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ORIGINAL ARTICLE

Perception of *Therapeutic Qi*, a Nonmechanical, Nonpsychological Factor in Acupuncture That Originates from the Therapist

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Abstract
So far, most research attempts to explain the mechanism of the action of acupuncture have focused mostly on mechanically-triggered active factors and have produced inconclusive findings. In this study, we investigate whether acupuncture might also involve nonmechanical, nonpsychological active factors originating in the therapist. In 30 individuals, an acupuncture needle was inserted in the acupoint PC6 using a special device without touching the needle. A second device was used to fix the needle rigidly in place, excluding any mechanical transmission of movement from the handle to the needle's tip. Each participant was exposed in random order to a control and a stimulation phase. During the stimulation phase, the free needle's end was held by the therapist to allow the transmission of Qi; during the control phase, it was left untouched. Participants' subjective sensations during the stimulation phase and the control phase were recorded using a questionnaire. Twenty-two of 28 (79%; $p = 0.003$) test

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participants believed that they had received stimulation when it had actually been performed, and 26 (93%; $p < 0.001$) sensed differences between the two experimental phases. Thus, participants were able to sense the transmission of *therapeutic Qi* in the absence of mechanical or psychological factors.

1. Introduction

The specific *effectiveness* of acupuncture in the treatment of certain disorders has been demonstrated in clinical trials, meta-analyses, and reviews conforming to the Cochrane criteria [1—4]. To date, research has focused on the *mechanism of action* for acupuncture [5—15], but no compelling explanations have been given to account for the efficacy of acupuncture [16]. Most research has been dedicated to neurological [5,6], molecular [7—11], and mechanical [12—15] processes that may be mechanically triggered by needling treatment. However, according to the understanding of Chinese medicine, the effectiveness of acupuncture resides in Qi, a term or concept that has no equivalent in western culture [17,18]. The fact that modern needle stimulation, which requires no real participation from the therapist, is different from traditional acupuncture therapy has also been discussed [19]. Patients report different sensations when an acupuncture needle is inserted and manipulated. These sensations are subsumed and have been researched under the term De Qi [18].

De Qi sensations have also been described discriminately by therapists [20]. According to the Ling Shu [21], the foremost classic on acupuncture in the literature of Chinese medicine, trained acupuncturists control the *flow of Qi* through their fingertips. In Chinese medicine, Qi is neither thought of as a material nor is its effectiveness thought of as residing in mechanical, active factors; nevertheless, to date, almost no research has addressed the nonmaterial aspects originating in the therapist.

The purpose of this study was, therefore, to investigate whether this form of Qi—hypothetically referred to here as *therapeutic Qi*—can be sensed by test participants when psychological and mechanical influences are ruled out or controlled. To this end, we have recently introduced two novel devices. One allows the insertion of an acupuncture needle without touching it; the other holds the needle in place and prevents transmission of movements from the handle to the tip of the needle [22].

2. Materials and methods

This experimental, controlled, randomized, single-blinded, two-phase crossover study included 30 test participants.

As shown in Fig. 1, participants lay on a treatment table and extended their right lower arm past a screen, placing it

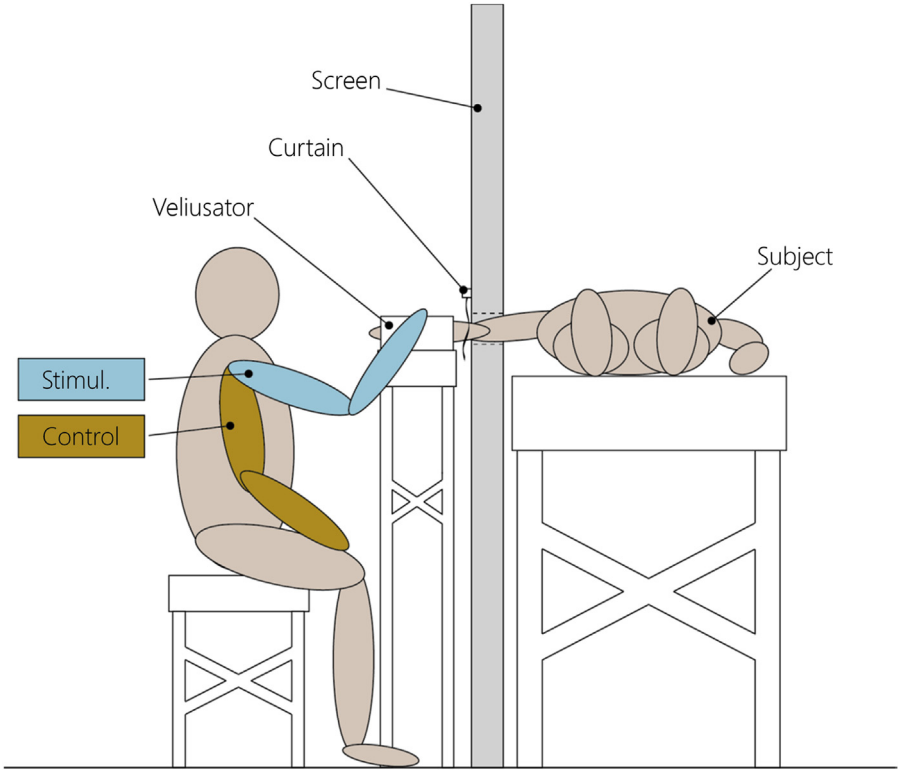

Figure 1 The experimental setup.

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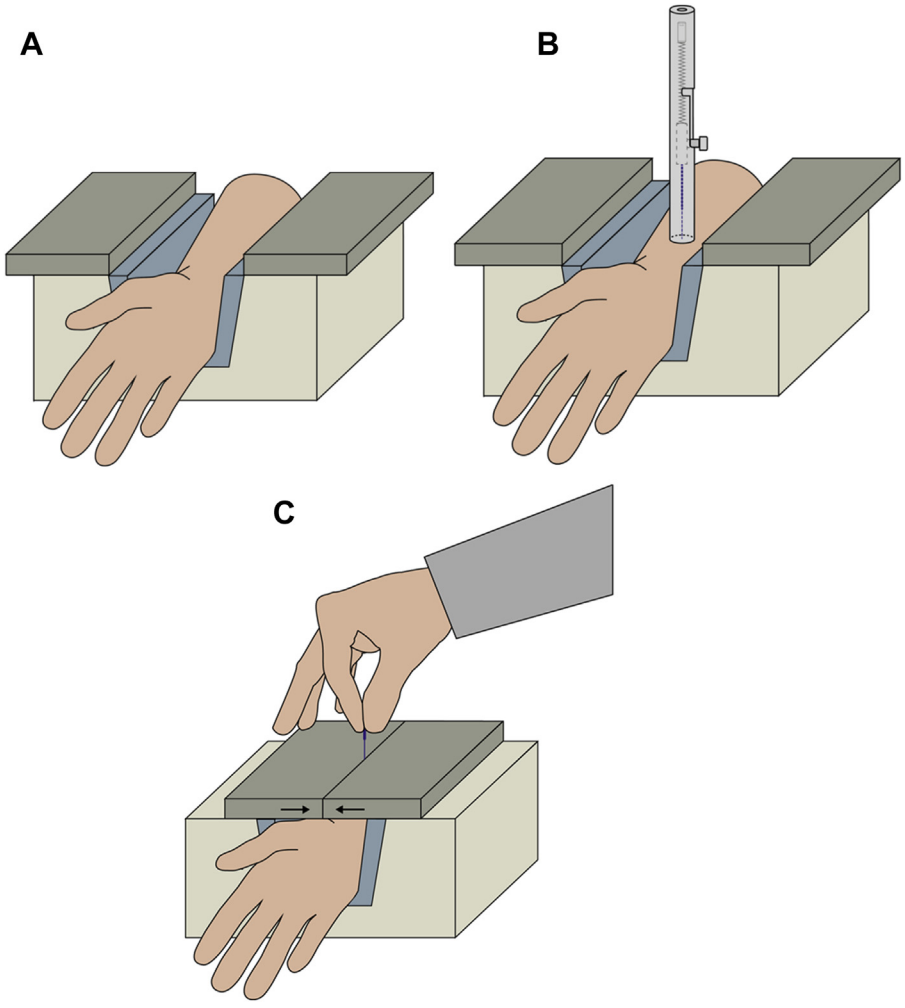

Figure 2 (A) Right forearm placed in the open Veliusator, (B) insertion of the needle in PC6 by using the Acuplicator, and (C) inserted needle retained in place by the Veliusator while being held by the therapist.

on a device referred to as the Veliusator (Fig. 2A). Then, an acupuncture needle was inserted in the acupoint PC6 by using another device referred to as the Acuplicator (Fig. 2B). The Acuplicator allows the researcher to insert needles without touching them and to ensure a mean insertion depth of 12.3 mm [22]. The needle was gripped by the two clamping jaws of the Veliusator, leaving only the end of the needle protruding so that it could be touched during the treatment phase (Fig. 2C). The Veliusator was used to fix the needle rigidly in place, excluding any mechanical transmission of movement from the handle to the tip of the needle [22].

Sterilized disposable acupuncture needles from the manufacturer Haeng Lim Seo Won (Kyungki-Do, Korea) were used. The needles' dimensions, including the steel spiral wire handle, were 0.30 mm × 59.8 mm. The polyethylene guide tubes (0.18/0.28 mm × 55 mm) were cut to 46.8 mm for the experiment.

Fig. 3 shows the test procedure on a time axis. The procedure consisted of two randomly assigned 2-minute phases (stimulation and control phases); the starting and the ending times of the phases were determined using an automatic acoustic signal. During the treatment intervention, the therapist held the end of the needle between their thumb and index finger with the intention of stimulating the acupoint with therapeutic Qi as in daily clinical practice, but without lifting, thrusting or rotating the needle, which was firmly fixed by the Veliusator. During the control intervention, the end of the needle was untouched so that there was no stimulation with therapeutic Qi. Because this study had a crossover design, all participants experienced both interventions and had to decide which phase was with and which was without touch and stimulation. After the experiment, the test participants recorded their subjective sensations on a questionnaire that contained the following four multiple choice questions:

1. Which phase was more intense/stronger (Phase 1 or Phase 2)?
2. Which phase was more eventful (Phase 1 or Phase 2)?
3. In which phase do you believe the needle was stimulated (Phase 1 or Phase 2)?
4. The two phases were indistinguishable/subtly distinguishable/clearly distinguishable.

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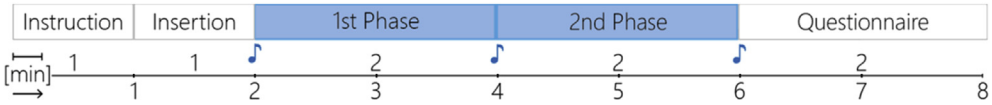

Figure 3 Test procedure.

There were fields for comments on sensations in Phase 1 and Phase 2, as well as a field for general comments.

Data were arranged anonymously and statistically evaluated using SPSS (Version 21; IBM, Armonk, NY, USA) and the Chi-squared test. Results with $p < 0.05$ were considered statistically significant.

In this study, the therapist (R.J.H.) was a trained acupuncturist and a supervisor with approximately 10 years of professional experience. The test participants ranged in age from 23 years to 56 years; 27 were female and three were male. They were recruited as volunteers from the students and the staff of the Tao Chi Swiss School of Chinese Medicine in Zürich. The research proposal was submitted to the regional ethics committee (ethics committee of the canton of Zurich). The proposal was deemed exempt from formal evaluation, and no ethical concerns over conducting the study were raised. Written informed consent was obtained from all volunteers, and all data were made anonymous before analysis.

3. Results

Table 1 shows when participants' subjective sensations coincided with the treatment or nontreatment they had undergone. Twenty-two of 28 (79%; $p = 0.003$) test participants believed that they had received stimulation in the phase in which it had actually been performed, six participants believed that they had received stimulation in the phase in which it had not been performed. Twenty-six of 28 participants (93%; $p < 0.001$) sensed a difference between the two phases (Table 2). Two participants did not fill out the relevant fields in the questionnaire.

Participants were also invited to comment in the questionnaire on their experiences during the two phases and on the trial in general. A total of 41 comments were entered in different fields of the questionnaire, including 15 comments on Phase 1, 15 comments on Phase 2, and 11 general comments. The following words were used more than once in these comments (translated from German to English according to: Translation of the SQSN [23]): relaxing/relaxed/more relaxed ($n = 6$), hand/palm of hand including fingers ($n = 6$), arm ($n = 7$), tingling ($n = 5$), numbness/paralyzing/dull ($n = 5$), stabbing ($n = 3$), aching/slightly aching ($n = 3$), warmth/heat ($n = 3$), electricity ($n = 2$), impulses ($n = 2$), and flow of energy ($n = 2$). Four participants noted during the treatment phase sensations that spread longitudinally or over their entire arm.

Table 1 Concurrence between test participants' sensation and the treatment intervention.

	Number of correct guesses (total guesses)			% in	p^*
	1st phase	2nd phase	Both phases	both phases	Both phases
More intense/stronger	10 (15)	7 (11)	17 (26)	65	0.117
More eventful	10 (13)	10 (15)	20 (28)	71	0.023
Guess when treated	10 (10)	12 (18)	22 (28)	79	0.003

* Chi-squared test.

4. Discussion

Of the participants, 79% were correct in their judgment as to the phase in which the therapist had touched the end of the needle. 93% of the participants found the two phases of treatment and control intervention to be subtly or clearly distinguishable. Involvement of psychological or mechanical factors can be excluded due to the crossover design and the equipment used. Thus, we can conclude that the participants were able to sense an influence originating from the therapist, which is referred to as therapeutic Qi. This is a potentially significant factor in acupuncture treatment and deserves to be further investigated and taken into account in clinical studies.

Several large-scale acupuncture studies in which only small differences were found between verum and sham acupuncture treatment have been performed [24,25]. The challenges inherent in this type of study have been described elsewhere [26]. We hypothesize that therapeutic Qi might have contributed as an active factor to the indeterminate differences between the outcomes in the verum and the sham acupuncture groups.

In previous studies on the effectiveness of acupuncture, a common practice has been to include patients with no prior experience in receiving acupuncture treatment. By contrast, in this study, all but one participant had received acupuncture treatment before, and only this inexperienced participant was unable to report having had any subjective sensations during either phase. Whether or not experience is a determining factor for a person's ability to sense therapeutic Qi could be investigated by replicating the study with two distinct groups: one with and one without prior experience in receiving acupuncture treatment. That the transmission of therapeutic Qi depends on the acupuncturist's training and/or experience, a factor that could be investigated in future research, is also conceivable.

Participants were invited to comment on the questionnaire about their experiences during the two phases. Intersection of all terms found more than once in these comments with expressions commonly used in standardized questionnaires [18,23,27] to describe sensations of De Qi yielded the following subset: tingling, numbness, dull, aching, warmth and stabbing. Thus, the participants sensed De Qi even in the absence of mechanical stimulation. The

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Table 2 Subjective distinguishability of the two phases.

	Responses per category	Total responses	Responses per category (%)	p*
Indistinguishable	2	28	7	
Subtly distinguishable	10	28	36	
Clearly distinguishable	16	28	57	0.05†
Subtly or clearly distinguishable	26	28	93	<0.001‡

* Chi-squared test; † this p-value is a measure of whether the distribution of responses across the three categories *indistinguishable*, *subtly distinguishable*, and *clearly distinguishable* was significantly different from random; ‡ this p-value is a measure of whether the distribution of responses across the two categories *indistinguishable* and *subtly or clearly distinguishable* was significantly different from random.

phenomenon of Qi transmission has been little investigated to date. However, *in-vitro* experiments have shown that *external Qi* arising during the practice of Qi Gong can induce apoptosis in cancer cells [28—30]. The experimental setup used in this study can also serve not only to explore whether therapeutic Qi can be sensed subjectively but also to make physiological measurements accessible. One method well suited for investigating subtle influences on the human organism, for example, is heart rate variability [31,32].

Conflicts of interest

The authors affirm there are no conflicts of interest and the authors have no financial interest related to the material of this manuscript.

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