive therapy used by parents to manage their child's attention and hyperactivity problems (see Table 1 for categories of CAM). The survey asked parents to indicate which types of CAM they had used for their child in the past year (e.g., herbs, dietary manipulation, biofeedback) and what specific therapy it was (e.g., pycnogenol, Feingold diet).^{*} Parents also rated on a 5-point Likert scale how important (1 = *not important* to 5 = *very important*) different reasons were in making therapy decisions for their children. Reasons for choosing therapies ranged from "wanted more control over treatment" and "preferred a 'natural' therapy" to "physician-recommended" and "preferred a scientifically proven therapy."

^{*}Complete survey available on request from the authors.

Table 1. Most Commonly Used Complementary and Alternative Therapies for Attention and Hyperactivity Problems^a

Therapy	Frequency	% of Total Sample Reporting Use
Expressive (e.g., sensory integration, occupational therapy, art, music, dance)	24	21
Vitamins	24	21
Dietary manipulation (e.g., Feingold, sugar elimination)	16	14
Special exercises (e.g., yoga, tai chi)	11	10
Relaxation techniques (e.g., meditation)	9	8
Dietary supplements (e.g., blue green algae, pycnogenol)	8	7
Prayer	8	7
Biofeedback	6	5
Chiropractic	6	5
Herbal remedies (e.g., St. John's wort, chamomile)	6	5
Massage	6	5
Healer/healing touch	2	2
Hypnosis	1	1

^aSum of percentages exceeds 100% because many families reported using more than one therapy each.

We also collected demographic information such as child's age, gender, parents' level of education, and annual household income. Surveys took approximately 10 minutes to complete and were pilot tested on 20 potential subjects, revised, and tested on 20 more.

Parents who did not respond to two mailings, spaced 3 weeks apart, were reminded by telephone. They then had the option to complete the survey over the phone or have another survey mailed to them.

Survey responses were entered into an Access database (Microsoft Corp., Bellevue, WA) and analyzed using SAS version 8.0 (SAS Institute, Inc., Cary, NC). Descriptive statistical analyses were performed using cross-tabulations and frequency counts to examine relationships between the use of CAM and sociodemographic characteristics. We used logistic regression to adjust for intercorrelations among multiple variables. To compare how CAM users and nonusers ranked the importance of reasons for choosing therapy, we used the Wilcoxon rank sum test for two-group comparisons.

This study was approved by the Children's Hospital Institutional Review Board.

RESULTS

Of the 203 eligible families, 114 (56%) returned the surveys. As is typical for our center's referral population, the majority of children were male (73%), white (80%), and lived in households reporting an income of \$50,000 or greater (59%). More than half of parents (50% of fathers and 62% of mothers) held a college or graduate degree.

Although all 114 children were referred to the Developmental Medicine Center for evaluation of attention-deficit hyperactivity disorder (ADHD), only 64 (56%) met

DSM-IV criteria for the diagnosis of ADHD; the rest were determined to have subclinical attention problems or had attention and hyperactivity difficulties secondary to another diagnosed condition. Seventy-one children in our sample (62%) had at least one condition in addition to their attention problems or ADHD, most commonly learning disorders or difficulties (n = 42, 37%), anxiety disorders (n = 17, 15%), depression or bipolar disorder (n = 16, 14%), and language or speech disorders (n = 8, 7%).

Fifty-eight of the 114 children (51%) were prescribed medications to treat their attention problems within the past year. Stimulants were the most commonly used, including methylphenidate (n = 39), dextroamphetamine (n = 13), and mixed amphetamine salts (Adderall[®], n = 11). Sixteen children reported using nonstimulant medications, such as clonidine (n = 7), or antidepressants/mood stabilizers, such as sertraline and lithium (n = 8). Thirty-five of the 58 children (57%) receiving medication reported side effects such as anorexia, gastrointestinal disturbance, and moodiness or irritability.

Overall, 62 parents (54%) reported using complementary and alternative medicine (CAM) therapies to treat their child's attention problems in the past year. Thirty-six of these children (58%) met DSM-IV criteria for ADHD; the rest did not. Users did not differ from nonusers in terms of child's age, race, parents' level of education, or household income. More girls were in the CAM user group than in the nonuser group (36% vs 15%, *p* = .01). Children who had experienced side effects to prescribed medications were no more likely to use CAM than children who did not experience side effects ($\chi^2 = 0.0005$, *p* = .98).

Table 1 lists the most commonly used therapies. (Because many children used more than one type of therapy, the number of times a therapy is used may exceed the total number of children.) Of the 62 children who used CAM, 24 (38.7%) had been treated with various expressive therapies such as sensory integration/occupational therapy (n = 7), dance/gymnastics (n = 7), art (n = 6), and music (n = 4). Twenty-four (38.7%) had received vitamin therapy, including multivitamin complexes. Sixteen (25.8%) had been treated with some type of dietary manipulation, most commonly a low-sugar/sugar-free diet (n = 6) or the Feingold/additive-free diet (n = 4). The most commonly used dietary supplements were evening primrose oil (n = 3) and blue green algae (n = 2). Although one parent reported using a magnet mattress, no parent reported using crystals. Eight children (7%) had consulted CAM practitioners during the past year, including chiropractors (n = 7), massage therapists (n = 2), an acupuncturist (n = 1), and a homeopath (n = 1). No naturopaths were consulted; naturopaths are not licensed to practice in Massachusetts. Only 12 parents (11%) reported discussing CAM therapies with their child's physician.

When asked what treatments they would suggest other parents use, 24 parents recommended CAM therapies such as music, diet modification, sensory integration, and exercise; eight parents recommended stimulant medications. When asked what therapies they would suggest other parents avoid, seven parents warned against prescription medications such as methylphenidate, and seven warned

Table 2. Most Important Reasons for Using Choosing Therapies^a

Reason	CAM Users (Mean Importance)	CAM Nonusers (Mean Importance)
Prefer a natural therapy*	3.6	2.9
Want more control over treatment**	3.7	3.3
Cultural/family tradition	2.4	2.4
Recommended by family or friends	3.1	2.9
Concerned about side effects to medication	4.3	4.0
Experienced side effects to medication	3.4	3.5
Prefer a scientifically proven therapy	3.8	4.1
Hoped for a cure	4.1	4.2
Physician-recommended	4.2	4.5

CAM, complimentary and alternative medicine.
^aLikert scale, 1 = not important, 5 = most important.
 **p* < .001, Wilcoxon *z* = -3.50;
 ***p* = .04, Wilcoxon *z* = -2.03.

against “unproven” therapies such as blue-green algae and magnets.

For the most part, the importance of various reasons for making treatment decisions were similar for CAM users and nonusers (Table 2). The two groups did not differ in how they rated the importance of cultural or family tradition, concern about or experience of side effects to prescription medication, recommendations by friends and family, scientifically proven therapies, recommendations by physicians, or the possibility of a cure. However, compared with CAM nonusers, CAM users expressed a strong preference for a “natural therapy” (mean importance rating 3.6 vs 2.9, *z* = -3.50, *p* < .001) and “wanted more control over treatment” (mean importance rating 3.7 vs 3.3, *z* = -2.03, *p* = .04).

DISCUSSION

Recently, much media attention has been directed at attention and hyperactivity problems and the prescription medications used to treat them. In the lay press, continuing controversy over the safety and appropriateness of stimulant treatment has led to increased parental anxiety and the use of complementary and alternative therapies. Although clinicians are becoming increasingly aware of complementary and alternative medicine (CAM) use in attention-deficit hyperactivity disorder (ADHD), this is the first systematic documentation of such use in U.S. medical literature.

In our specialty referral population, we found that more than half of children with ADHD had received complementary and alternative therapies within the past year. Parents who were CAM users believed it was more important to have natural therapies and more control over treatment than parents who were not CAM users. Socio-economic status, age, prior stimulant therapy, and having a concurrent condition did not distinguish between CAM users and nonusers.

We had hypothesized that a majority of children with ADHD had been treated with CAM. Our finding of 54% CAM use is consistent with the literature, despite the changing definitions of CAM over time. One Australian study found that 64% of children with ADHD had used CAM,¹⁶ and an informal survey of 100 consecutive families seen in an attention deficit disorder (ADD) clinic in Seattle found that 80% of parents had tried some form of dietary manipulation.²⁰ These rates are also comparable to other self-report studies of children with serious or chronic medical and psychosocial conditions, including 70.1% in homeless youth, 70% in patients with juvenile rheumatoid arthritis, and 66% in children with cystic fibrosis.^{11,21,22} In comparison, other prevalence studies in more general pediatric populations show a lower rate of CAM use, for example, 21% in the Washington, D.C. area, 20.5% in outpatient clinics in the greater Bath (U.K.) area, and 11% in outpatient clinics in Montreal.^{8,23,24}

Unlike previous studies of CAM use in children, our study found the most common CAM therapies used were expressive therapies, vitamins, and dietary manipulation. This likely reflects not only the ever-changing popularity of different therapies, different years, and different geographical areas but also the broadened definition of CAM over time. For example, although activities such as art or sports may not appear to be therapies in the same sense as vitamins or elimination diets, they do fall within the Cochrane collaboration's definition of CAM if families view the activity as a method (whether alternative or adjunctive to more conventional therapies) to manage their child's attention and hyperactivity problems. We have recently reviewed the evidence for certain herbal remedies and nutritional supplements that, by anecdotal report, appear to be commonly used for ADHD.²⁵ Although dietary manipulation (excluding dietary supplements) for attention and hyperactivity problems has had a long history, we were surprised that less than one third of our sample had tried it, as other studies have indicated that 40% to 80% of families have tried Feingold-like or low/no-sugar diets.^{16,20} Expressive therapies, comprising such diverse therapies as music, dance, sensory integration, and occupational therapy, were remarkably common in our sample. This may reflect both the rising popularity of sensory integration and parents' awareness of the therapy at our institution.

Contrary to our expectations, we did not find that children who had experienced side effects from prescribed medication or who were taking stimulants were more likely to have received CAM therapy. This is remarkable considering that more than half of our sample reported side effects to prescription medication. Stubberfield and Parry similarly found that the percentage of children using CAM did not differ between those taking stimulants and those not taking stimulants (66% vs 62%).¹⁶

Why patients use CAM is an important question because it gives insight into patient preferences and perceptions of "mainstream" medical care. In one study, word-of-mouth recommendations, fear of medication side effects, chronic medical problems, or dissatisfaction with conventional medicine were common reasons for parents to choose CAM.²⁴ Homeless youth who reported using CAM did so

because it was natural and organic; approximately one fourth cited negative experiences with or mistrust of physicians.²¹ In a study of CAM use in adults, Astin reported that although the need for control and dissatisfaction with conventional medicine were not significantly related to CAM use, adults with poorer health status, higher education level, certain chronic medical problems such as back problems and chronic pain, and a holistic orientation to health or who had experienced a "spiritual transformation" were more likely to use CAM.²⁶

Our results are somewhat different and likely reflect both the condition-specific and mostly well-educated, motivated population studied. Parents who used CAM rated natural therapies and control over therapies as more important in making therapy decisions for their children than parents who did not use CAM, although neither group rated these reasons as particularly important. Both CAM users and nonusers also gave high importance ratings for physician recommendations and scientifically proven therapies. This indicates that parents, unlike many physicians, may not view CAM as distinctly different from conventional medicine; thus they may expect physicians to be familiar with CAM therapies and recommend them if appropriate.

We would expect, therefore, that families would be eager to discuss CAM use with their child's physician. In the Ambulatory Care Quality Improvement Program assessment exercise, for example, 93% of pediatricians reported that parents ask them about alternative treatments for ADHD,¹⁷ although it is unclear what percentage of families of children with ADHD this represents. We were struck by how few families (11%) in our study reported such a discussion. From our data it was not possible to know whether this is because physicians did not bring up the issue or whether parents were reluctant to discuss CAM therapies with a medical doctor. Other studies have indicated that approximately one third of families discuss CAM therapies with medical practitioners.

To our knowledge, our study is the first to ask parents for their recommendations regarding treatments for attention and hyperactivity problems. The treatments recommended by parents for other parents reflected the broad variety of CAM therapies used for ADHD, whereas the treatments specifically warned against were limited to prescription medications and a few "unproven" therapies. This indicates that parents may be more open to trying a variety of different therapies, either in lieu of or as an adjunct to prescription medication.

The primary limitation of this study is its generalizability. Our institution is a tertiary children's hospital receiving referrals from much of eastern Massachusetts and New Hampshire, and our sample reflects the predominantly white, relatively wealthy, and well-educated demographics of this referral population. Our results, therefore, may not reflect the patterns of CAM use for attention and hyperactivity problems seen in a general pediatric practice in our area or elsewhere in the United States. Furthermore, because we did not have the information needed to compare respondents and nonrespondents, it is possible that the prevalence of 54% CAM use in our study is an overestimate if, as in previous studies, more well-educated

and higher-income families were more likely to use CAM and return surveys. Finally, our survey was a self-administered instrument relying on parents' ability to recall information within the past year. Although a year is a limited time frame, many details can be easily forgotten or disproportionately magnified. Families who have a more holistic orientation to health may be able to recall more CAM use than families who are skeptical of nonconventional therapies. We have no objective documentation of either the child's medical history, CAM use, physician-family discussion of CAM therapies, or efficacy of the CAM therapies used. Future work in this area should attempt to incorporate such objective measures.

Despite these limitations, it is clear that the use of CAM to treat ADHD is common, and that the families who use

CAM probably have a different set of values underlying their treatment decisions. Although the popularity of certain CAM therapies may increase and decrease over time, reasons for using CAM are unlikely to change. Pediatric providers need to initiate discussions about CAM use to understand their patients' and families' treatment preferences and values more fully. Finally, given the wide use of CAM and the amount of time and resources families of children with ADHD spend on CAM therapies, it is essential to begin studying the efficacy of specific CAM therapies compared with stimulants.

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