

## The contributions of hypnoacupuncture analgesia to pain-related variables

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### Research Article

**Abstract:** Investigate the analgesic effect of hypnoacupuncture by using various pain-related variables for assessment. By adopting a data collection method and an induction method, this study identified five pain-related variables (i.e., pain intensity, pain duration, pain frequency, pain sensation, and pain area) that influenced hypnoacupuncture analgesia. A six-month clinical experiment was conducted, in which different combinations of hypnoacupuncture analgesia-based treatments were administered. The clinical experiment consisted of a Traditional Chinese Medicine (TCM) acupuncture group (who received hegu acupuncture point treatment, i.e., acupuncture treatment by using the acupuncture point of hegu), a hypnosis group, a combination group (who received a combination of TCM acupuncture point treatment and the hypnosis treatment), and a control group. Each group received three courses of treatment that lasted a total of ten days. The participants completed a Wong–Baker FACES pain rating scale that measured the five pain-related variables. The experiment results were analyzed using an SPSS software package, in which dependent t tests, independent t tests, and ANOVA were performed. 1) In terms of pain intensity, significant changes were observed in the hypnosis group and the combination group, indicating that the two methods featured the advantages of alleviating pain intensity and sustaining the pain relief effect; and 2) In terms of pain sensation, significant changes were observed in the TCM acupuncture group, suggesting that it possessed the advantage of reducing pain intensity. The following conclusions were derived according to the experiment results: 1) Clinically, hypnosis techniques as well as the hegu acupuncture point-based treatment can alleviate acute sore throat; 2) Clinically, hypnoacupuncture analgesia can enhance the pain relief effect of acute sore throat; and 3) Hypnoacupuncture analgesia significantly affected pain intensity, in which it features the advantages of alleviating pain intensity and sustaining the pain relief effect.

**Key words:** Hegu acupuncture point analgesia; hypnotic analgesia; hypnoacupuncture analgesia.

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**Received:** February 2 2017; **Accepted:** December 27 2017; **Published:** December 31 2017

**doi:** <http://dx.doi.org/10.18088/ejbmr.3.4.2017.pp1-4>

### Introduction

According to the American Psychological Association (APA), hypnosis is a guidance technique used to change perception, thinking, or behavior. In 1996, the National Institutes of Health in the United States indicated that hypnosis can help patients with cancer or other chronic diseases relieve their pain (1). Hypnosis can effectively relieve pain when the cause of pain is clear. Hypnosis as a pain treatment method has been recognized by the American Medical Association, American Psychiatric Association, and APA (2). Hypnosis applied in medical care is called medical hypnosis; in China, numerous articles related to *Huangdi Neijing* (The Emperor's Inner Canon) have discussed traditional Chinese medicine (TCM) psychology (3). Despite the increase of available medications and physical therapies for pain relief, it is still an evolving field in medicine on effective pain management for even more complicated conditions involving both physically and mentally. Insight to the underlying mechanisms of pain and clinical evidences of the use of acupuncture as integrated or alternative therapy for chronic and acute pain relief are presented in several articles organized in a special issue (4). In addition, fMRI studies are conducted to demonstrate the effect of brain activation in response to acupuncture needle manipulation for pain relief (5).

However, little attention has been paid in TCM clinical applications concerning the integration of the body with the mind. Western medicine experts have long misunderstood

medical hypnosis or acupuncture analgesia and believed that medial hypnosis or acupuncture analgesia only provide a placebo effect. In the present study, we conducted a clinical experiment to verify whether there exists clinical evidence of hypnoacupuncture analgesia effects that can serve as a reference for promoting the clinical application of TCM combined with medical hypnosis for pain relief.

### Materials and Methods

In this study, we applied various hypnoacupuncture analgesia methods for a six-month clinical experiment. A total of 31 participants participated in this experiment. Each experimental group participated in a complete experimental process that lasted ten days. The clinical experimental methods and procedures are described as follows.

#### Selection criteria

##### A. Physiological conditions

- Age: active retired elderly Americans aged 60 to 65 years.
- Gender: 15 men and 16 women (31 participants in total; 2 participants withdrew from the study.)
- Prior acupuncture experience: all participants had prior acupuncture experience (seven participants had sensed needles used in the acupuncture and six had not).
- Hypnotic experience: all participants had prior hypnotic experience (four participants were lowly sensitive to hypnosis and nine participants were highly

sensitive to hypnosis).

**B. Pathological conditions**

- Acute pain: all 31 participants experienced an acute sore throat.
- Chronic pain: not applicable
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**Experiment preparation**

**A. A pain scale:** The Wong–Baker FACES pain rating scale was employed. Pain variables were used to measure pain.

**B. A consent form** was provided.

**C. A physiological scale:** Systolic and diastolic blood pressure, heart rate, and respiration were measured (the data were not included in this study).

**D. An MP3 DVD** for bedtime self-hypnosis was provided to the experimental group with low hypnotic sensitivity.

**Clinical experiment procedures**

**Step 1:** We recruited participants over the telephone according to their physiological and pathological conditions.

**Step 2:** The participants signed a consent form during their first clinical visit. The participants were required to complete a pain scale, and their hypnotic sensitivity was assessed and physiological data were collected. Subsequently, the participants were assigned to the control or experimental group. During the first hypnotic acupuncture treatment, an MP3 file was played back to the participants. At the end of the treatment, an MP3 DVD for bedtime hypnosis was provided to the participants with low hypnotic sensitivity.

**Step 3:** Three days after the first treatment, the participants were required to complete the pain scale and their physiological data were collected. Subsequently, they received the second hypnotic acupuncture treatment.

**Step 4:** Three days after the second treatment, the participants were required to complete the pain scale and their physiological data were collected. Subsequently, they received a follow-up treatment.

**Results**

In this study, we visited the participants at home and interviewed them to avoid inconveniencing them with transportation concerns. Originally, 31 participants were recruited in this study. Among the 31 participants, 2 participants withdrew and sought hypnotic treatment for their increasingly severe pain. Therefore, 13 men and 16 women (29 participants in total) completed the experiment. To understand how various pain-related variables influenced hypnoacupuncture analgesia, we used TCM acupuncture, hypnosis, a combination of TCM

acupuncture and hypnosis, and a control treatment as the independent variables and pain intensity, pain duration, pain frequency, pain sensation, and pain area as the dependent variables. A one-way multivariate analysis of variance (ANOVA) was performed. The results are described as follows.

**Initial values**

As shown in Table 1, significant differences in pain intensity, pain duration, pain frequency, and pain sensation existed between the control and experimental groups. According to the ANOVA analysis, patients with substantial pain-related variables chose the combination treatment method; patients with strong pain intensity and pain sensation tended to choose the TCM acupuncture treatment; and patients simply with a strong pain sensation often chose the hypnotic treatment.

**Numerical analysis for the first treatment**

As shown in Table 2, significant differences in pain duration, pain sensation, and pain area existed between the control and experimental groups. According to the ANOVA analysis, the TCM acupuncture treatment and the combination treatment significantly relieved the participants’ pain compared with the other treatment methods. In addition, all four treatment methods did not significantly reduce pain intensity and frequency; regarding pain duration reduction, the combination treatment was superior to TCM acupuncture, the hypnotic treatment, and the control treatment. For reducing pain sensation, the combination treatment and hypnotic treatment were superior to TCM acupuncture and the control treatment; concerning reducing pain area, TCM acupuncture, the hypnotic treatment, and the combination treatment were superior to the control treatment.

**Numerical analysis for the second treatment**

As shown in Table 3, significant differences in pain intensity, pain duration, pain frequency, pain sensation, and pain area existed between the experimental and control groups. According to the ANOVA analysis, the TCM acupuncture and control groups had a significantly stronger pain sensation than the other groups did. The control group had a significantly higher pain frequency than the other groups did. In addition, regarding whether various types of treatment relieved the participants’ pain, the pain intensity, pain duration, pain frequency, pain sensation, and pain area of the participants in the combination group decreased. Of the reduction of pain intensity, the combination and hypnosis groups were superior to the TCM acupuncture and control groups. For the reduction of pain duration and pain frequency, the

**Table 1.** ANOVA analysis of the initial values of the pain-related variables for the different treatment methods.

Independent variable \ Dependent variable	1. TCM acupuncture		2. Hypnosis		3. Combination method		4. Control method		F	LSD
	M	SD	M	SD	M	SD	M	SD		
Pain intensity	7.75	1.04	7.14	0.9	8.13	0.83	6.67	0.82	3.52*	3.1>2.4
Pain duration	6.25	1.04	5.86	0.9	8.13	0.83	5.33	0.82	13.24***	3>1.2.4
Pain frequency	6.31	0.96	5.71	1.11	7.38	0.74	5.17	1.17	6.50*	3>1.2>4
Pain sensation	7.75	1.04	7.86	0.9	7.75	0.71	6.5	0.55	3.79*	2.1.3.>4
Pain area	2.25	1.04	2.14	0.69	1.75	0.71	1.33	0.52	1.92	n.s.

**Table 2.** ANOVA analysis of the differences between the initial values and those from the first treatment for the different treatment methods.

Independent variable \ Dependent variable	1. TCM acupuncture		2. Hypnosis		3. Combination method		4. Control method		F	LSD
	M	SD	M	SD	M	SD	M	SD		
Pain intensity	-0.63	0.52	-0.57	0.79	-1.25	0.46	-0.17	1.47	1.99	n.s.
Pain duration	0	0.93	-0.71	0.76	-1.13	0.83	0	0.63	3.55*	3<1.4
Pain frequency	-1.56	1.24	-0.57	0.53	-1.5	0.53	-0.67	1.51	1.96	n.s.
Pain sensation	-0.88	0.83	-1.57	0.98	-1.88	0.64	0.17	1.17	6.73**	3.2<1.4
Pain area	-0.38	0.74	-0.86	0.69	-0.5	0.53	0.5	0.55	5.15**	2.3.1<4

**Table 3.** ANOVA analysis of the differences between the initial values and those from the second treatment for the different treatment methods.

Independent variable \ Dependent variable	1. TCM acupuncture		2. Hypnosis		3. Combination method		4. Control method		F	LSD
	M	SD	M	SD	M	SD	M	SD		
Pain intensity	-1.63	0.52	-2.14	1.21	-2.88	0.99	-0.67	1.86	4.23*	3.2<1.4
Pain duration	-2.25	1.39	-2.86	1.35	-4.25	1.49	-1.5	0.84	5.65**	3<2.1.4
Pain frequency	-3.94	0.94	-3.29	0.95	-5.25	0.71	-1.83	1.17	15.84***	3<1.2.4
Pain sensation	-3.5	1.07	-5	1.63	-4.63	0.52	-1.33	1.63	11.18***	2.3.1<4
Pain area	-0.75	1.28	-1	0.82	-0.63	0.74	0.5	0.55	3.34*	2.3.1<4

combination group was superior to the TCM acupuncture, hypnosis, and control groups. Regarding the reduction of pain sensation and pain area, the TCM acupuncture, hypnosis, and combination groups were superior to the control group.

**Numerical analysis for the follow-up treatment**

As shown in Table 4, significant differences in pain intensity, pain duration, pain frequency, pain sensation, and pain area existed between the experimental and control groups. According to the ANOVA analysis, the TCM acupuncture and control groups had a significantly stronger pain sensation than the other groups did and the control group had a significantly higher pain frequency than the other groups did. Regarding the reduction of pain intensity, the combination and hypnosis groups were superior to the TCM acupuncture and control groups. For the reduction of pain duration, pain frequency, pain sensation, and pain area, the hypnosis and combination groups were superior to the control group.

The experiment results showed that regarding the reduction of pain intensity, the combination and hypnosis groups were superior to the TCM acupuncture and control groups. For the reduction of pain duration, pain frequency, pain sensation, and pain area, the TCM acupuncture, hypnosis, and combination groups were superior to the control group.

**Contributions of the pain-related variables**

In accordance with the ANOVA analyses, the

contributions of the pain-related variables are presented in Table 5.

**Discussion**

To verify whether there exists hypnoacupuncture analgesia effects for pain relief, we conducted a six-month clinical experiment in this study. The results showed that a combination of acupuncture and hypnosis enhanced the analgesic effect and reduced the pain intensity of the participants at various treatment stages. Particularly, the pain intensity of the hypnosis and combination groups significantly decreased; furthermore, the pain sensation of the TCM acupuncture group significantly decreased, alleviating their pain intensity.

Insight to the underlying mechanisms of neuro-analgesia, Hegu acupuncture point analgesia, and hypnotic analgesia, as well as theories about how to integrate medical hypnosis and Hegu acupuncture points to relieve pain have been reported in several studies (6-11). In a review article, we summarized five mechanisms for integrating the Hegu acupuncture point analgesia and the hypnotic analgesia: 1) the Sensory Cortex (SI and SII areas) responsible for pain sensation (12-14); 2) the Anterior Cingulate Cortex (ACC), which is responsible for pain-related emotion(12-13,15-16); 3) the Insular Cortex (IC), which is responsible for visceral perception, motion perception, emotional responses, and memory function (15,17-18); 4) the Prefrontal Cortex, which is responsible for pain perception and assessment (18,20);

**Table 4.** ANOVA analysis of the values from the follow-up treatment for the different treatment methods.

Independent variable \ Dependent variable	1. TCM acupuncture		2. Hypnosis		3. Combination method		4. Control method		F	LSD
	M	SD	M	SD	M	SD	M	SD		
Pain intensity	4.25	0.89	2.43	0.98	2.25	0.71	3.83	0.75	10.73***	4.1>2.3
Pain duration	2.13	0.64	1.57	0.53	1.38	0.52	3.17	0.75	11.38***	4>1.2.3
Pain frequency	1.25	0.46	1.14	0.38	1.13	0.35	3.67	1.03	28.84***	4>1.2.3
Pain sensation	1.5	0.53	1.29	0.49	1.25	0.46	4.33	1.37	24.95***	4>1.2.3
Pain area	1.13	0.35	1.14	0.38	1	0	2	0.63	9.07***	4>2.1.3

**Table 5.** Contributions of the pain-related variables.

Group	Contribution
TCM acupuncture group	<ul style="list-style-type: none"> <li>– Contributions to pain intensity, pain duration, and pain sensation: initial value and the first treatment &gt; the second treatment &gt; the follow-up treatment</li> <li>– Contributions to pain frequency: initial value &gt; the first treatment &gt; the second treatment &gt; the follow-up treatment</li> </ul>
Hypnosis group	<ul style="list-style-type: none"> <li>– Contributions to pain intensity, pain duration, and pain frequency: initial value and the first treatment &gt; the second treatment &gt; the follow-up treatment</li> <li>– Contributions to pain sensation: initial value &gt; the first treatment &gt; the second treatment and the follow-up treatment</li> </ul>
Combination group	Contributions to pain intensity, pain duration, pain sensation, and pain frequency: initial value > the first treatment > the second treatment > the follow-up treatment
Control group	<ul style="list-style-type: none"> <li>– Contributions to pain intensity: the follow-up treatment &gt; initial value</li> <li>– Contributions to pain duration and pain sensation: initial value and the first treatment &gt; the second treatment and the follow-up treatment.</li> <li>– No significant differences in pain frequency existed</li> </ul>

and 5) the serotonin (5-HT) neurotransmitter system, which influences pain relief. These five mechanisms can influence five pain-related variables (i.e., pain intensity, pain duration, pain frequency, pain sensation, and pain area), which served as the dependent variables for the present clinical experiment (13-14,21-22).

We suggest that future studies should consider clinical hypnoacupuncture to incorporate other variables such as experimental duration, environmental design, pain and analgesic criteria, participant perception, pain type and level, pain assessment standards, physiological time for treatment, local or systemic analgesia, determination of brain areas involved in the sensation of pain and its corresponding analgesia, etc. Finally, the results of this study can serve as an evidence for TCM acupuncture treatment for pain relief and can help promote the concept of holistic therapy in TCM with medical hypnosis, i.e., the integration of body and mind.

### Acknowledgements

We would like to thank our partner Dr. Chen for sharing related information and discussing the topic covered in this study with us.

### Conflict of interest

The authors declare that there are no conflicts of interest.

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