Effects of ear acupuncture therapy for obesity on the depression of obese women

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ABSTRACT

Background Obesity is one of the leading health risks worldwide, and depression is among the leading causes of the burden of disease. These disorders are increasingly prevalent as comorbidities. Depressive symptoms are associated with obesity, and are more common in women.

Objective To evaluate the effectiveness of ear acupuncture for obesity on the depression of obese women.

Methods After baseline testing, 30 eligible patients with body mass index (BMI) >29.9 kg/m2 were included. The Beck Depression Inventory for Primary Care (BDI-PC) was used to assess changes in depression. BMI was also measured. Patients had six ear acupuncture sessions, every 15 days and were followed up for 3 months. Twenty-four patients completed the study.

Results The mean±SD age of patients was 42.9±9.0 years. Their mean±SD BMI was 39.0±4.7 kg/m2 before acupuncture, decreasing to 37.2±4.3 kg/m2 after acupuncture therapy (p<0.001). The mean depression score was 4.4±2.3 before acupuncture, decreasing to 2.7±1.4 (p<0.001) after treatment. There was no significant correlation between BMI and depression score before acupuncture therapy (p=0.104). After acupuncture therapy, no significant correlation was found between the percentage reduction of BMI and percentage reduction of the depression score (p=0.119).

Conclusions Further research into the effects of ear acupuncture in the management of obesity and depression is justified.

INTRODUCTION

Obesity is one of the leading health risks worldwide, and depression is among the leading causes of the burden of disease. Prevalence and comorbidity of these disorders are increasing.1 Depressive symptoms are commonly associated with obesity, and this association seems to be more significant in women.2

Long-term polypharmacy is often used in the treatment of the comorbid conditions obesity and depression, compounding the risk of drug-related side effects—drug interactions. Therefore, acupuncture may be considered as an option as there is some evidence of its effects on obesity3 and depression4 and it provides a significant contribution to helping patients with comorbid health problems. Research evaluating the effectiveness of ear acupuncture on obesity and associated depression is limited.

In this study, we aimed to evaluate the effectiveness of ear acupuncture for obesity on the depression of obese women.

METHODS

Study design
We conducted a prospective clinical cohort study in patients who were referred to Ataturk University Research and Practice Center for Acupuncture and Complementary Medicine in Erzurum, Turkey between March and November 2013 and who had a body mass index (BMI) >29.9 kg/m2. A total of 30 patients were considered. Men and patients with diabetes mellitus, pregnancy, endogenous obesity and/or were aged <18 years were excluded from the study. Twenty-four patients completed the study.

Intervention
Patients had six ear acupuncture sessions, every 15 days and were treated at bilateral Antiaggression and Stomach ear acupuncture points. Sterile, disposable, 0.22×1.3 mm (diameter×length) permanent needles were used, which were attached to the skin by applying gentle pressure.
The participants were asked to perform manual stimulation of all four needles 15–20 min before meals. Acupuncture needles were changed every 15 days. In addition, diets with a low glycaemic index were recommended and it was suggested that participants carried out at least 45 min of moderate-intensity activity 3 days a week.

**Outcome**
The Beck Depression Inventory for Primary Care (BDI-PC) was used to evaluate depression levels at baseline and the end of the study, at 3 months. The BDI-PC is a reliable screening test for depression, providing depression screening under seven headings: sadness, pessimism, past failure, self-dislike, self-blame, loss of interest and signs of suicidal thoughts, each rated from 0 to 3. The maximum total score is thus 21. Although no cut-off score has been reported, the likelihood of depression is >90% when the score is >4.6 The validity and reliability of the Turkish version of BDI-PC has been established.7

Anthropometric measurements were recorded for analysis every 15 days and at the end of the study. Changes in depression score are the main outcome of the study.

**Statistical analysis**
All analysis was carried out using the SPSS V.18 software. Numerical variables are expressed as mean±SD. Numerical data were checked for normal distribution. A paired samples t test was used in comparisons. The relationship between BMI and depression score was evaluated with Pearson correlation analysis. Statistical significance was set at p<0.05.

**RESULTS**
Twenty four patients, with a mean age of 42.9 ±9.0 years, completed the study. Their mean BMI was 39.0±4.7 kg/m² before acupuncture, decreasing to 37.2±4.3 kg/m² after treatment (t=5.825, p<0.001, figure 1). The mean depression score was 4.4±2.3 before acupuncture, decreasing to 2.7±1.4 after treatment (t=6.461, p<0.001, figure 1).

There was no significant correlation between BMI and depression score before treatment (p=0.104). After acupuncture no significant correlation was found between the percentage reduction of BMI and percentage reduction of the depression score (p=0.119).

Patients’ compliance with treatment was moderate with 20% dropout. No local or systemic adverse effects, of the treatment, were seen.

**DISCUSSION**
A significant reduction in depression scores was seen after ear acupuncture used for the treatment of obesity. Individual changes in depression scores did not correlate significantly with weight loss, suggesting that any effect of ear acupuncture on depression scores is not secondary to the weight loss.

Conventional therapeutic strategies for obesity are often unsuccessful in achieving adequate weight control.3 Dietary restriction produces weight loss but does not suppress the appetite. Auricular acupuncture, however, stimulates the auricular branch of the vagal nerve and raises serotonin levels, which may increase

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**Figure 1** Study summary diagram.

**BMI**—Body mass index.

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tone in the smooth muscle of the stomach, thus sup-
pressing appetite. Among other actions, serotonin
enhances intestinal motility.\textsuperscript{8} Acupuncture may also
reduce stress and depression via endorphin and dopa-
mime production.\textsuperscript{8, 9} In addition, endorphins can con-
tribute to weight loss by a lipolithic effect.\textsuperscript{9} Our study
suggests that auricular acupuncture has independent
effects on weight loss and on depression.

In a recent study it was shown that overweight or
obese young people are not at increased risk of
depression, but young people with depression are at
increased risk of obesity.\textsuperscript{10} These findings suggest that
the treatment of depression in obese patients might
help weight loss and might also contribute to preven-
tion of subsequent weight gain. Pharmacological
reatment is a common approach for treatment of
depression, but antidepressants may lead to weight
gain, which is a serious concern for patients.\textsuperscript{11} It
seems that both depression and antidepressants may
trigger obesity, emphasising the potential value of ear
acupuncture for its treatment. Furthermore, the side
effects and cost of acupuncture are low compared
with those of antidepressant drugs.

This study is limited by its small sample size and
lack of long-term follow-up beyond 3 months.

CONCLUSION

In the management of obesity and depressive symp-
toms, ear acupuncture may have independent effects
on weight loss and depression, and further research is
justified.

**Summary points**

▸ Depression often coexists with obesity.
▸ We measured depression before and after a course of
auricular acupuncture for obesity.
▸ Depression was lower after acupuncture, independ-
ently of weight loss.

**Contributors** TS participated in the development of the
protocol and analytical framework for the study, outcome
assessment, data analysis and manuscript preparation. YC had
primary responsibility for protocol development and
contributed to the outcome assessment and preliminary data
analysis. AB and GP supervised the design and execution of the
study, contributed to the final data analyses and manuscript
preparation.

**Competing interests** None.

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