Clinical research on using acupuncture to treat female adult abdominal obesity with spleen deficiency and exuberant dampness

Jie Wu, Qing Li, Lin Chen, Dehua Tian

OBJECTIVE: To observe the curative effect of acupuncture at hour-prescriptive points, a method of midnight-noon ebb-flow, to treat female adult abdominal obesity with spleen deficiency and exuberant dampness.

METHODS: Seventy-two patients with adult abdominal obesity with spleen deficiency and exuberant dampness were randomly divided into a treatment group and a control group with 36 patients in each group. Patients in the treatment group were treated with acupuncture at hour-prescriptive points from 9 to 11 AM every day on the principle of taking points along channels in time. Patients in the control group were treated with acupuncture at any time beyond 9 to 11 AM. Patients in both groups were treated for three courses of treatment.

RESULTS: The total effective rate was 87.5% in the treatment group and 78.8% in the control group. The total curative effect in the treatment group was significantly better than that in the control group in reducing body weight, body mass index, waistline, obesity level, and clinical symptoms (P<0.05). After treatment, t-test was used on two independent samples to analyze the ratio of waistline to hipline and hipline. A value of 0.01<P<0.05 expressed a weaker outcome and similar curative effect between the two groups in reducing ratio of waistline to hipline and hipline of patients. This value indicates that the treatment group has no obvious superiority to that of the control group for curative effect.

CONCLUSION: Because it was superior in reducing waistline and body weight of female adult patients suffering from abdominal obesity with spleen deficiency and exuberant dampness, acupuncture at hour-prescriptive points, a method of midnight-noon ebb-flow, is an effective method to treat obesity.

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Key words: Obesity, abdominal; Dampness stagnancy due to spleen deficiency; Acupuncture; midnight-noon ebb-flow

INTRODUCTION

Abdominal obesity, also called central or centripetal obesity, refers to obesity caused by the deposition of excessive fat in the abdomen or in the internal organs in the abdominal cavity. Research has shown that patients with abdominal obesity have a much higher risk of suf-
ferring from hypertension, diabetes, hyperlipemia, arteriosclerosis, cardiocerebrovascular disease, and cancer. World Health Organization (WHO) has listed obesity as one the top ten most dangerous factors for causing diseases, emphasizing the urgency of relevant research. Acupuncture used to treat obesity is safe, effective, and non-toxic. In a study on using acupuncture to treat obesity, Xu found that acupuncture can strengthen the function of sympathetic nerves, inhibit overactive parasympathetic nerves, regulate the function of vegetative nerves, and effectively enhance the basal metabolic rate and the level of endocrine hormones. These changes can increase the consumption of energy and promote lipodermis.

Under the prerequisite of accurately differentiating syndromes, acupuncture at hour-prescriptive points (a method of midnight-noon ebb-flow) can guarantee accurate and effective transmission of information on acupuncture to the disease site. The accurate transmission can maximize adjustment effect. Acupuncture at hour-prescriptive points is a traditional classic Traditional Chinese Medicine (TCM) therapy, but is rarely used in clinical practice. It is even more rarely seen in studies on the treatment of female adult abdominal obesity with spleen deficiency and exuberant dampness. We have long used acupuncture clinically at hour-prescriptive points along channels in time to treat female adult abdominal obesity with spleen deficiency and exuberant dampness. According to the time of the Twelve Earthly Branches and in combination with the circulation of Qi and blood in the Twelve Channels, female adult abdominal obesity with spleen deficiency and exuberant dampness was treated with acupuncture at points in the spleen channel from 9 to 11 AM, when Qi and blood in the spleen channel are most exuberant.

MATERIALS AND METHODS

Seventy-two female adult obese outpatients conforming to diagnostic and inclusive standards were selected at the Center for Preventive Treatment of Diseases in the Hospital Affiliated to Chengdu University of Traditional Chinese Medicine from February to December 2011. This experiment was approved by the ethics committee Hospital Affiliated to Chengdu University of Traditional Chinese Medicine. All participants signed an informed consent agreement and voluntarily took part in this study.

The 72 patients were randomly divided with SPSS 16.0 software (Chicago, IL, USA) into a treatment group (n=36) and a control group (n=36) according to random number table. The patients in the treatment group were 19-38 years old, (28±6) years on average, with an illness course of 1-15 years, (3±1) years on average. The patients in the control group were 20-36 years old, (28±9) years on average, with an illness course of 2-15 years, (3±2) years on average. There were no statistical difference (P>0.05) in general data, obesity-related indexes, or total score for symptoms between the two groups.

Diagnostic standards

Western medical diagnostic standards were used in reference to the standard for diagnosing Asian adult obesity published by WHO in 2000 and the standard for diagnosing Chinese abdominal obesity in the standard for diagnosing metabolic syndrome from the International Diabetes Union in 2005. Criteria for diagnosis were: (a) body mass index (BMI) ≥25 [BMI=body weight (kg)/body height (m²)]; and (b) male waistline ≥90 cm and female waistline ≥80 cm.

For TCM differentiation of syndromes, the diagnosis of pure obesity and standard for evaluating curative effect was used. Pure obesity is divided into TCM syndrome types, and the key points for differentiating syndromes of spleen deficiency and exuberant dampness are defined as: edema, lassitude, heavy sensation in the body, oliguria, anorexia, abdominal fullness, deep thready pulse, pink tongue, and a tongue coating of thin greasy fur.

According to the standard for obesity levels in the standard for diagnosing pure obesity and evaluating curative effect, mild obesity was defined as measured body weight over standard by 20%-30%, moderate obesity was defined as measured body weight over standard by 30%-50%, and severe obesity was defined as measured body weight over standard by more than 50%. Obesity level=[(actual measured body weight-standard body weight)/standard body weight]×100%.

To evaluate clinical symptoms, the Principle for Directing Clinical Research into Treatment with New Chinese Medicine (in trial use) was used. Typical symptoms of abdominal obesity with spleen deficiency and exuberant dampness are divided into four grades. A score of 0 is given to no symptoms, 2 to mild symptoms, 4 to moderate symptoms, and 6 to severe symptoms. Scores are added up to form the total score.

Inclusion standards

Patients that were included were: (a) female patients; (b) patients conforming to the standard for diagnosing abdominal obesity in Western Medicine; (c) patients conforming to the differentiation of obesity with spleen deficiency and exuberant dampness in TCM; (d) patients aged 18-65 years; (e) patients who had taken no weight loss drugs in past six months; and (f) patients that signed informed consent forms.

Exclusion standards

Patients were excluded if they were: (a) patients with secondary obesity caused by severe primary diseases in the brain and endocrine system; (b) patients with severe primary diseases and psychotics; (c) patients aged less than 18 years or more than 65 years; (d) patients...
who had taken weight loss drugs in the past six months; (e) pregnant or lactating women; (f) patients with allergic diathesis and cicatricial diathesis; and (g) patients using other weight loss therapies.

**Therapy**

According to the principle of taking points along channels in time via acupuncture at hour-prescriptive points, and in line with clinical experience, points were taken at Fuje (SP 14), Daheng (SP 15), Xuehai (SP 10), Yinlingquan (SP 9), Diji (SP 8), Sanyinjiao (SP 6), and Gongsun (SP 4) along the spleen channel. The points were located strictly in reference to The Name and Location of Points. Aseptic Huatuo brand needles, 0.25 mm in diameter and 25 mm and 40 mm in length, were used in both the treatment group and the control group. Patients were treated daily at 9-11 AM local time. Points were routinely sterilized, acupuncture was performed with the uniform reinforcing-reducing method until the needle sensation was obtained, and the needle was retained in place for 30 min before it was taken out. Acupuncture was practiced once every day for three courses of treatment with ten sessions as a treatment course. In the control group, points, needles, and the manipulating method were the same as in the treatment group. However, the treatment was carried out at any time other than 9-11 AM local time every day.

**Observations on curative effect**

Body weight, waistline, hipline, BMI, obesity level, ratio of waistline to hipline, and the total score of clinical symptoms were recorded.

**Standards for evaluating curative effect**

Curative effect was evaluated in reference to The Principle for Directing Clinical Research into Treatment of Obesity with New Chinese Medicine.¹⁰ Clinical control means that body weight was restored to standard or to overweight (which is defined as actual body weight exceeding an ideal one by 10%-20%), and clinical symptoms disappear for more than 3 months. An obvious effect means that body weight reduces by more than 5 kg and the clinical symptoms disappear. Effectiveness means that body weight reduces by more than 3 kg and the clinical symptoms are alleviated. Ineffectiveness means that the body weight reduces by less than 3 kg and no clinical symptoms are alleviated. The waistline after treatment was regarded as a primary index to be measured, and the changes in waistline, hipline, ratio of waistline to hipline, BMI, obesity level, and total score of clinical symptoms after treatment are considered as secondary indexes under measurement.

**Statistical analysis**

SPSS 16.0 (Chicago, IL, USA) statistics software was used for data analysis. t-test on independent sample was used for all measurement data. χ² test was used for qualitative data. P<0.05 is regarded statistical significance.

**RESULTS**

Sixty-five out of 72 included patients actually finished the experiment. In the treatment group, three patients dropped out and 33 finished the experiment with a rate of 67%. In the control group, four patients dropped out and 32 finished the experiment with a finishing rate of 88.89%. There was no statistical difference (P>0.05) between the completion rate among the two groups.

**Comparison of indexes under observation before and after treatment**

There were no statistical difference (P>0.05) in obesity-related indexes before and after treatment in the two groups. There was a statistical difference (P<0.01) in body weight, reduction in body weight, BMI, waistline, reduction in waistline, reduction in hipline, obesity level, total score for symptoms of spleen deficiency and exuberant dampness, and 0.01<P<0.05 in ratio of hipline to waistline before and after treatment in the two groups. This result indicates a weaker result in judgment and rejection of supposed parameter value. There were no statistical differences (P>0.05) in indexes after three courses of treatment between the two groups (Table 1, 2).

**Comparison of curative effect between the two groups**

The total effective rate was 87.5% in the treatment group and 78.8% in the control group with no statistical difference (P>0.05) between the two groups (Table 3).

**DISCUSSION**

The Internal Classic says the same about abdominal obesity as what modern medicine describes.¹⁰ TCM therapy holds that phlegm dampness produced by deficiency of the spleen and accumulation of body fluid is an important pathological factor in obesity. The pathological nature of obesity mainly manifests as deficiency in origin and excess in superficiality, and obesity is first caused by spleen deficiency. The failure of the spleen to transport and transform nutrients can cause stagnation of water to produce dampness and phlegm, giving rise to symptoms of obesity. Huang et al.¹⁰ found that acupuncture at points in the spleen channel and on the abdomen can regulate the function of the internal organs, strengthen the spleen, resolve phlegm, remove dampness, and reduce fat. Studies into the mechanism of using acupuncture to treat obesity have shown that acupuncture can regulate the function vegetative nerves, making patients with obesity feel less hungry and eat less to reduce body weight.¹¹⁻¹² Moreover, acupuncture can inhibit the hyperactive absorbing function of gastrointestinal tract to decrease the intake of calories, influence active substances to promote the dissolution of lipids, and inhibit the secretion of gastric acid.
Midnight-noon ebb-flow, a theory in acupuncture and point selection and a time medicine mainly used to direct acupuncture-moxibustion and point-selection, is mainly based on the concept of “correspondence between man and universe” in the Internal Classic. The concept uses the law governing the changes in Heavenly Stems and Earthly Branches to reckon the law governing the circulation of Qi and blood in the human body. Because the circulation of Qi and blood in the human body is closely related to the natural environment, acupuncture should also follow the law governing the changes in the universe and human body. Li et al. hypothesize that when Qi flows through a channel, the channel Qi becomes exuberant and acupuncture at that point allows Qi to easily reach the disease site to strengthen the body resistance and eliminate pathogenic factors.

In this study, acupuncture at points in the spleen channel from 9 to 11 AM, when Qi and blood in the spleen channel are most exuberant, can produce a coordinating effect between selected points and corresponding time to obtain the best curative effect. We found that

<table>
<thead>
<tr>
<th>Index</th>
<th>Group</th>
<th>Before treatment</th>
<th>After treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body weight</td>
<td>Treatment</td>
<td>63.7±6.0</td>
<td>59.2±5.6</td>
</tr>
<tr>
<td>BMI</td>
<td>Control</td>
<td>65.9±8.7</td>
<td>62.6±8.8</td>
</tr>
<tr>
<td>Waistline</td>
<td>Treatment</td>
<td>25.7±1.6</td>
<td>23.8±1.6</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>26.6±3.0</td>
<td>25.3±3.1</td>
</tr>
<tr>
<td>Hipline</td>
<td>Treatment</td>
<td>84.4±5.5</td>
<td>79.9±4.1</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>87.5±8.8</td>
<td>84.3±8.5</td>
</tr>
<tr>
<td>Ratio of waistline to hipline</td>
<td>Treatment</td>
<td>0.8±0.6</td>
<td>0.8±0.1</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>0.9±0.6</td>
<td>0.9±0.6</td>
</tr>
<tr>
<td>Obese level</td>
<td>Treatment</td>
<td>23.2±8.4</td>
<td>14.5±7.8</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>28.2±14.3</td>
<td>21.7±1.6</td>
</tr>
<tr>
<td>Total score of symptoms</td>
<td>Treatment</td>
<td>14.6±2.9</td>
<td>3.3±1.5</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>14.7±2.6</td>
<td>5.0±1.3</td>
</tr>
</tbody>
</table>

Notes: treatment group acupuncture at Fujie (SP 14), Daheng (SP 15), Xuehai (SP 10), Yinlingquan (SP 9), Dijii (SP 8), Sanyinjiao (SP 6), and Gongsun (SP 4), daily at 9-11 AM local time. In the control group, points, needles, and the manipulating method were the same as in the treatment group. However, the treatment was carried out at any time other than 9-11 AM local time every day. BMI: body mass index. *P<0.01, **P<0.01, as compared with the datum before treatment.

Table 2 Comparison of indexes before and after treatment ( ± s)

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Reduction of body weight (kg)</th>
<th>BMI</th>
<th>Reduction of waistline (cm)</th>
<th>Reduction of hipline (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>33</td>
<td>4.5±1.3</td>
<td>1.8±0.6</td>
<td>4.5±2.2</td>
<td>4.1±1.9</td>
</tr>
<tr>
<td>Control</td>
<td>32</td>
<td>3.2±0.9</td>
<td>1.3±0.4</td>
<td>3.2±1.3</td>
<td>3.1±1.2</td>
</tr>
</tbody>
</table>

Notes: treatment group acupuncture at Fujie (SP 14), Daheng (SP 15), Xuehai (SP 10), Yinlingquan (SP 9), Dijii (SP 8), Sanyinjiao (SP 6), and Gongsun (SP 4), daily at 9-11 AM local time. In the control group, points, needles, and the manipulating method were the same as in the treatment group. However, the treatment was carried out at any time other than 9-11 AM local time every day. BMI: body mass index.

Table 3 Comparison of curative effect on abdominal obesity

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Effectiveness</th>
<th>Ineffectiveness</th>
<th>Effective rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>33</td>
<td>28</td>
<td>4</td>
<td>87.5</td>
</tr>
<tr>
<td>Control</td>
<td>32</td>
<td>26</td>
<td>7</td>
<td>78.8</td>
</tr>
</tbody>
</table>

Notes: treatment group acupuncture at Fujie (SP 14), Daheng (SP 15), Xuehai (SP 10), Yinlingquan (SP 9), Dijii (SP 8), Sanyinjiao (SP 6), and Gongsun (SP 4), daily at 9-11 AM local time. In the control group, points, needles, and the manipulating method were the same as in the treatment group. However, the treatment was carried out at any time other than 9-11 AM local time every day. Z= - 2.3171; P= 0.018.
acupuncture at hour-prescriptive points is better than that of general acupuncture in reducing body weight, BMI, waistline, obesity level, and clinical symptoms of female adult patients suffering from abdominal obesity with spleen deficiency and exuberant dampness. A long-term study has shown that BMI is positively correlated to waistline in patients with abdominal obesity.\(^{15}\) In our study, we observed obvious changes in the BMI and waistline of patients in the treatment group, further indicating the superiority of the method. However, because there were few patients in this study, it is necessary to carry out further experimental studies with more patients in many centers. Studies can also be carried out to find the mechanism of using acupuncture at hour-prescriptive points, a method of midnight-noon ebb-flow, to treat female adult abdominal obesity with spleen deficiency and exuberant dampness.

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