

The Role of Weight Management as First-line Treatment Modality in Obstructive Sleep Apnea of Obese Patients

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Original Research / Orijinal Araştırma

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ABSTRACT

Aim: Weight loss has been shown to improve obstructive sleep apnea and is considered the first choice of treatment. The aim of this study is to evaluate the weight-management strategies and the relationship between the weight loss and obstructive sleep apnea on obese patients.

Methods: A prospective study was applied on consecutive 50 patients with obstructive sleep apnea whose body mass indexes over 25. The first part of questionnaire form and the Epworth Sleepiness Scale scores was applied to patients by face to face interviews at first visit between November 2017 and May 2018. All of the patients who applied to the snoring polyclinic were offered weight loss. The second part of questionnaire form and Epworth Sleepiness Scale scores was applied to patients after 3 months later and the weights 3 months after weight loss recommendation were also recorded. For the statistical analysis, SPSS 15.0 program was used.

Results: All patients were offered to lose weight. 26% of them had only diet; 12% had only exercise and 12% had both diet and exercise. 50% of the patients did nothing to lose weight. 76.9% of the dieters; 100% of the exercisers and 83.3% of those who did diet and exercise, lost weight. There was a statistically significant difference between beginning and control (after 3 months) body mass indexes and Epworth Sleepiness Scale scores of the patients.

Conclusion: When weight loss is considered as the patient's attempt, along with the pursuance and maintenance, its compliance is high. Although the number of sample in our study was not suitable for generalization, we confirmed that weight loss had a positive effect on obstructive sleep apnea.

Keywords: sleep apnea syndromes, weight loss, obesity

Obez Hastaların Obstrüktif Uyku Apnesinde Birinci Basamak Tedavi Yöntemi Olarak Kilo Yönetiminin Rolü

ÖZ

Amaç: Kilo kaybının, uyku apnesini iyileştirdiği kanıtlanmıştır ve bu hastalık için ilk tedavi seçeneği olarak kabul edilir. Bu çalışmanın amacı obez hastalarda kilo yönetimi stratejileri ile kilo kaybı ve obstrüktif uyku apnesi arasındaki ilişkiyi değerlendirmektir.

Yöntemler: Prospektif tipteki çalışma, vücut kitle indeksleri 25'ten büyük, ardışık 50 obstrüktif uyku apnesi hastası üzerinde yapıldı. Anket formunun ve Epworth uykululuk skalasının ilk kısmı, hastaların Kasım 2017 ile Mayıs 2018 arasındaki ilk ziyaretinde yüzyüze görüşülerek uygulandı. Horlama polikliniğine başvuran tüm hastalara kilo vermesi önerildi. Anket formunun ve Epworth uykululuk skalasının ikinci kısmı hastalara 3 ay sonra uygulandı ve ağırlıkları da kaydedildi. İstatistiksel analiz için SPSS 15.0 programı kullanıldı.

Bulgular: Tüm hastalara kilo vermeleri önerildi. Hastaların %26'sı sadece diyet; %12'si sadece egzersiz, %12'si hem diyet hem de egzersiz uyguladı. Hastaların %50'si kilo vermek için hiçbir şey yapmadı. Diyet yapanların %76,9'u; egzersiz yapanların %100'ü ve diyet yapan ve egzersiz yapanların %83,3'ü kilo vermiştir. Kilo kaybı konusunda çaba gösteren hastaların başlangıç ve kontrol (3 ay sonra) vücut kitle indeksleri ve Epworth Uykululuk Skalası puanları arasında istatistiksel olarak anlamlı fark bulundu.

Sonuç: Kilo kaybı hastanın kendi isteği ile olduğunda, takip ve bakımla birlikte uyumu daha yüksektir. Çalışmamızdaki örneklem sayısı genelleme yapmak için uygun olmasa da, kilo kaybının obstrüktif uyku apnesi üzerinde olumlu bir etkisi olduğunu doğruladık.

Anahtar kelimeler: uyku apne sendromları, kilo kaybı, obezite

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Introduction

Obstructive Sleep Apnea Syndrome (OSAS) is a disease with recurrent airflow limitation or stasis due to airway collapse-narrowing and a decrease in blood oxygen saturation during sleep (1). Factors such as age, gender, obesity, genetic factors, alcohol, drugs and smoking are the main causes of OSAS development. Obesity is the most important risk factor that plays a role in the development of OSAS. Obesity narrows the upper airway leading to accumulation of fat tissue around the neck and pharynx (2). A tendency to dynamic upper airway occlusion has been shown in obesity (3). Approximately one-third of morbidly obese patients have OSAS findings. It has been shown that OSAS clinical manifestations improve significantly with lifestyle changes such as abstaining from alcohol and smoking and also losing weight (4). It has been shown that apneas and sleep deprivations decrease, oxygenation and daytime sleepiness are improved in OSAS patients who have lost weight (5,6). One of the most commonly used treatment modalities in OSAS patients is weight loss recommendation. The American Thoracic Society recommends that clinicians regularly assess weight and recommend weight management strategies to patients into the routine treatment of adult patients with OSAS who are overweight or obese (7). However, in most cases, patients have difficulty in weight loss. Among the reasons there are many factors such as avoiding from dieting and physical activity, making them wrong or unsuccessful, and difficulty in following diet programs, unconscious and/or inadequate diets, abandonment of smoking and alcohol, hormonal disorders, accompanying systemic diseases.

The gold standard method for the diagnosis of OSAS is polysomnography (PSG). Daytime sleepiness and snoring are the most common symptoms of OSAS (7). As with many diseases, scales may be a guide for OSAS; and Epworth Sleepiness Scale (ESS) is the widely used one because of the evaluation of daytime sleepiness (8,9). When we searched the literature about relationship between weight management and OSAS of obese patients; we saw that, all of the studies have evaluated PSG values of the patients to evaluate their

relationship. ESS is a scale and can be applied easily in polyclinics, including primary care. Because of the PSG is not available in all health facilities and is not easily accessible; we want to evaluate and compare the beginning and control ESS values of patients. The aim of this study is to evaluate the weight-management strategies and the relationship between the weight loss and OSAS on obese patients.

Methods

This study was a prospective observational study. 50 consecutive patients who applied to a Training and Research Hospital's Snoring Polyclinic and diagnosed as OSAS, and BMI over 25 were included in the study.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. For the study, permission was obtained from Derince Training and Research Hospital Clinical Research Ethics Committee.

Informed consent was obtained from all individual participants included in the study. Pregnant, menopausal patients and patients with lactation were excluded. The questionnaire consisted of 13 questions (beginning/ first part and after three months/second part) and ESS. The beginning/first part of the questionnaire consisted of questions about sociodemographic findings of patients, weight and height measurements before applying to snoring polyclinics, accompanying systemic disease, alcohol, tobacco use and the second part consisted of questions about the weights 3 months after weight loss recommendations, the status of endocrine polyclinic administration/getting professional help, diet, exercise. Body mass indexes (BMI) were calculated.

ESS which is a self-administered eight-item questionnaire has been applied to the patients in order to evaluate the daytime sleepiness and ranging between 0 and 24. A score was greater than 10 indicates subjective excessive daytime sleepiness (8). ESS was proposed by Johns (9) in 1991 and is widely used in clinical and research settings. In our study, we

applied ESS to patients at the beginning of the study and 3 months later.

The first part of questionnaire form and ESS was applied to patients by face to face interviews at first visit between November 2017 and May 2018. The primer anthropometric values of patients were recorded at first visit. The polysomnographic evaluation was performed to all patients in order to diagnose OSAS in addition to ESS. All of the patients who applied to the snoring policlinic were offered weight loss. The patients who have OSAS and were suspected as have an underlying disease, were referred to the endocrinology to investigate the additional disease. The second part of questionnaire form and ESS was applied to patients after 3 months later and the weights 3 months after weight loss recommendation were also recorded.

For the statistical analysis, SPSS (Statistical Package for Social Sciences) for Windows 15.0 program was used. Descriptive statistical methods (mean, standard deviation, frequency), Chi-square test, paired sample test were used when evaluating the data. The results were evaluated in a confidence interval of 95% and a significance level of $p < 0.05$.

Results

50 patients included in the study; 52% (n=26) were female and 48% (n=24) were male. The mean age of the patients was 47.78 ± 9.611 (min=26, max=65). There was a systemic disease in 28% (n=14) of the patients who applied to the snoring policlinic. 34% (n=17) of the patients were smoking and 6% (n=3) were using alcohol.

The beginning mean BMI of patients was 29.82 ± 4.441 kg/m². The controls mean BMI was 28.98 ± 4.410 kg/m². There was a statistically significant difference between beginning and control BMI ($p < 0.001$).

The mean ESS of the patients was 4.80 ± 3.326 (min=1, max=13) at the beginning. 12% (n=6) of the patients received 10 points and over on ESS and evaluated as excessive daytime sleepiness. The mean apnea hypopnea index (AHI) was 16.3 (min=7.8; max=32.0). The mean ESS of the patients was

4.42 ± 2.914 (min=1, max=11) at 3 months later. 6% (n=3) of the patients received 10 points and over. There was a statistically significant difference between beginning and control ESS scores ($p < 0.001$).

All patients were offered to lose weight. Weight loss strategies of patients after weight loss proposal are shown at Figure 1.

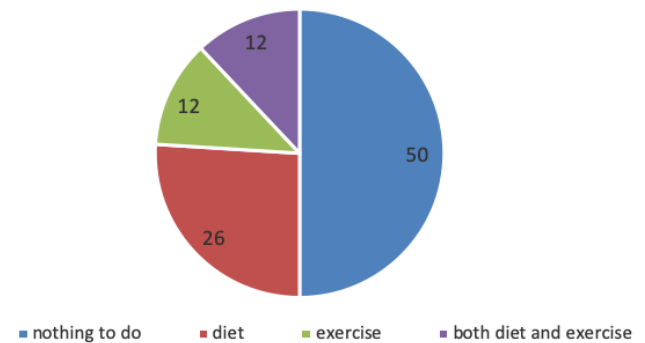


Figure 1. Patients weight loss strategies after weight loss proposal

Twenty-six percent (n=13) of the patients had only diet; 12% (n=6) of the patients had only exercise and 12% (n=6) of the patients had both diet and exercise. 50% (n=25) of the patients did nothing to lose weight. 76.9% of the dieters; 100% of the exercisers and 83.3% of patients who had both diet and exercise, lost weight. There was statistically significant difference between beginning and control BMI and ESS scores of dieters, exercisers and the patients had both diet and exercise.

16% (n=8) of the patients were referred to endocrinology because of the endocrinological problems; however, these patients were also recommended to lose weight and were included in the evaluation. 75% of these patients had at least one systemic disease. 50% of these patients had only diet, none of them had only exercise and 25% of them had both diet and exercise. The BMI and ESS changes of the patients according to weight loss method are presented at Table 1.

Although 50% of patients recommended weight loss, they did not implement any strategy. There was no statistically significant difference between beginning and control BMI and ESS scores of these patients. There was also an increase in BMI values and

ESS scores in this group and the increase in ESS scores was statistically significant.

66.6% of the patients who received 10 points and over on ESS had only diet, 16.6% of them had only exercise and 33.2% of them had both diet and exercise.

100% of these patients lost weight. There was statistically significant difference between beginning and control BMI ($p=0.003$) and ESS scores ($p=0.002$) of these patients.

Table 1. The BMI and ESS changes of the patients according to weight losing method

	BMI first visit	BMI 3 months later	p	ESS first visit	ESS 3 months later	p
Referred to endocrinology	33.02 ± 6.598	31.78 ± 6.716	0.063	4.38 ± 3.889	4.12 ± 3.482	0.317
Diet	31.82 ± 6.341	30.54 ± 6.467	0.001	5.38 ± 3.641	4.31 ± 2.983	0.005
Physical exercise	27.42 ± 1.598	25.98 ± 2.046	0.003	3.00 ± 1.798	2.17 ± 1.169	0.015
Both Diet and Physical exercise	31.04 ± 2.164	28.85 ± 3.105	0.043	6.67 ± 5.610	5.13 ± 4.665	0.042
Nothing	29.07 ± 3.753	28.91 ± 3.523	0.351	4.48 ± 2.600	4.68 ± 2.495	0.025

The beginning BMI of the patients who had systemic disease was 31.41 ± 5.499 ; control BMI of these patients was 30.50 ± 5.647 . 33.9% of these patients had only diet, 23.5% of them had only exercise and 5.8% of them had both diet and exercise. There was a statistically significant difference between beginning and control BMI ($p=0.018$) and ESS scores ($p=0.027$) of these patients.

29.4% of smokers had only diet, 11.8% of them had only exercise and 14.2% of them had both diet and exercise. There was no statistically significant difference between beginning and control BMI ($p=0.088$) and ESS scores ($p>0.05$) of smokers.

Discussion

In studies conducted in patients with OSAS, normal weight patients were mostly found as mild or moderate OSAS, whereas obese or morbid obese patients usually show severe form of the disease (10,11). Obesity increases the tendency of the upper airway collapse by reducing muscle activity and fat accumulation around the airway. Obesity increases OSAS risk by 10-14 times, the most obvious increase is seen in middle-aged adults (11). OSAS has been reported to be detected in 50-77% of obese patients in clinical practice (10-12). In the United States, it was estimated that 30-69 years of overweight or obese ($BMI \geq 25$ kg / m²) adults might be responsible for 41% of OSAS in the community (13). Weight loss is an

effective treatment method in sleep apnea. In two randomized controlled trials, 50% reduction in AHI was found in OSAS patients with moderate obesity, with 10-15% weight loss (10,12). In our study, we included patients who applied to snoring polyclinic and whose $BMI \geq 25$; so all patients had at least one symptom about OSAS at beginning evaluation; 12% of them had higher scores from ESS. So all patients were informed that it was helpful to lose weight in the treatment of the disease and it was suggested that they should lose weight and this should be on clinician-controlled basis. However, patients' weight loss activities were interrupted at 3 months later. Half of the patients had never tried to lose weight; in addition, an increase in ESS scores was observed in these patients. 100% of patients who make effort, with only diet/ with only exercise or with both diet and exercise, lost weight. Also successful results on ESS scores were obtained on patients who make effort. Also we confirm that weight loss had a positive effect on OSAS. Like our study, Pasquali et al. and some other studies reported that weight loss improves parameters and clinical presentation of OSAS in the majority of affected obese patients (13-15).

One of the important and striking result of these study was that; the smokers' success on weight loss was not effective; consequently we could not achieve successful results on snoring. However; Lundgren et al. (16) reported that smokers did not appear to have

difficulty on losing weight compared to never smokers, Murphy et al. (17) reported that smokers in a weight loss intervention had reductions in weight that were comparable to individuals who did not smoke. Although the number of sample in our study was not suitable for generalization, it was thought that the smokers might not show much will to lose weight due to the possibility of having problems related to the will/self-control. So we might say that to quit smoking has great importance in the treatment of OSAS.

One of the important points in OSAS treatment is the investigation and treatment of the presence of a concomitant systemic disease. In our study, 28% of patients who applied to snoring policlinic had a systemic disease. When we evaluate the weight loss efforts of these patients, 62,8% of them had effort for weight loss. While the reduction of BMI and ESS values of those patients at control visits were very good, the results of patients who did not try to lose weight were found to be worse. This result indicates

that OSAS symptoms may worsen when these patients do not interfere, compared with patients without systemic disease.

Conclusion

It is known that obesity is one of the most important risk factors in OSAS, and OSAS symptoms with weight loss (at least 5-6 kg) are alleviated.

As a conclusion, we found that the weight reduction is an effective treatment method in snoring and OSAS treatment. Collaboration of patient and clinician in each steps of weight loss may increase effectiveness. Also, supportive preventions should be taken such as persuading patients to lose weight, being guided in this respect, closely monitoring weight loss programs, and directing OSAS to the examination and treatment of weight loss.

It is recommended that a more detailed evaluation of the relationship between OSAS and weight loss should be studied with larger cohort studies.

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