

## A Pilot Study of *Qigong* for Reducing Cocaine Craving Early in Recovery

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### Abstract

**Objectives:** This pilot study examined the feasibility, preliminary efficacy, and determined the effect sizes of external *qigong* therapy (EQT) in reducing cue-elicited cocaine craving and associated symptoms among recently abstinent cocaine-dependent (CD) individuals.

**Methods:** This study randomized 101 CD subjects to either a real EQT ( $n=51$ ) or sham EQT control ( $n=50$ ) group. Subjects underwent a baseline assessment and a weekly cue-exposure session for 2 weeks. Total EQT or sham treatments ranged from 4 to 6 sessions in 2 weeks.

**Results:** EQT-treated subjects displayed a greater reduction in cue-elicited craving ( $p=0.06$ ) and symptoms of depression ( $p<0.05$ ) with medium effect sizes.

**Conclusions:** This study demonstrated the feasibility of delivering EQT among CD individuals early in residential treatment. Future research should include a larger sample and examine the mechanisms and potential longitudinal benefits of EQT.

### Introduction

COCAINE IS ONE OF THE MOST REINFORCING illicit drugs, with few effective treatments. Complementary and alternative medicine (CAM) interventions including external *qigong* therapy (EQT) have been pilot tested for augmenting drug abuse treatments with some promise.<sup>1</sup> EQT is a form of energy medicine in which a trained EQT healer directs *qi* (bioenergy) and *yi* (healing intention) to a patient to help remove *qi* blockage and achieve inner balance. This approach has not been studied specifically in cocaine addiction and could hold promise in reducing cocaine craving, a symptom thought to play a role in relapse. Thus, the current pilot study explored the feasibility and preliminary efficacy, as well as determined effect sizes for future planning of research with EQT in reducing cue-induced cocaine craving in recently abstinent cocaine-dependent (CD) individuals.

### Materials and Methods

This double-blind, placebo-controlled trial involved a sample of 101 recently abstinent CD individuals, who were

randomized to EQT ( $n=51$ ) or a sham EQT treatment ( $n=50$ ) to reduce cue-elicited craving and acute withdrawal symptoms early in residential substance abuse treatment. This study was approved by an Institutional Review Board, and subjects provided informed consent. Subjects were included if they (1) had a Diagnostic and Statistical Manual (DSM)-IV diagnosis of cocaine dependence; (2) were in residential substance abuse treatment; (3) showed increased craving in response to laboratory drug cues; and (4) were English speaking. Subjects were excluded if they (1) met DSM-IV criteria for opiate, barbiturate, alcohol, or marijuana dependence, as well as if they reported a drug other than cocaine as their principal drug of dependence; (2) met DSM-IV criteria for another Axis I psychiatric disorder besides cocaine dependence; (3) were taking medication that could affect their central nervous system; and (4) had recently received *qigong* therapy.

After meeting eligibility criteria, subjects had a baseline assessment, initiated 2 weeks of *qigong* or sham treatment, and underwent a cue-exposure procedure at week 1 and week 2. The assessment measures included the Cocaine Craving Questionnaire Brief (CCQ)<sup>2</sup>; Voris Cocaine Craving

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Scale (VCCS)<sup>3</sup>; Spielberger State-Trait Anxiety Inventory–State only<sup>4</sup>; Beck Depression Inventory (BDI)<sup>5</sup>; Credibility/Expectancy Questionnaire<sup>6</sup>; and Addiction Severity Index (ASI).<sup>7</sup>

### Cue-Exposure Procedure

During cue-exposure, subjects were seated in a comfortable chair with dim lighting in an effort to increase the subject's attention to the procedure. Subjects completed within each session the VCCS and CCQ before and after each cue presentation. The neutral (e.g., pine cone) and active (e.g., crack pipe) cues were presented to the subject in videotapes that showed a person handling items. Subjects were also asked to handle these same items following the presentation of the videotape. These procedures are described in more detail in the authors' previous work.<sup>8</sup>

### Qigong and Sham-Healing Procedures

This study included two EQT healers. One was female who practiced *qigong* for 10 years, and the second healer was male, a licensed acupuncturist, with 12 years of experience delivering medical EQT. The three sham healers were neither familiar with the practices of *qigong* nor practiced any CAM interventions themselves. The *qigong* and sham healers followed the same structured protocol, based on common EQT practices and theoretical constructs of Traditional Chinese Medicine, which also included not facing or talking to the subject in order to maintain the blind (Table 1).

Subjects were randomized by a trained research assistant (RA) to 1 of 2 groups based on a random numbers table. A scheduler would contact the participants and the healers to arrange the real healer or sham sessions. The subjects and RA conducting the assessments were blind to treatment conditions. To maintain double-blind randomization, subjects in either condition were escorted into a treatment room by a study RA and told that a "healer" would enter upon the RA leaving. The RA escort was not involved in the cue exposure procedure. Subjects were escorted into the same treatment room regardless of treatment condition. Subjects were seated facing the wall and were instructed not to talk to the healer or look back. Once the RA escort left, an EQT or sham healer would follow and remain in the room for 15 minutes. The EQT and sham healer replicated the same procedures for each session (Table 1). Subjects were offered two to three 15-minute EQT or sham healing sessions per week, for 2 weeks (up to four to six treatments). Treatments were scheduled every other day.

### Analytic Strategy

SPSS version 18 was used to analyze the data. All subjects were included in the descriptive analysis and regression model except for those who dropped out after baseline screening. Analysis of variance was first applied to get the general trend in improvement or group differences, followed by a generalized estimate equations (GEE) model to determine the significance of group differences in outcomes, with control for potentially confounding variables. Since the GEE model takes into consideration the baseline differences, the correlations among repeated measures, and missing values, it is the most appropriate method for data analysis in clinical

studies with missed assessments and was used for most of the treatment outcome measures. Given the pilot and exploratory nature of this study with a small sample, the outcomes were presented both with and without controlling for baseline group differences, and  $p \leq 0.10$  was considered as marginally significant, and  $p \leq 0.05$  as statistically significant in the report of the outcomes.

### Results

Among the 101 subjects enrolled, 51 were randomly assigned to EQT and 50 to a sham control. Of the 101 subjects, 15 (9=sham, 6=EQT) were excluded from analysis since they were missing both week 1 and week 2 assessments. Despite randomization, significant baseline group differences were observed: Subjects in EQT were younger ( $p=0.05$ ) and had a higher ASI drug use composite score ( $p=0.01$ ). Table 2 presents the basic demographic variables and baseline differences in key outcome variables.

The primary outcome was cue-elicited craving, defined as the difference between reported VCCS craving scores after exposure to neutral and active cues. An analysis of variance on the change in mean difference (from neutral cue to active cue) indicated that the EQT subjects showed marginally significant reductions in cue-elicited craving ( $p=0.06$ ) by the end of week 2 (from 20.4 to  $-0.2$ ) compared to the sham control group (from 19.0 to 4.12) (Table 3); the effect size  $d$  is around 0.42. A mixed-effect regression model applied to the secondary outcomes, with baseline measure as one of the predictors and individual participant as a random effect, showed that subjects in EQT reported a significantly greater reduction in BDI score ( $p < 0.05$ ) compared to those in sham control over the 2-week period after taking baseline differences into account (Table 4). However, when adding age and ASI Drug Use Severity as covariates into the model, the observed effects diminished in craving, anxiety, and depression (Table 4). The raw effect size ( $d$ ) for each secondary outcome is 0.46 (BDI), 0.46 (anxiety), and 0.30 (craving). Subjects in EQT also attended significantly more treatment sessions than those in sham control (5.41 versus 4.46;  $p < 0.01$ ). Lastly, although every effort was made to keep both the RA and subject blind to the conditions, subjects in EQT were more likely to report being in the real EQT group compared to those in sham: 51% versus 19% after first treatment ( $p < 0.01$ ); 79% versus 30% after the last treatment ( $p < 0.01$ ).

### Discussion

This pilot study confirmed that EQT is feasible to deliver to individuals with cocaine addiction, with some modest short-term efficacy in reducing cue-elicited craving and other addiction-related symptoms with medium effect sizes compared to the sham. These results are consistent with a prior pilot study, which found that subjects receiving *qigong* meditation (i.e., "internal *qigong*" practice) had significantly higher treatment completion rates and a greater reduction in craving.<sup>9</sup> An interesting finding in the current study was related to the subject's perception of group assignment. Subjects in EQT were significantly more likely to endorse assignment in real EQT compared to sham after the first and last treatment despite the use of standardized healing procedures and significant efforts to maintain the blind. One

TABLE 1. STANDARDIZED HEALING SESSION PROCEDURES FOR QIGONG AND SHAM HEALER

Step	Physical movement	Qigong healer mind/healing activities <sup>a</sup>
1. Instructions	The research assistant (RA) escort guides the subject into the room. The subject is then instructed to close his or her eyes and avoid looking at the healer. The RA escort then leaves the room and the healer enters the treatment room. The healer greets the subject and asks him/her to sit straight on the back of the chair, place both hands on his or her lap, and relax completely.	The healer then scans the subject for a moment to identify his or her problematic areas (e.g., <i>qi</i> blockage, <i>qi</i> imbalance, unhealthy aura).
2. Sense the blockages (1 minute)	The healer places his/her right hand over the subject's head without touching it. He/she then moves his hand around the subject's head from front to back, and then from left to right. These movements are repeated a few times.	The healer imagines that his hand is inside the subject's head. He senses the major areas of <i>qi</i> blockage.
3. Supply with healthy <i>qi</i> (3 minutes)	The healer closes his eyes, takes a deep breath, and then puts both of his/her hands over the top of the subject's head with his palms facing the patient's <i>Bai-hui</i> acupoint (located at the center top of the head).	When the healer inhales, he/she imagines that white energy from the universe is absorbed into his body through the <i>Bai-hui</i> acupoint or through his/her back. When the healer exhales, he/she imagines emitting the white energy through his palms into the subject's body (through <i>Bai-hui</i> acupoint) and then visualizes the strong white <i>qi</i> being pressed through the subject's body from head to feet, driving the sick <i>qi</i> out of the subject.
4. Stimulate acupoints (2.5 minutes)	The healer points the middle and index fingers of his right hand toward the subject's hypnosis acupoint (located in the center of the back of the neck) and then toward the sun acupoints (located on both sides of the head).	The healer applies imaginary acupuncture to stimulate the key acupoints to reduce tension and anxiety.
5. Cleanse the brain (2 minutes)	The healer places his/her palms near each side of the center of the subject's head, without touching him or her, approximately 5 to 8 cm from the surface of the brain. He/she then breathes deeply and moves his palms around the subject's head.	The healer imagines the discharge of strong <i>qi</i> to break <i>qi</i> blockages in the subject's brain. He/she also visualizes the dopamine blockage area in the center of brain turning from black to white and the entire brain becoming crystal clear.
6. Remove sick <i>qi</i> (1 minute)	The healer uses both hands to induce the remaining sick <i>qi</i> out of the subject's body through the subject's fingertips, or from the <i>Yong-chuan</i> acupoint (bottom of feet). The healer first puts his right hand 5 to 8 cm from the top of the subject's head. He/she then moves his right hand from subject's left shoulder along the left arm to the left hand. This is repeated 3 times. The healer then puts his/her left hand 5 to 8 cm from the top of the subject's head. He/she then moves his/her left hand from subject's right shoulder along the right arm to the hand. This is repeated 3 times. The healer then puts both hands 5 to 8 cm from the subject's head and then moves his/her hands from the subject's head to his/her chest, abdominal area, thighs, legs, and finally the feet. This is repeated 3 times.	The healer visualizes the black <i>qi</i> within the subject being induced out from fingertips or from the <i>Yong-chuan</i> acupoint at the bottom of the feet, deep into the earth.
7. Close	The healer says "OK. The treatment has been completed."	

<sup>a</sup>During the healing session, the sham healer will complete all physical movements, but will count mentally from 1 to 100, then count backwards from 100 to 1, and repeat the process for a total of 15 minutes.

TABLE 2. DESCRIPTIVE DATA OF BASELINE DEMOGRAPHICS AND KEY OUTCOMES BY GROUP

Demographics	Total (n=101)	Qigong (n=51)	Sham (n=50)
Male, N (%)	97 (96%)	49 (96%)	48 (96%)
Age, mean yrs (SD)	38.2 (10.8)	36.0 (9.4)	40.4 (11.9)
Race (%)			
White	59.8%	69.4%	50.0%
Black	35.1%	26.5%	43.8%
Others	5.2%	4.1%	6.3%
Religion (%)			
Protestant	33.3%	30.6%	36.2%
Catholic	42.7%	44.9%	40.4%
Others	8.4%	6.1%	10.6%
None	15.6%	18.4%	12.8%
Employment patterns past 3 years			
Full-time	66.0%	66.0%	66.0%
Part-time	14.4%	12.0%	17.1%
Highest grade school completed			
Years (SD)	12.5 (2.1)	12.4 (2.4)	12.5 (1.8)
No. of days paid for working past 30 days (SD)	3.94 (7.5)	3.60 (7.1)	4.30 (8.0)
ASI composite scores			
Medical problem (SD)	0.235 (0.31)	0.211 (0.28)	0.260 (0.34)
Employment problem (SD)	0.683 (0.29)	0.671 (0.32)	0.696 (0.26)
Alcohol use (SD)	0.176 (0.24)	0.181 (0.24)	0.172 (0.24)
Drug use (SD)	0.191 (0.12)	0.221 (0.11)	0.158 (0.12)
Legal problem (SD)	0.236 (0.23)	0.259 (0.24)	0.212 (0.21)
Family/social problem (SD)	0.269 (0.21)	0.309 (0.23)	0.232 (0.19)
Psychologic problem (SD)	0.328 (0.47)	0.383 (0.60)	0.267 (0.23)
No. of years used cocaine lifetime (SD)	13.6 (9.1)	13.2 (8.2)	14.0 (10.1)
No. of days used cocaine past 30 days (SD)	7.8 (10.3)	9.6 (10.7)	5.9 (9.6)
Credibility/expectancy scale (SD)	23.6 (6.7)	23.0 (6.3)	24.2 (7.1)
BDI (Depression) (SD)	13.0 (8.2)	14.0 (7.6)	12.1 (8.6)
Anxiety State (SD)	40.1 (11.7)	41.4 (11.8)	38.8 (11.7)
Cocaine Craving scale (SD)	21.7 (12.9)	22.0 (13.2)	21.4 (12.7)
Completed week 1: N (%)	77 (76.2%)	42 (82.4%)	35 (70.0%)
Completed week 2: N (%)	86 (85.1%)	45 (88.2)	41 (82.0%)

SD, standard deviation; ASI, Addiction Severity Index; BDI, Beck Depression Inventory.

potential explanation is that those receiving EQT treatment felt heat and tingling sensations in their extremities, also reported in other studies involving EQT.<sup>10</sup> An alternative explanation is simply failure to maintain the integrity of the blind to the study conditions.

Given that those randomized to EQT were more correctly able to identify group assignment and showed better outcomes compared to those in the sham control group, it is important to acknowledge that the therapeutic benefits observed in the EQT group could be explained by either the result of the placebo (i.e., nonspecific) effects, or the subject's

actual perception of *qi* energy, which is beyond the scope of this article. It is also important to note that the placebo effect does not necessarily imply that an intervention is fake; it is possible that one's positive beliefs about the therapeutic value of an intervention might actually serve to enhance real therapeutic efficacy. The limitations of this study include a small sample size and short study duration. Furthermore, given that the focus of the study was a pilot feasibility trial, this study only controlled for age and drug use severity, but not all possible baseline differences. Future directions include using the findings to power a larger study, which

TABLE 3. PRIMARY OUTCOMES: CUE-ELICITED CRAVING OUTCOMES OVER TIME BY TREATMENT GROUP

Outcome	Qigong group		Sham group		p-Value <sup>a</sup>
	N	Mean (SD)	N	Mean (SD)	
Four-item combined VAS craving					
Greater change of craving score from neutral cue to active cue (baseline)	45	20.42 (25.2)	41	18.97 (30.0)	0.809
Greater change of craving score from neutral cue to active cue (week 2)	43	-0.19 (9.05)	41	4.12 (11.5)	0.060

<sup>a</sup>F test of between-group difference in one-way analysis of variance. VAS, visual analogue scale.

TABLE 4. PRELIMINARY (UNADJUSTED) SECONDARY OUTCOMES OVER TIME BY TREATMENT GROUP, AND THE RESULTS OF MIXED-EFFECT REGRESSION MODELS FOR REPEATED MEASURES

Outcome measures	Point of measurement	Means (SD)		Coefficient (SE) of group difference (Sham vs. Qigong) in mixed-effect regression with control for baseline measure(s)		
		Qigong (N ≤ 45)	Sham (N ≤ 41)	Model 1 <sup>a</sup> (p-value)	Model 2 <sup>b</sup> (p-value)	Model 3 <sup>c</sup> (p-value)
BDI	Baseline	13.6 (7.0)	11.9 (8.3)			
	Week 1	6.5 (6.7)	7.1 (6.0)	$\beta = 1.935$ (0.91) ( $p = 0.034$ )	$\beta = 1.71$ (0.93) ( $p = 0.07$ )	$\beta = 0.87$ (0.86) ( $p = 0.31$ )
	Week 2	3.7 (4.9)	5.1 (5.6)			
STAI (state only)	Baseline	40.5 (12.0)	38.9 (12.3)			
	Week 1	34.2 (11.6)	34.4 (10.2)	$\beta = 2.528$ (1.63) ( $p = 0.12$ )	$\beta = 2.66$ (1.64) ( $p = 0.10$ )	$\beta = 1.80$ (1.85) ( $p = 0.33$ )
	Week 2	30.2 (10.8)	32.4 (9.2)			
CCQ	Baseline	21.6 (12.9)	20.4 (10.0)			
	Week 1	12.1 (5.2)	13.8 (6.8)	$\beta = 2.031$ (1.21) ( $p = 0.09$ )	$\beta = 2.06$ (1.26) ( $p = 0.10$ )	$\beta = 1.21$ (1.11) ( $p = 0.27$ )
	Week 2	10.8 (2.2)	13.3 (6.9)			

The larger positive beta is in favor of real *qigong* group (with more reduction in outcome measure).

<sup>a</sup>Model 1: The mixed-effect regression models are done with baseline measure of corresponding outcome as one of predictors, individual participant as a random effect, and with control for time to examine group differences.

<sup>b</sup>Model 2, adding age as a covariant into model 1.

<sup>c</sup>Model 3, adding both age and drug use severity at baseline into model 1.

SD, standard deviation; SE, standard error; BDI, Beck Depression Inventory; STAI, State-Trait Anxiety Inventory; CCQ, Cocaine Craving Questionnaire Brief.

might also involve a longitudinal design, more EQT practitioners, an examination of the therapeutic mechanisms of EQT, and additional observations regarding subject perceptions of the intervention, such as videotaping the procedures. Lastly, future work might also include the use of *qigong* self-practice (versus external), which may be more feasible to incorporate into traditional addiction treatment settings, given the limited number of expert healers available and the alignment of self-practice with more traditional addiction treatment approaches.

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