

Original Article

Clinical observation on acupuncture combined with massage therapy in simple obesity

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Abstract: Objective: To explore the clinical effect of acupuncture combined with massage therapy in patients with simple obesity. Methods: In total, 113 simple obesity patients admitted to our hospital were enrolled for retrospectively analysis of clinical data and divided into two groups according to the therapies. The 56 patients in group A were treated with acupuncture only, while the 57 in group B were treated with massage in addition to acupuncture; so as to determine the overall response rate, body weight, body mass index (BMI), body circumference, blood lipid changes, severity of illness, and quality of life. Results: The overall response rate (ORR) in group B was 92.98%, which was higher than 73.21% in group A ($P < 0.05$). The body weight and BMI, hip circumference and waist circumference, as well as TG and TC levels of patients in group B after treatment were smaller than those of patients in group A ($P < 0.05$ for all). The proportion of cases in normal condition and cases with grade I obesity was larger in group B compared with group A; besides, the constituents of cases with grade II and III in group B were smaller than that in group A ($P < 0.05$). After treatment, patients in group B showed superior scores in evaluation of social function, physical function, role function, cognitive function and emotional function, as compared with patients in group A ($P < 0.05$). Conclusion: Acupuncture combined with massage therapy in the treatment of obesity can reduce the body weight, BMI, hip circumference and waist circumference, and improve blood lipids as well as quality of life to a certain extent.

Keywords: Acupuncture, massage, simple obesity, combination therapy, body circumference, blood lipids, severity of illness

Introduction

Simple obesity refers to obesity without obvious metabolic or endocrine disease [1]. Studies have shown that simple obesity is closely related to various major diseases such as infertility, stroke, coronary heart disease, hypertension, dyslipidemia, and type 2 diabetes [2, 3]. Obesity and diseases caused by it affect a patients' physical and mental health, while reducing the quality of life; and it has developed into a major health problem worldwide [4].

Although the specific pathogenesis of simple obesity has not been clarified, it is usually considered that simple obesity could be the result of several factors including gene-environment interaction, increased intake of high-energy food, and genetic susceptibility [5, 6]. A large number of international studies have been made in the treatment of this disease, includ-

ing drug therapies, and non-drug treatments [7] such as changing living habits, more physical exercise, and healthier diet that offer effects in a short period of time if the risk of relapse is avoided. Apart from these, surgeries such as gastric bypass, laparoscopic adjustable gastric banding, and intragastric balloon are often applied for patients who are obese. Surgeries however are prone to cause a variety of surgical complications [8, 9]. On the other hand, drug therapies (Sibutramine, Fenfluramine and other drugs) are effective in the treatment of simple obesity. They can bring about side effects and even death in the long-term [10]. Safe and effective ways that are preferable for treatment in the clinic are required.

In recent years, there have been increasing clinical studies on the treatment of simple obesity with traditional Chinese medicine (TCM). External and/or internal therapy of TCM pro-

vides new strategies for the treatment of obesity [11-13]. Acupuncture is relatively easy to perform, economic, and less side effects, etc. in improving conditions in the human body. Massage is a natural way of healing that avoids the pain of acupuncture and drugs, and it will not produce toxic side effects. In this study, acupuncture combined with massage therapy was used in the treatment of simple obesity and explored the desired effects of weight loss.

Material and methods

Material

A total of 113 simple obesity patients admitted to our hospital were enrolled for a retrospective analysis of clinical data and divided into two groups according to the therapies. The 56 patients in group A were treated with acupuncture only, while the 57 in group B were treated with massage in addition to acupuncture. (1) Inclusion criteria: patients who signed the informed consent; met the diagnostic criteria of simple obesity in *Practical Internal Medicine* [14]; aged between 18 and 60 years; did not receive any treatment for weight loss within 2 months before enrollment; normal mental status; and were approved by the Ethics Committee of Changchun University of Chinese Medicine, were enrolled. (2) Exclusion criteria: patients who are breast feeding or pregnant; or combined with primary or secondary diseases of tumors, hematopoietic system issues, cardiovascular system disease; or with metabolic disorders, endocrine and other diseases; or has Parkinson's disease, Alzheimer's disease and other mental system diseases; or who quit midway, were excluded.

Methods

Treatment in Group A (acupuncture alone): Acupoints were selected in strict accordance with the principle of "resolving phlegm and stagnation, and strengthening the spleen and stomach". With pins centered on the umbilicus, 4 (left, right, upper, and lower) acupoints 4 inches and 4 acupoints 2 inches beside the umbilicus were confirmed, including Tianshu, Shimen, Xiawan, Daheng, Zhongji, and Zhongwan. Another 4 acupoints 3 inches from the umbilicus were selected at 45° to the lower right, upper right, lower left, and upper left. Apart from the 12 acupoints, Yinlingquan (uni-

lateral), Zusanli (unilateral), and Meridian Liangqiu (bilateral) were needed. Following routine disinfection of the acupoints, the therapeutic needles (Huatuo No. 30 1.5-inch filiform needle of stainless steel) attached to a fixed base and plastic cannula were inserted into the subcutaneous tissue until it brought about the desired sensation before twisting stimulation at 360° using the neutral supplementation and draining method. The needle was retained for 30 min. When removed, the therapeutic needle was first pulled out and then the fixed base and plastic cannula, followed by disinfection and compression. Acupuncture was performed every other day for 12 days (a course of treatment) for each patient.

Treatment in Group B (acupuncture + massage): The acupuncture method was the same as in Group A. At the same time, patients in Group B were treated with massage based on the principle of "balancing yin and yang and regulating viscera", for a total of 24 treatments, once every other day, each for 40-50 min, were given to Group B. The massage techniques included scrubbing, massage, pushing, kneading, and point-pressing, etc. Different parts were subject to different massage techniques: (1) Thorax and abdomen: the abdomen was massaged for 2 min in the clockwise direction, 60-80 circles/min. Starting from the processus xiphoideus and the lower edge of rib, the horizontal line of the abdominal stomach meridian, Ren meridian to Guanyuan point was rubbed with the thumb facing downward for 1.5 min, and then the thumb was kneading Guanyuan point, Qihai point, Tianshu point, and Zhongwan point, 0.5 min for each point, until the arrival of qi. Shenque point was palmely vibrated for another 1 min. From the point of belt vessel a forceful massage went along the course of belt vessel through the ventral midline 5 times. Starting from the left lateral area, the abdomen was rubbed with both hands, and pushed forcefully with the hand towards the right outboard side, and was repeated 5 times. Centered on the Shenque point, the abdomen was pushed in a clockwise direction with the palm starting from the right lower abdomen to the right upper, left upper, and left lower quadrant, and finally above the pubic symphysis for 1.5 min for a total of 15 operations. Additionally, attention was paid to the control of force during the massage so that the subcutaneous

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tissues were put into motion and the patient felt tightness in the waist and abdomen. (2) Limbs: The thumb was kneading the limbs, 0.5 min each time. Point massage was for Quchi, Sanyinjiao, Xuehai, Fenglong, Zusanli, and Hegu, 0.5 min for each time within 6 min until feeling sore and swollen. (3) Dorsolumbar region: The patient was in the prone position. Skin meridians on both sides of the back were pressed back and forth 5-10 times for about 1 min so as to relax the local soft tissues. Pishu bilateral points were rubbed with the thumb, 3 min for each acupoint for a total of 6 min. Shenshu and Ganshu were rubbed for 0.5 min, each, until a feeling of soreness. The left back and the governor meridian were rubbed directly for 0.5 min each before evidence of diathermanous within 1 min.

Outcome measures

(1) Therapeutic effects [15]: After treatment, designated as cured if the clinical symptoms disappeared or almost disappeared, standard body weight was seen with BMI < 25 kg/m²; or is excellent if most symptoms disappeared, weight loss > 5 kg and BMI loss > 4 kg/m²; or is effective if significant improvement in clinical symptoms was seen plus weight loss 3-5 kg and BMI loss 2-4 kg/m²; or is ineffective if the clinical symptoms did not change at all whilst weight loss < 3 kg and /or BMI loss < 2 kg/m². ORR = cured + excellent + effective. (2) Body weight and BMI [16]: Before and after treatment, patients in both groups were measured for fasting body weight in underwear only, without shoes. Body weight was read in kg. BMI = body weight (kg)/[height (m)]². (3) Body circumference [17]: Before and after treatment, the hip circumference and waist circumference of the two groups were measured using a tape: in the early morning, the fasting patient was in an upright position and exhaled. With breath holding, their hip circumference (the highest point of the buttock) and waist circumference (Umbilical cord level) were measured. (4) Blood lipids: Before and after treatment, 3 ml of fasting cubital venous blood was collected in both groups in the morning and centrifuged at 3000 r/min for 10 min before the determination of triglycerides (TG) and total cholesterol (TC) using an automatic biochemical analyzer. (5) Severity of illness: Evaluation for obesity (normal; grade I, II, and III) was made after treatment. (6) Quality of life [18]: Quality of life of the two groups of patients was evaluated before and after treatment by QLQ (Quality of Life Ques-

tionnaire) covering social function, physical function, role function, cognitive function and emotional function, all of which were scored by a centesimal system. The quality of life was directly proportional to the score.

Statistics

SPSS 22.0 was used for data analysis. Measurement data were expressed as mean ± standard deviation. Data following normal distribution were subject to t test; otherwise, Mann-Whitney U test was applied. Enumeration data were expressed in [n (%)]. Comparison among groups was using chi-squared test. P < 0.05 indicated statistical significance.

Results

General data of the two groups of patients

There were 33 males and 23 females in group A, and 35 males and 22 females in group B. The age of patients in group A was 22-48 years, average (36.52±2.18); similar to that in group B, 23-50 years, average (36.59±2.12). The course of disease in group A was 1-7 years ((5.89±0.56) in average), while in group A 2-8 years ((5.92±0.51) in average). There were 10, 18, 13 and 15 patients sharing an education level respectively of primary school, junior high school, secondary school and college or above in group A. The number in group B was 8, 20, 15 and 14 cases, respectively. Little difference was found between the two groups in general data including gender, age, and course of disease or education (P > 0.05) (**Table 1**).

ORR in the two groups of patients

The number of patients cured, or showing excellent, effective, and ineffective outcomes, respectively, in group A was 18, 12, 11, and 15, with an overall response rate of 73.21%. The same in group B was 25, 15, 13, and 4 respectively (ORR = 92.98%, higher than that in group A) (P < 0.05) (**Table 2**).

Changes in body weight and BMI of the two groups of patients

Before treatment, the body weight of patients in group A was (75.63±5.85) kg similar to that (75.69±5.82) kg in group B (P > 0.05). After treatment, the body weight in group B was (65.25±4.52) kg, lower than that of group A (71.25±5.28) kg (P < 0.05). BMI of group A was (29.02±3.25) kg/m² and (29.09±3.21) kg/m²

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Table 1. General data of patients in both groups [n (%)]/($\bar{x} \pm s$)

Item		A (n = 56)	B (n = 57)	t/ χ^2	P
Sex (case)	M	33 (58.93)	35 (61.40)	0.072	0.788
	F	23 (41.07)	22 (38.59)		
Age (yr)		36.52±2.18	36.59±2.12	0.173	0.863
Course of disease (yr)		5.89±0.56	5.92±0.51	0.298	0.766
Education (case)					
	Primary school	10 (17.86)	8 (14.04)	0.025	0.963
	Junior high school	18 (32.14)	20 (35.09)		
	Technical secondary school/high school	13 (23.21)	15 (26.32)		
	Junior college or above	15 (26.79)	14 (24.56)		

Table 2. ORR in both groups [n (%)]

Group	Case	Cured	Excellent	Effective	Ineffective	ORR
A	56	18 (32.14)	12 (21.43)	11 (19.64)	15 (26.79)	41 (73.21)
B	57	25 (40.35)	15 (26.32)	13 (22.81)	4 (7.01)	53 (92.98)*
χ^2						7.892
P						0.005

Note: *indicates $P < 0.05$ compared with group A.

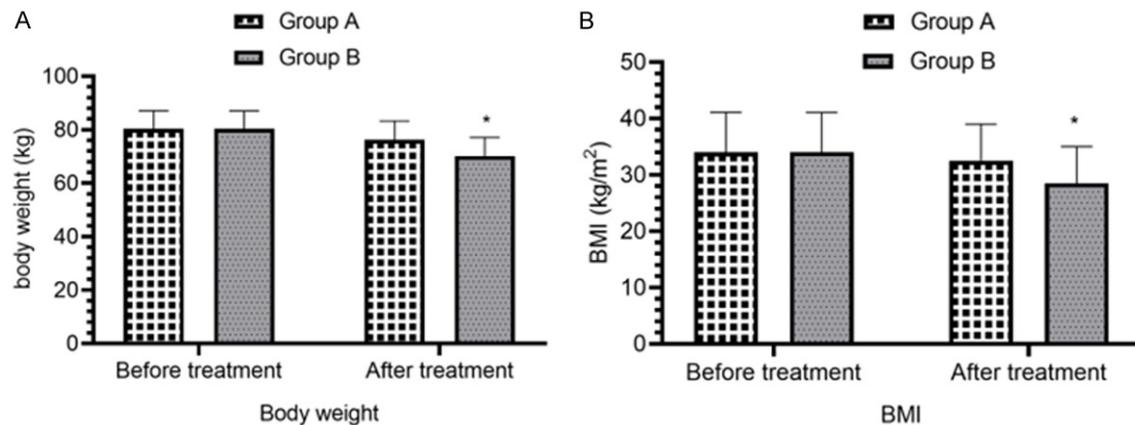


Figure 1. Body weight and BMI of the two groups of patients. Body weight and BMI before treatment in group A were not notably different from that in group B, $P > 0.05$. After treatment, body weight and BMI of patients in group B were smaller than those in group A, $P < 0.05$. * indicates $P < 0.05$ compared with group A.

of group B before treatment ($P > 0.05$). BMI of group B after treatment was (23.89 ± 2.12) kg/m² which was smaller than that of group A (27.89 ± 2.28) kg/m² ($P < 0.05$) (Figure 1).

Changes in body circumference of the two groups of patients

There was no significant difference in hip circumference and waist circumference between groups A and B before treatment ($P > 0.05$). Compared with those before treatment, hip circumference and waist circumference were re-

duced in both groups after treatment ($P < 0.05$) and were less in group B ($P < 0.05$) (Table 3; Figure 2).

Changes in blood lipids of the two groups of patients

No significant difference was reported in TG and TC before treatment between groups A and B ($P > 0.05$). TG and TC decreased in both groups after treatment ($P < 0.05$) and were smaller in group B compared with those in group A ($P < 0.05$) (Table 4).

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Table 3. Body circumferences of patients in both groups ($\bar{x} \pm s$, cm)

Group	Hip circumference		Waist circumference	
	Before treatment	After treatment	Before treatment	After treatment
A (n = 56)	105.69±8.52	100.25±7.56 [#]	94.52±3.26	91.25±2.15 [#]
B (n = 57)	105.72±8.49	92.12±6.12 ^{#,*}	94.58±3.22	81.12±1.18 ^{#,*}
t	1.269	6.288	0.098	18.832
P	0.207	0.000	0.922	0.000

Note: [#]indicates P < 0.05 compared with that before treatment. ^{*}indicates P < 0.05 compared with group A.

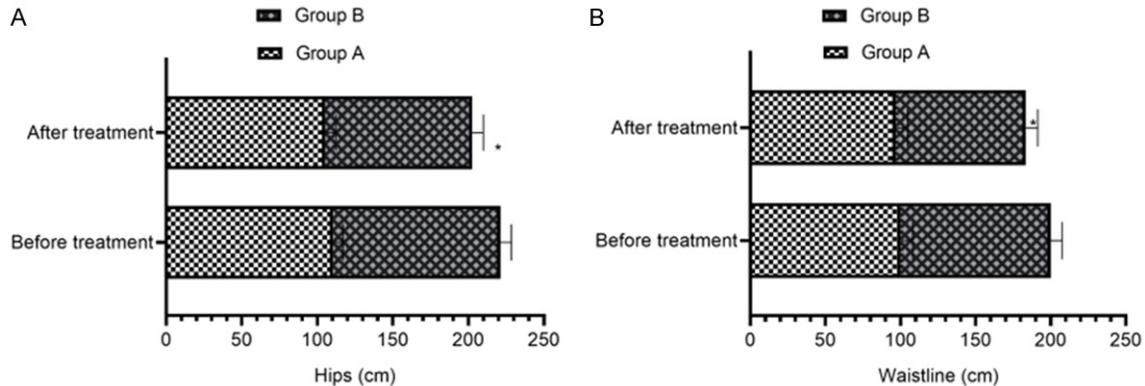


Figure 2. Body circumferences between the two groups. Hip and waist circumference before treatment in group A were not notably different from that in group B, P > 0.05. Both circumferences in group B were smaller than those in group A after treatment, P < 0.05. * indicates P < 0.05 compared with group A.

Table 4. Blood lipids in the two groups of patients ($\bar{x} \pm s$, mmol/L)

Group	TG		TC	
	Before treatment	After treatment	Before treatment	After treatment
A (n = 56)	2.18±0.25	2.09±0.12 [#]	6.18±0.85	5.11±0.78 [#]
B (n = 57)	2.20±0.23	1.62±0.11 ^{#,*}	6.20±0.83	4.22±0.22 ^{#,*}
t	0.442	21.709	0.127	8.286
P	0.659	0.000	0.899	0.000

Note: [#]indicates P < 0.05 compared with that before treatment. ^{*}indicates P < 0.05 compared with group A.

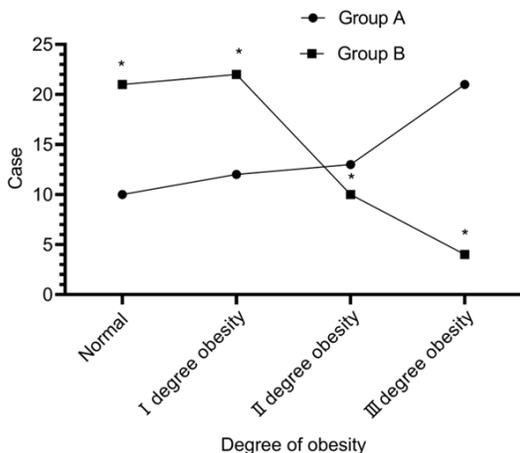


Figure 3. Severity of illness as compared between the two groups. The constituent ratio of normal and grade I obese patients after treatment in group B was higher than that in group A, while the constituent ratio of grade II & III obese patients was lower than that in group A, P < 0.05. * indicates P < 0.05 compared with group A.

Severity of the disease between the two groups

The number of patients classified as normal, grade I, grade II and grade III after treatment in group A was 10, 12, 13, and 21 patients (17.86%, 21.43%, 23.21%, and 37.50% respec-

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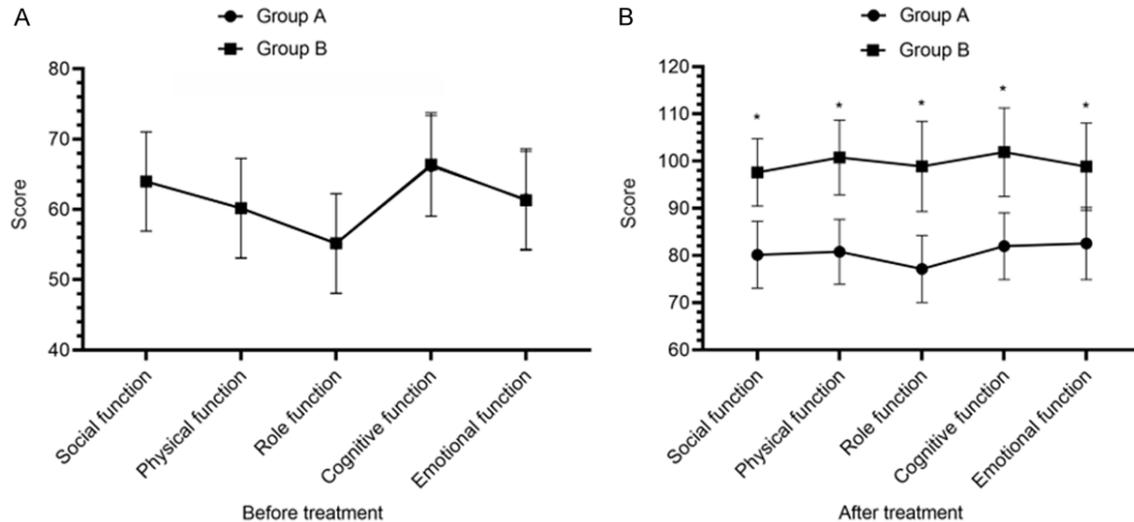


Figure 4. Quality of life scores as compared between the two groups. The scores of social function, physical function, role function, cognitive function and emotional function before treatment in group A were not remarkably different from those in group B, $P > 0.05$. After treatment, these scores were higher in group B as compared with group A, $P < 0.05$. * indicates $P < 0.05$ compared with group A.

tively); while group B was 21, 22, 10, and 4 (36.84%, 38.60%, 17.54%, and 7.02% respectively). Unlike those with grade II or III, there were more normal and grade I cases in group B ($P < 0.05$) (Figure 3).

Quality of life scores between the two groups

Before treatment, scores of social function, physical function, role function, cognitive function and emotional function in group A were (58.96±3.26), (55.12±2.39), (50.12±3.27), (61.12±2.32), and (56.32±3.18), respectively. In group B they were (58.99±3.21), (55.19±2.32), (50.19±3.21), (61.19±2.31), and (56.39±3.12) respectively. The differences were not significant ($P > 0.05$). After treatment, the scores in the same order were (92.56±2.36), (95.16±3.27), (92.13±2.18), (95.27±2.22), and (92.28±2.88) in group B, all of which higher than those in group A: (75.16±3.69), (75.96±3.27), (72.12±2.28), (76.98±3.28), and (77.15±3.19) ($P < 0.05$) (Figure 4).

Discussion

The improvement in living standards in China has increased the number of patients with obesity, a chronic metabolic disease [19] that affects patients' daily life as well as serves as a risk factor for hyperlipidemia, diabetes, coronary heart disease, and hypertension, etc. [20,

21]. One of the common types of obesity, simple obesity, is defined as excessive body weight caused by excessive caloric intake, reduced consumption, and abnormal or excessive fat distribution in the body, without obvious endocrine or metabolic diseases.

In traditional Chinese medicine, obesity is closely related to mental emotions, rest and less labor, long lying being sedentary, and overeating fat and sweet and tasty food [22]. Obese people suffer from phlegm-dampness, dysfunction of viscera, spleen and stomach, turbidity accumulation, and fat from food. These are the key to the disease. In this study, in order to further improve the therapeutic effect of obesity, traditional Chinese acupuncture combined with massage was adopted, and the results showed that the therapeutic effect of Group B was better than that of Group A. The mechanism of action should be attributed to that acupuncture, a traditional Chinese medicine therapy with high application rate, is able to strengthen the body resistance to eliminate pathogenic factors, regulate yin and yang, adjust the function of viscera, and dredge meridians, guided by the ideas of "address both symptoms and root causes" and "search for the primary cause of disease in treatment" and the therapeutic principles of "clearing away heat and warming cold" and "tonifying deficiency and purging excess" [23, 24]. The 12 abdominal points centered on the umbilicus as well as Yinling-

quan (unilateral), Zusanli (unilateral) and meridian points Liangqiu (bilateral) were selected. Acupuncture at Zusanli, Daheng, Xiawan and Zhongwan strengthens function of the spleen and stomach. Zhongwan regulates the spleen and stomach by acting on the rise and fall, the middle burner, dissipating dampness, and gastric qi. Modern studies have shown that acupuncture at Zhongwan point effectively promotes gastrointestinal peristalsis, acupuncture at Xiawan dredges water-dampness and keeps a healthy spleen and stomach, and acupuncture at Daheng regulates the intestines, warms the middle burner, and invigorates the spleen [25].

Zhongji, Shimen, Zusanli and Yinlingquan serves to remove dampness and eliminate phlegm. Yinlingquan eliminates phlegm, dampness stagnation, motivates the middle burner. Zusanli eliminates distension and fullness, regulating qi, tonifying qi, and regulating the spleen and stomach. Studies have shown that acupuncture at Zusanli point effectively regulates multiple systems. Acupuncture at Shimen eliminates phlegm and disperses stasis, invigorates spleen and removes dampness [26]. The compatibility of Liangqiu and Tianshu reduces phlegm and stagnation. Tianshu is the front-mu point relating to the large intestine by means of regulating qi and defecating, producing diarrhea and relieving pain, dissipating dampness, promoting blood circulation and removing blood stasis, eliminating food and guiding stagnation, regulating qi, and regulating stomach and intestines. Local peripheral acupuncture also plays roles in eliminating food and guiding stagnation, or unobstructing qi. Acupuncture at various points is effective in resolving phlegm and eliminating stagnation, and strengthening the spleen and stomach. Besides, massage therapy promotes lipolysis, blood supply to the skin, estrogen secretion, tissue elasticity, accelerates the clearance of metabolites, and then achieves the outcome of weight loss [27]. The results of this study also showed that after treatment, the body weight, BMI, hip and waist circumference, and TG and TC, of patients in group B were less than those of group A; and quality of life scores in group B were superior compared with group A. These further demonstrated the effectiveness of acupuncture combined with massage in the treatment of simple obesity. Acupuncture therapies enhance sympathetic function and inhibit parasympathetic nerves. They regu-

late the metabolism of the body. Acupoints, meridians and techniques interact to regulate the function of viscera in the body such as motivating the spleen and stomach, releasing excessive lung qi and excreting water dampness. These actions on the conduction of the large intestine and body fluid metabolism lead to weight loss [28]. In addition, massage by neurohumoral regulation effectively regulates endocrine disorders, enhances the resting metabolic rate, promotes the activation of adipocytes, promotes the loss of appetite in patients, increases energy consumption, and improves water-electrolyte metabolism. Acupuncture combined with massage therapy can achieve complementary advantages, synergistic promotion, and further improve the effect of weight loss [29].

In summary, acupuncture combined with massage in the treatment of simple obesity can reduce body weight and BMI, hip and waist circumference, improve blood lipids and quality of life to a certain extent.

The small sample size, may determine a bias in these results. More studies with larger samples, longer period of study and more comprehensiveness are warranted.

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Disclosure of conflict of interest

None.

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