

The “Senobi” breathing exercise is recommended as first line treatment for obesity

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ABSTRACT

Neuroadrenergic abnormalities, including a predominant activity of parasympathetic nerve and blunted hormone secretion, are recognized in the overweight patients. This study aimed to examine whether the “Senobi” breathing method, a stretch-breathing exercise that we have developed, could activate or recover sympathetic nervous system activity that leads to the loss of body weight. Forty pre-menopausal women, aged 40 to 50 years, participated in this study. Twenty were healthy and the other 20 were overweight (body mass index > 25 and body fat > 30%). Sympathetic nerve activity was assessed using equipment that analyzes cardiac-beat variation, and several urinary hormone levels were examined before and 30 min after performing the “Senobi” breathing exercise. The average proportion of sympathetic nerve among healthy women during daytime hours (10 : 00 AM to 12 : 00 PM) was $62.6\% \pm 2.6\%$. On the other hand, that of overweight women was $33.5\% \pm 0.4\%$. After 1 min of the “Senobi” breathing, substantial up-regulation of sympathetic nerve activity and increased urinary hormone secretion were observed in the overweight women but not in the healthy controls. Moreover, after repeating the exercise for a month, the obese patients showed significant loss of body fat. The “Senobi” breathing exercise was found to be effective for weight loss in obesity possibly by regulating the autonomic nervous system and the hormone secretion.

The prevalence of obesity is increasing to epidemic proportions worldwide. Neuroadrenergic abnormalities, such as a predominant activity of parasympathetic nerve and blunted sympathetic neural responsiveness, are recognized features of metabolic-syndrome obesity. These abnormalities play a significant role in both the pathophysiology of obesity and the adverse clinical prognosis of this high-risk population. Weight loss is recommended as first line treatment for obesity (19).

At our clinic, more than 2000 people have been

treated for obesity in the past 6 years. The main instructions for these patients were exercise and control of dietary intake. However, many patients were unable to perform exercise because of pain (especially in the knee) or fatigue. Others claimed that they did not have sufficient time for exercise. Therefore, we proposed that these patients utilize the “Senobi” breathing method. The “Senobi” movement entails raising one’s hand until it feels tired. This type of stretch was customary in ancient Japan. It can be done easily because it requires no money and very little time or space. With the “Senobi” technique, the hands, arms, and shoulders are lifted upright as firmly as possible. As a result, the muscles of the neck and back are stretched. People with poor posture have an extremely low basal metabolic rate, and they become fatigued much more quickly

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than people who have good posture (14). To prevent osteoporosis related to aging, poor posture should be corrected. Standing tall and straight has shown to be very effective for this. Standing in such a manner is very similar to the “Senobi” movement.

Numerous brown fat cells exist in the erector spinae group of the back (13), and when this area is stimulated, the brown fat cells are activated and play an important role in fat combustion. It has been suggested that the brown fat cells contribute to the improvement of various diseases, including obesity and age-related conditions (13). Activation of the brown fat cells can be confirmed by thermographic measurement (1). After performing the “Senobi” breathing for 1 min, thermography shows an increase in skin temperature of the erector spinae group between scapulas (our unpublished observation). Moreover, it is well known that both abdominal breathing and thoracic respiration are effective weight-loss methods that can be done easily (4, 12, 16–18). The present study was undertaken to determine whether the “Senobi” breathing method is an effective first line treatment for obesity in women.

METHODS

Patients. Forty pre-menopausal women (aged 40 to 50 years) participated in the study. Twenty were healthy and 20 were overweight. Overweight was defined as body mass index > 25 and body fat > 30%. None of the participants had been taking prescription drugs at the time of the study. Written informed consent was obtained appropriately from all individuals enrolled in the study. All study participants were instructed on the proper performance of the “Senobi” breathing exercise.

The “Senobi” breathing exercise. The “Senobi” breathing can be performed while standing or sitting. In the standing position, the exerciser stands still with the feet at shoulder width. The arms are extended firmly, initially without uniting the palms. The neck is bent into the back, and the upper body is bent so as to face the ceiling (Fig. 1). The exerciser must take care to avoid overexertion. This posture leads to correction of the “stoop.” Air is inhaled for 5 s, then exhaled for 5 s. This respiration pattern should be done three times; therefore, 30 s are spent in the posture described. During this posture, the scapulas shut automatically, so breathing occurs from the abdomen; this may or may not be obvious to the patient. Abdominal breathing can be proven easily by a respiration pickup device (7). To achieve



Fig. 1 The “Senobi” in a standing position.

thoracic respiration naturally, stretching with fingers intertwined and the palms turned to the ceiling is recommended. This form of breathing is the same as that mentioned earlier. In this posture, the scapulas are open, so the breathing that unites the palms is thoracic respiration. The “Senobi” breathing has two forms: fingers united and fingers not united. The “Senobi” breathing is performed for just 1 min before each meal.

Measurement of autonomic nerve activity. Autonomic nerve activity was measured by Body Checker (Medicore-Japan Co., Ltd, Tokyo, Japan). This analyzer made it possible to determine the proportion of sympathetic nerve and parasympathetic nerve of human beings, in only 180 s, while the left index finger was situated calmly inside the pulse meter.

Measurement of hormones in the urine. Urine was collected before and 30 min after 1 min of the “Senobi” breathing. Samples were sent to BML General Laboratory (Saitama, Japan), where concentrations of noradrenaline, estradiol, and growth hormone were measured. Using blood samples was deemed inappropriate because an autonomic nerve could be modified by the pain stimulation involved in obtaining blood samples.

Detection of respiration. Respiratory movements were detected by a respiration pickup device (TR-755T, SR-601S; Nihon Kohden, Tokyo, Japan) and an elastic belt containing a sensor. The belt was wrapped around the chest and lower abdomen.

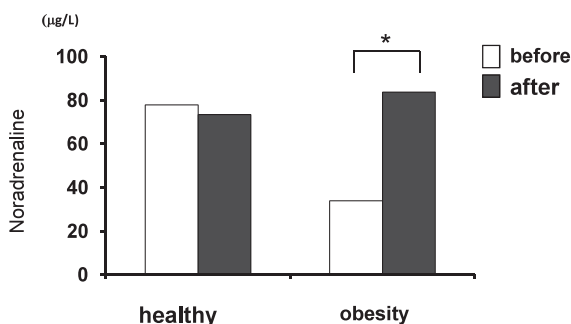


Fig. 2 Changes in urinary noradrenaline concentration after the “Senobi” breathing exercise. * $P < 0.001$.

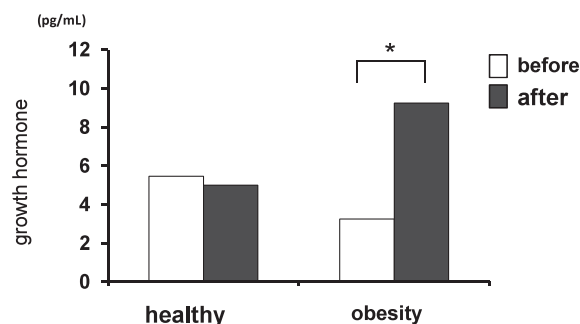


Fig. 4 Changes in urinary growth hormone concentration after the “Senobi” breathing exercise. * $P < 0.05$.

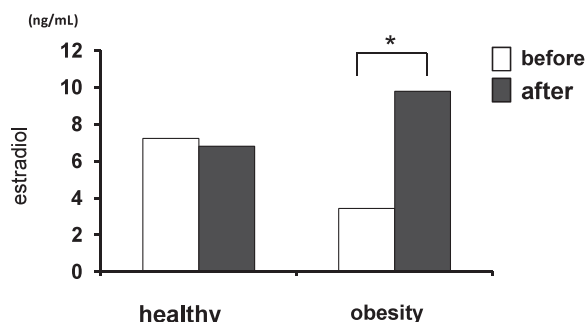


Fig. 3 Changes in urinary estradiol concentration after the “Senobi” breathing exercise. * $P < 0.05$.

RESULTS

Measurement of autonomic nerve activity

The proportion of sympathetic nerve in the healthy women was $62.6\% \pm 2.6\%$. It rarely changed after 1 min of the “Senobi” breathing ($63.5\% \pm 1.1\%$; $P > 0.1$). On the other hand, that of overweight women changed significantly (from $33.5\% \pm 0.4\%$ to $54.0\% \pm 0.3\%$; $P < 0.001$ after only 1 min of the “Senobi” breathing.

Measurement of urinary hormones

Among healthy women, there was no significant change in the urinary concentration of noradrenaline (from $79.2 \pm 2.3 \mu\text{g/L}$ to $76.32 \pm 1.6 \mu\text{g/L}$; $P > 0.1$). However, in obese women, the concentration increased significantly (from $33.9 \pm 0.4 \mu\text{g/L}$ to $64.9 \pm 1.9 \mu\text{g/L}$; $P < 0.001$) (Fig. 2). The initial urinary concentration of estradiol was $5.5 \pm 0.1 \text{ ng/mL}$ in healthy women, which changed minimally after 1 min of the “Senobi” breathing ($5.0 \pm 0.2 \text{ ng/mL}$; $P > 0.1$). However, in overweight women, significant changes were observed. Urinary estradiol increased (from $3.5 \pm 1.0 \text{ ng/mL}$ to $9.9 \pm 2.9 \text{ ng/mL}$; $P < 0.05$) (Fig. 3). The baseline urinary concentration of growth

hormone in healthy women was $7.2 \pm 1.5 \text{ pg/mL}$, and little change was observed after the “Senobi” breathing ($6.8 \pm 1.6 \text{ pg/mL}$; $P > 0.1$). In obese women, significant changes were noted (from $4.2 \pm 0.5 \text{ pg/mL}$ to $9.8 \pm 1.5 \text{ pg/mL}$; $P < 0.05$) (Fig. 4).

Loss of body fat

After 1 month of using the “Senobi” breathing method three times daily (before each meal), body fat ratios were measured. Results showed that only the obese women had significant loss of body fat ($39.0\% \pm 2.6\%$ to $35.8\% \pm 2.3\%$; $P < 0.01$).

DISCUSSION

Substantial decreases in sympathetic nerve activity occurred in the obese women but not in the healthy women. In the obese women, these changes occurred promptly after performing the “Senobi” breathing exercise. To our knowledge, such autonomic revitalization had not been possible with minimal exercise or proper breathing techniques. However, just 1 minute of the “Senobi” breathing was found to achieve this result in obese women. The MONA LISA hypothesis states that “Most Obesities known Are Low In Sympathetic Activity” (3). In the obese person, sympathetic nerve function is very low (3).

It has been shown that the obesity gene produces leptin, and that sympathetic nerve revitalization is inhibited when the action of leptin on the central nervous system is weak (9). Obesity occurs because of abnormal eating behavior, and noradrenaline plays a major role in feeding action via the beta receptor (2). It has been proposed that noradrenaline is a contributing neurotransmitter of the sympathetic nervous system. Another major role of noradrenaline is to burn fat and decrease visceral fat. In the obese women in our study, secretion of noradrenaline was

restored rapidly, and exceeded that of the healthy women after use of the "Senobi" breathing method. It is possible that a decrease in noradrenaline might be one of the causes of obesity. Restoration of noradrenaline in obese patients may be related to the effect of the "Senobi" breathing. Estrogen has the improvement action of the steatolysis action by noradrenaline, and it has been suggested that the reduced secretion of estrogen together with the decrease in ovarian function (which happens shortly before menopause) leads to obesity (20).

Estradiol in the urine was measured before and after the "Senobi" breathing method (Fig. 3). Although the problem of side effects remains with hormone-replacement therapy, it is still a common treatment for menopausal syndrome. Abdominal adiposity relates to the production of growth hormone and its decrease influences not only on obesity but also on the metabolic syndrome, type 2 diabetes, and cardiovascular conditions, which can lead to a morbid state (5, 6, 8, 21).

In addition, it has been reported that the administration of growth hormone (GH) reduces the visceral fat and low-density lipoprotein cholesterol in obese women (6). However, the use of GH has not become widespread because of the problems such as side effects and high cost. Considerable time and labor are required for the production of GH to be done safely and effectively (11, 10, 15). In our study, after performing the "Senobi" breathing exercise, only the obese women had an increase in growth hormone. In conclusion, the "Senobi" breathing method was found to be an effective technique for weight loss in overweight women via its mechanisms of up-regulating the sympathetic nerve system and increasing the secretion of various hormones. It is recommended as a first line treatment of obesity because it is effective, has no associated cost, and requires just minimal time and space. Moreover, the exercise can be used safely along with any diet method.

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