# Homeopathy for Attention-Deficit/Hyperactivity Disorder: A Pilot Randomized-Controlled Trial

JENNIFER JACOBS, M.D., M.P.H., ANNA-LEILA WILLIAMS, P.A.-C., M.P.H., CHRISTINE GIRARD, N.D., VALENTINE YANCHOU NJIKE, M.D., M.P.H., and DAVID KATZ, M.D., M.P.H.

#### **ABSTRACT**

**Objectives:** The aim of this study was to carry out a preliminary trial evaluating the effectiveness of homeopathy in the treatment of attention-deficit/hyperactivity disorder (ADHD).

**Design:** This work was a randomized, double-blind, placebo-controlled trial.

**Settings/Location:** This study was conducted in a private homeopathic clinic in the Seattle metropolitan area.

**Subjects:** Subjects included children 6–12 years of age meeting *Diagnostic and Statistical Manual of Mental Disorders* 4th edition (DSM-IV) criteria for ADHD.

**Interventions:** Forty-three subjects were randomized to receive a homeopathic consultation and either an individualized homeopathic remedy or placebo. Patients were seen by homeopathic physicians every 6 weeks for 18 weeks.

Outcome Measures: Outcome measures included the Conner's Global Index—Parent, Conner's Global Index—Teacher, Conner's Parent Rating Scale—Brief, Continuous Performance Test, and the Clinical Global Impression Scale.

**Results:** There were no statistically significant differences between homeopathic remedy and placebo groups on the primary or secondary outcome variables. However, there were statistically and clinically significant improvements in both groups on many of the outcome measures.

**Conclusions:** This pilot study provides no evidence to support a therapeutic effect of individually selected homeopathic remedies in children with ADHD. A therapeutic effect of the homeopathic encounter is suggested and warrants further evaluation. Future studies should be carried out over a longer period of time and should include a control group that does not receive the homeopathic consultation. Comparison to conventional stimulant medication for ADHD also should be considered.

#### INTRODUCTION

A ttention-deficit/hyperactivity disorder (ADHD) affects between 3%–8% of school-age children and is one of the most common childhood psychiatric disorders. <sup>1,2</sup> The widespread use of stimulant medications for

this disorder, such as methylphenidate (MPD) and dexamphetamine, is thought to enhance short-term behavioral, academic, and social functioning.<sup>3</sup> However, concern about side-effects, such as tics, insomnia, and irritability, as well as questions about the long-term safety of these medicines and personal preference to avoid stim-

<sup>&</sup>lt;sup>1</sup>Department of Epidemiology, University of Washington School of Public Health and Community Medicine, Seattle, WA.

<sup>&</sup>lt;sup>2</sup>Yale Prevention Research Center, New Haven, CT.

<sup>&</sup>lt;sup>3</sup>Cancer Treatment Centers of America, Tulsa, OK.

<sup>&</sup>lt;sup>4</sup>Yale University School of Medicine, New Haven, CT.

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ulants, has led many parents to seek alternative treatments for ADHD. 4-6

Homeopathy is a highly systemized medical therapy based on the principle of similars, which posits that substances that can cause symptoms in healthy people can cure similar symptoms in those who are ill. The use of stimulants to treat ADHD can be seen as a modern-day example of this principle. Homeopathic remedies are made from plant, animal, and mineral substances, which are diluted to extremely small doses for use in clinical practice. Despite these high dilutions, there is a significant body of literature suggesting the clinical efficacy of homeopathy when compared to placebo, 7–9 although this evidence is not conclusive. Homeopathic prescriptions are individualized for each person, taking into account a wide variety of physical, mental, and emotional symptoms. This has made clinical trials for this modality a methodological challenge.

Two previous studies have shown promising results using individualized homeopathy to treat ADHD. The first, a nonrandomized, single-blind experiment of 43 children using a 5-point Likert scale, found statistically significant improvements after 10 days in the verum group when compared to placebo. <sup>12</sup> After crossover to verum, the placebo group also improved statistically when compared to itself. The second was an open study in which homeopathic medicines were prescribed and changed over time until clinical improvement was reported by parents. <sup>13</sup> Children whose behavior remained unacceptable over a variable amount of time were deemed treatment failures and were placed on MPD. Of 115 children initially assessed, 75% responded sufficiently to homeopathy, usually within the first 6 months, and 25% needed MPD.

There have also been anecdotal reports of the benefits of homeopathy in the treatment of ADHD, including claims of a 70% success rate after 1 year. <sup>14</sup> In this pilot study, we compared individualized homeopathic remedies to placebo in a randomized, double-blind, placebo-controlled trial.

### MATERIALS AND METHODS

Study subjects

Subjects were recruited from the Seattle metropolitan area using newspaper advertisements, posters, and direct mail to health care professionals and psychologists. Children 6–12 years of age with a presumptive diagnosis of ADHD were screened for inclusion into the study using the computerized Diagnostic Interview Schedule for Children Version IV (DISC-IV). Only those children meeting *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV) Criteria for ADHD were considered for entry into the study. Informed consent was obtained from a parent and the child using written forms approved by the Yale University Human Investigations Committee and the Bastyr University Human Subjects Committee.

Children who were taking stimulant medication were included in the study if their dosage had been stable for 6 months prior to enrollment and they were still exhibiting symptoms of ADHD. Exclusion factors included comorbid medical or psychological conditions that influenced behavior or the ability to complete the study protocol or required the use of medications thought to interfere with homeopathic treatment, such as corticosteroids. Subjects were also excluded if they were home-schooled, as one of the outcome measures included evaluation by classroom teachers.

## Intervention

At the initial visit, a homeopathic physician conducted a homeopathic evaluation of each subject and prescribed an individualized homeopathic remedy that best matched the symptom picture for that subject. Both prescribing physicians had more than 20 years of experience and were board certified in classical homeopathy. The physicians were not limited in the possible remedies, potency of medicines, or frequency of the doses they could prescribe.

Follow-up visits with the homeopathic physicians were conducted at 6, 12, and 18 weeks after the initial evaluation. At each of these visits, the subjects were evaluated, questioned about adverse side-effects, and the individualized homeopathic prescription was renewed or revised. Although the specific homeopathic prescription might have changed, subjects randomized to each group continued to receive placebo or active medicines throughout the study.

## Randomization and study medications

The homeopathic prescription was communicated by fax or e-mail to a homeopathic pharmacist, who randomized the subjects to receive either a verum homeopathic remedy or a placebo. The randomization was done in blocks of four using a computerized random number generator, and stratification was done by gender and use or nonuse of stimulant medication. Once assigned to a treatment group, all subsequent prescriptions for that subject were filled according to the initial randomization. Study medications were express mailed to subjects' home addresses, along with dosage instructions.

All study medications were manufactured and donated by Hahnemann Laboratories and Pharmacy (San Rafael, CA). The homeopathic medicines were prepared by impregnating pellets made of 85% sucrose and 15% lactose with a liquid homeopathic dilution. The homeopathic dilutions were prepared using stock solutions of mother tinctures that had been prepared according to the standards of the Homeopathic Pharmacopoeia of the United States (HPUS). <sup>16</sup> Pellets impregnated with a similar water-alcohol solution minus the homeopathic dilution were used for placebo, which was identical to verum in taste, appearance, and odor and were dispensed in identical containers. None of the homeopathic practitioners, study personnel, or coinvestigators knew

which subjects had been randomized to which group. The code was not broken until after initial data analysis was completed by the statistician (triple-blind). The randomization code was held in confidence by the pharmacy, but available upon request to a Data Safety Monitoring Board.

## Outcome measures and statistical analysis

The primary outcome measure was the Conners Global Index—Parent (CGI-P), a questionnaire completed by parents at baseline and weekly during the 18 weeks of the study.<sup>17</sup> Several other commonly used and well-validated instruments were used to evaluate each child at baseline, 6, 12, and 18 weeks after the initial homeopathic intervention. These included the Connors Parent Rating Scale—Brief (CPRS-B), Connors Global Index—Teacher (CGI-T), and the Stimulant Side-Effects Checklist, part of the ADHD-Symptom Checklist 4 (ADHD-SC4). 17,18 In addition, each child performed the Continuous Performance Test (CPT) at baseline and at each of the 6-, 12-, and 18-week homeopathic follow-up visits. 19 This 10minute timed test is the most commonly used objective test to monitor medication effects, as well as response to treatment, in clinical trials of ADHD. There are two features measured in this test: omission errors, to evaluate attention, and commission errors, which measure impulsivity. Finally, the homeopathic physicians completed the Clinical Global Impression Scale, a validated measure of illness severity and improvement from treatment on a scale of 1-7, at baseline and each of the follow-up homeopathic visits.<sup>20</sup> As part of this scale, the physician also was asked to state at each visit whether he or she thought the subject received verum or placebo.

Study data were analyzed using SAS Software, Release 8.2 (SAS Institute Inc., Cary, NC, 2001). Baseline mean questionnaire scores and demographic variables were compared between treatment groups. Changes in outcome measure scores in subjects before and after intervention among the two groups were measured using analysis of variance (ANOVA), as the data were continuous and followed a normal distribution and categorical data were analyzed using chi-square statistics.

Repeated measures of ANOVA with one-between subject effect (treatment) and one within-subject effect (time) was performed to determine if there were statistically significant differences in outcome measures. These models controlled for baseline measures (age, severity of disease, and conventional medication use). In addition, the combined effects of independent variables and intervention on outcome measures in subjects before and after the intervention were assessed with multivariable models using analysis of covariance (ANCOVA), controlling for demographic variables. All analyses were by intention-to-treat (an analysis of only those who completed the study found no differences in results). A two-tailed alpha of less than 0.05 was considered statistically significant.

#### RESULTS

Fifty-five children were assessed for eligibility and 43 were randomized into the study. Of these, 37 completed all study interventions, with 2 dropouts in the homeopathy group, 3 dropouts in the placebo group, and 1 placebo-group subject lost to follow-up (Fig. 1). Of the 43 children originally randomized, 9 were currently taking stimulant medications (5 in the homeopathy group and 4 who received placebo). A comparison of demographic characteristics and baseline values found no significant differences between the two groups (Table 1). It is of note that the baseline T-scores for both inattention and impulsivity on the CPT were within the average range for both groups, while the values of the parent and teacher assessments were in the moderate to markedly atypical range (Table 2).

There were 41 different remedies prescribed during the course of the study, taking into account the remedy changes that occurred at the 6- and 12-week visits. The most frequent prescriptions were *Medorrhinum* (4), *Saccharum officinalis* (4), *Calcarea carbonica* (3), *Calcarea phosphorica* (3), *China officinalis* (3), and *Stramonium* (3). There were seven remedy changes in the homeopathy group compared to 11 changes in the group receiving placebo, while the same remedy was given for the entire course of the study in 12 subjects in the homeopathy group compared to 10 in the placebo group.

There were no statistically significant differences between homeopathy and placebo groups on the primary outcome variable, the Conner's Global Index—Parent, nor in any other of the parent, teacher, homeopath, or computer-assisted child outcomes (Table 3). However, there were statistically significant differences between baseline and the end of the study in both of the groups. The CGI showed a

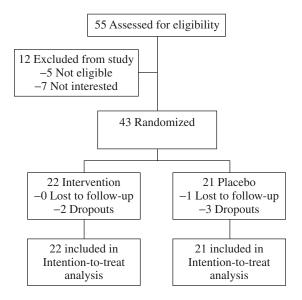


FIG. 1. Study participant flow chart.

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Table 1. Baseline Characteristics and T-scores (Mean ± SD Unless Otherwise Noted)

	Homeopathy group $(n = 22)$	Placebo group (n = 21)
Age	$9.50 \pm 1.75$	$9.00 \pm 2.00$
Gender male, $n$ (%)	16 (72.7)	17 (81.0)
Taking stimulant medication, $n$ (%)	5 (22.7)	4 (19.0)
Connors Parent Rating Scale—Revised		
Oppositional	$64.55 \pm 14.77$	$63.53 \pm 12.46$
Inattention	$67.55 \pm 14.02$	$69.35 \pm 9.53$
Hyperactivity	$74.70 \pm 11.42$	$74.47 \pm 13.18$
ADHD index	$70.45 \pm 10.65$	$70.41 \pm 7.36$
Connors Global Index—Parent		
Restless/impulsive	$69.35 \pm 13.61$	$71.25 \pm 7.50$
Emotional lability	$60.71 \pm 15.18$	$61.31 \pm 14.77$
Global Index total	$67.88 \pm 13.77$	$69.88 \pm 9.63$
Connors Global Index—Teacher		
Restless/impulsive	$73.40 \pm 11.51$	$71.29 \pm 12.86$
Emotional lability	$53.47 \pm 9.21$	$50.93 \pm 10.98$
Global Index total	$68.80 \pm 10.78$	$66.14 \pm 11.88$
Continuous Performance Test		
Inattention	$52.47 \pm 12.12$	$49.71 \pm 7.51$
Impulsivity	$51.10 \pm 9.89$	$49.60 \pm 13.70$

SD, standard deviation; ADHD, attention-deficit/hyperactivity disorder.

statistically significant improvement in all of the subtests in the placebo group and in the restless/impulsive measure in the homeopathy group (p < 0.05; Fig. 2). Similarly, there was a significant improvement of both the ADHD index and the Hyperactivity scores of the Conner's Parent Rating Scale when compared to baseline in both treatment groups, which was highly significant for the ADHD index by week 18 (p < 0.01; Table 4). These changes in T-scores were clinically significant (i.e., they decreased from "markedly atypical" (>70) to "mildly atypical" (<65; Table 2).

The Conner's Global Index for Teachers improved significantly from baseline in the placebo group but not for the group receiving homeopathy. Inattention scores on the Continuous Performance Test worsened significantly in both groups by the end of the study, while there was no significant change in impulsivity. The Stimulant Side Effects Checklist showed no significant differences, and there were no adverse effects reported by either group.

There were no differences between homeopathy and placebo groups in the homeopaths' evaluation of change in severity of illness or improvement of illness on the Clinical Global Impressions Scale over the course of the study. However, when asked to which treatment group each subject was assigned, the homeopaths guessed correctly in 17 subjects (12 homeopathy, 5 placebo), incorrectly in 17 (6 homeopathy, 11 placebo), and stated they were not sure in 3 (p < 0.05).

#### **DISCUSSION**

This pilot study failed to find a difference between homeopathic remedy and placebo in the treatment of ADHD. However, subjects in both groups improved significantly over the course of the study, as measured by the change in many of the parent and teacher evaluations from baseline to the 18-week follow-up. In addition, there were consistently stronger improvements in the placebo group, which is the opposite from what one might expect. Because betweengroup differences were not significant, this is best viewed as a statistical fluke.

A clinically significant improvement in both treatment groups has been reported in other trials of homeopathy, as

Table 2. Interpretive Guidelines for T-Scores and Percentiles<sup>a</sup>

T-score	Percentile	Guideline
70+	98+	Markedly Atypical (Significant problem)
66–70	95–98	Moderately Atypical (Significant problem)
61–65	86–94	Mildly Atypical (Possible Significant problem)
56–60	74–85	Slightly Atypical (Borderline: Raise concern)
45–55	27–73	Average (Typical: Should not raise concern)

TABLE 3	COMPARISON	OF T-SCORES AT	18 Weeks in	HOMEOPATHY	AND PLACERO (	POLIES
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		Mean T-score (SD); S	tudent's t-test	
Variable	Homeopathy	Placebo	p value	95% CI
$\overline{\text{CPRS-R} (n = 37)}$				
Oppositional	$64.05 \pm 13.17$	$62.65 \pm 14.39$	0.76	(-7.8, 10.6)
Inattention	$64.55 \pm 15.59$	$59.47 \pm 8.84$	0.22	(-3.6, 13.8)
Hyperactivity	$67.40 \pm 14.96$	$64.35 \pm 13.51$	0.52	(-6.6, 12.6)
ADHD index	$63.65 \pm 13.88$	$61.65 \pm 8.82$	0.61	(-5.9, 9.9)
CGI-Parent $(n = 37)^*$ ,				
Restless/impulsive	$63.25 \pm 14.97$	$62.94 \pm 10.82$	0.94	(-8.6, 9.2)
Emotional lability	$58.05 \pm 15.24$	$55.06 \pm 12.74$	0.53	(-6.5, 12.5)
Global Index total	$62.65 \pm 14.96$	$60.88 \pm 12.07$	0.70	(-7.4, 11.0)
CGI-Teacher $(n = 37)$				, , ,
Restless/impulsive	$67.26 \pm 12.14$	$62.25 \pm 13.03$	0.25	(-3.7, 5.0)
Emotional lability	$52.16 \pm 8.96$	$48.31 \pm 9.31$	0.22	(-2.5, 3.9)
Global Index total	$63.53 \pm 11.16$	$58.81 \pm 11.66$	0.23	(-3.2, 12.6)
CPT $(n = 43)^{\dagger}$				
Inattention	$61.59 \pm 15.97$	$63.60 \pm 16.51$	0.56	(-6.3, 11.5)
Impulsivity	$56.38 \pm 13.33$	$57.42 \pm 14.79$	0.74	(-7.0, 9.7)

SD, standard deviation; CPRS-R, Connors Parent Rating Scale-Revised; ADHD, attention-deficit hyperactivity disorder; CGI; Connors Global Index; CPT, Continuous Performance Test.

Notes: \*assessment at 17 weeks; †occasional missing; CI indicates confidence intervals.

well as allopathic treatments for ADHD,<sup>21–24</sup> and has been attributed to a combination of factors, including the placebo effect and regression to the mean. It also suggests that there may be some healing effect in the homeopathic process itself, which is not related to the remedy per se. This "non-local" effect of homeopathy includes the complicated interaction of setting, patient interview, remedy selection, and

understanding of the case by the homeopathic physician. <sup>25–28</sup> We had planned to explore this concept by enrolling a third cohort of children who would receive a placebo and no homeopathic consultation, but this arm was not approved by the Yale Human Investigations Committee. Another research group is actively exploring this concept, and we look forward to their results. <sup>29</sup>

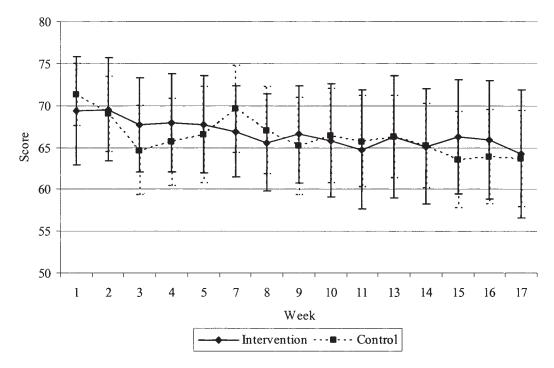


FIG. 2. Restless/Impulsive scores as measured by the Conner's Global Index.

Table 4. Comparison of Change in T-Scores from Baseline to 18 Weeks in Homeopathy and Placebo Groups

			Mean T-score difference (SD); paired t-tests	SD); paired t-tests		
Variable	Mean difference baseline/homeopathy	p value	95% CI	Mean difference baseline/placebo	p value	95% CI
CPRS-R $(n=37)$						
Oppositional	$-0.5 \pm 14.6$	0.880	(-7.3, 6.3)	$-0.9 \pm 12.9$	0.780	(-7.5, 5.8)
Inattention	$-3.0 \pm 11.3$	0.250	(-8.3, 2.3)	$-9.9 \pm 12.4$	0.005	(-16.2, -3.5)
Hyperactivity	$-7.3 \pm 15.5$	0.050	(-14.55, -0.05)	$-10.1 \pm 16.4$	0.020	(-18.5, -1.7)
ADHD index	$-6.8 \pm 9.8$	900.0	(-11.4, -2.2)	$-8.8 \pm 11.4$	0.006	(-14.7, -2.9)
CGI-Parent $(n = 37)$ *,						
Restless/impulsive	$-4.9 \pm 9.4$	0.045	(-9.8, -0.1)	$-8.3 \pm 10.6$	0.007	(-14.0, -2.7)
Emotional lability	$-2.3 \pm 13.7$	0.500	(-9.3, 4.7)	$-6.3 \pm 13.3$	0.080	(-13.4, 0.8)
Global Index total	$-4.2 \pm 10.7$	0.120	(-9.7, 1.3)	$-9.1 \pm 12.6$	0.010	(-15.8, -2.3)
CGI-Teacher $(n = 37)$						
Restless/impulsivity	$-4.8 \pm 12.7$	0.170	(-11.8, 2.2)	$-11.1 \pm 11.1$	0.002	(-17.6, -4.7)
Emotional lability	$-1.6 \pm 9.1$	0.510	(-6.6, 3.4)	$-3.1 \pm 9.3$	0.240	(-8.4, 2.3)
Global Index total	$-4.3 \pm 11.7$	0.170	(-10.8, 2.2)	$-9.1 \pm 10.5$	900.0	(-15.2, -3.1)
$CPT (n = 43)^{\dagger}$						
Inattention	$9.9 \pm 16.1$	0.010	(2.5, 17.2)	$13.5 \pm 16.6$	0.003	(5.3, 21.8)
Impulsivity	$9.7 \pm 12.6$	0.002	(4.0, 15.4)	$9.3 \pm 20.9$	0.080	(-1.1, 19.7)

SD, standard deviation; CPRS-R, Connors Parent Rating Scale-Revised; ADHD, attention-deficit hyperactivity disorder; CGI; Connors Global Index; CPT, Continuous Performance Test.

Notes: \*assessment at 17 weeks; †occasional missing; CI indicates confidence intervals.

Study limitations

Insufficient statistical power is always a consideration in a small pilot study such as this, but the direction of effect favoring placebo mitigates against a therapeutic advantage for the homeopathic remedy that was concealed by a type II error. It is possible that the 18-week duration of the study was too short to evaluate the response to the homeopathic remedy. In actual practice, homeopaths report that it sometimes takes 6 months to see results in cases such as these. <sup>13,14</sup> In addition, not knowing whether a child had received a remedy or placebo and/or the pressure of being in a short-term study could have altered the homeopaths' practice style, causing more frequent remedy changes or repetitions of the dose.

While all children were confirmed as having ADHD using the DISC-IV instrument and also had moderately to markedly atypical T-scores on parent and teacher questionnaires, it is troubling that the scores on the CPT were in the average range at entry into the study and that the inattention scores became worse over time. Future studies should consider using an atypical score on the CPT as one of the entry criteria in order to better evaluate objective changes in the child's attention over time.

One could question whether the experience and remedy choices of the study's two homeopathic physicians were representative of everyday homeopathic practice. In this study, the physicians were highly experienced in the treatment of ADHD and used a wide variety of homeopathic remedies. However, they did employ a relatively new method of prescribing that has become more widespread over the past 10 years. Future studies should include a wider variety of homeopathic methods and a larger number of physicians. We would not suggest the use of supervised prescribing or group decision-making in such a study, as our aim is to replicate as closely as possible what is happening in actual clinical practice.

## **CONCLUSIONS**

In this 18-week pilot study of ADHD using classical homeopathy, there were no significant differences between those subjects who received a remedy and those receiving placebo, which does not confirm a specific effect of homeopathic remedies in this disorder. However, all children improved both statistically and clinically, suggesting that there may be some therapeutic value to the homeopathic approach to ADHD.

Larger studies to further explore this subject should be carried out over a longer period of time and should include a control group that does not receive the homeopathic consultation. Consideration also should be given to comparing the homeopathic approach to stimulant medications. Parents and children could benefit greatly from a nonpharmaceutical approach to this complex problem.

#### **ACKNOWLEDGMENTS**

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Address reprint requests to: David Katz, M.D., M.P.H. Yale Prevention Research Griffin Hospital, 2nd Floor 130 Division Street Derby, CT 06418

E-mail: katzdl@pol.net

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