https://doi.org/10.5664/jcsm.8384

JCSM | Journal of Clinical Sleep Medicine

COMMENTARY

A moment on the lips, a lifetime on the mask: weight-loss programs and sleep apnea

Commentary on López-Padrós C, Salord N, Alves C, et al. Effectiveness of an intensive weight-loss program for severe OSA in patients undergoing CPAP treatment: a randomized controlled trial. *J Clin Sleep Med*. 2020;16(4):503–514. doi:10.5664/jcsm.8252

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The links between obstructive sleep apnea (OSA) and obesity is well established. Weight gain has been shown to increase both the incidence and severity of OSA,[1,2] which, in turn, has potential feedback through its impact on visceral fat metabolism.[3] With the rising prevalence of obesity in our society, managing and controlling these conditions has become increasingly important.[4] As such, while continuous positive airway pressure (CPAP) remains the gold standard of therapy for OSA, weight loss should be a well-recognized adjuvant.[5,6]

Perhaps because of the challenges of implementing weight loss as a therapy, it has been somewhat unfairly neglected, especially in the setting of sleep clinics where specialized obesity management is usually not offered. This is particularly true when we consider the size of the impact of medical weight loss on the severity of sleep apnea. A population-based study of 690 people over 4 years demonstrated that a 10% decrease in weight from baseline resulted in a 26% (95% CI: 18–34%) decrease in apnea-hypopnea index (AHI), whereas a 10% gain in weight resulted in a 32% (95% CI: 20–45%) increase in AHI.[2]

Weight loss has clear benefits that extend well beyond its effects on sleep apnea. In overweight and obese patients, it results in improvements in blood pressure, glucose tolerance, serum lipids, and lipoproteins as well as markers of inflammation.[1] Within the population with sleep apnea these effects have been demonstrated to be largely independent of the effects of CPAP. Chirinos and colleagues[7] compared the combined effects of CPAP and a weight-loss intervention (involving prescribed diets, calorie restriction, and unsupervised exercise) with either treatment alone in a trial of 146 obese (BMI $\geq$ 30 kg/m^2) patients with moderate to severe OSA (AHI $\geq$ 30 events/h) over 24 weeks. Systolic blood pressure improved further with the combination of weight loss and CPAP.

In this issue of the *Journal of Clinical Sleep Medicine*, López-Padrós et al[8] approach the issue from a slightly different perspective in that they demonstrate the benefits of weight loss for patients already established on CPAP, rather than those who are treatment naive. Their findings of significant reductions at 12 months in HbA1c and C-reactive protein, as well as improvements in high-density lipoprotein support the proposition that we should be continuing to actively engage even our long-standing patients in weight-loss programs. The fact that CPAP adherence was particularly good in both arms of the trial further supports the body of evidence that these findings are independent from the effects of CPAP.[7]

The 2-phase design of the trial, with a 3-month, intensive, very-low-calorie ketogenic diet (VLCD) followed by a 9-month hypocaloric diet, should be highlighted for several reasons. In extending out the duration of the trial beyond that of many other trials examining obesity and OSA[7,9,10] the authors made the results more applicable to the real-world application of weight-loss programs in this population. We should highlight that, although the participants in the study by López-Padrós et al experienced a slight rebound in weight after stepping off the VLCD onto a Mediterranean diet, they were able to maintain a significant amount of weight loss out to 12 months, with a mean 8.2 kg lost from baseline.

The program's success is similar to that enjoyed by Cayanan et al,[11] who compared 2 maintenance diets (the Australian Guide to Healthy Eating diet and the low-glycemic-index high-protein diet) following 2 months of a VLCD in 42 obese patients with moderate–severe OSA. They found similar efficacy between consolidation diets and that, although there was a small but significant weight gain at 12 months, weight loss from baseline persisted along with reductions in AHI. One of the constant battles for our patients and for us as clinicians is the unfortunate factor that weight loss following dietary and lifestyle interventions tends to decline to < 5 kg from baseline after 2–3 years following intervention.[12] Given the more extended duration of the weight-loss program compared with most, we hope to see follow-up data in years to come to see if the weight loss and other benefits persist now that the participants are hidden from the watchful eyes of the dietitians and study coordinators.

While the AHI reductions in the treatment arm were impressive, they remain in line with previous findings for weight

loss of a similar magnitude.[3,5] What the authors struggled to explain was the surprising reduction in AHI of 13.5 events/h among their controls, despite no apparent change in weight or other major metric that could easily explain this. This understandably blunted the significance of the comparison of AHI and warrants further investigation. Of note, the participants in the intervention arm appeared to enjoy a significantly higher proportion of rapid eye movement (REM) sleep than their control counterparts and had less hypoxia, although this effect, too, was blunted at the 12-month mark. It is hard to know whether these effects are, in part, due to the smaller sample size of the trial.

One of the major limitations of this and many other trials investigating weight-loss programs and OSA is that the study population is heavily skewed toward middle-aged, Caucasian men.[9–11] The median age in the López-Padrós et al trial was ~50 years, with narrow interquartile ranges in both arms. All participants were Caucasian and 88% (30/34) were men. While the findings of reduction in AHI and improvements in cardiometabolic markers were in line with those of larger studies with broader participant groups[2,7] it does potentially limit the generalizability of the study to the general population. Certainly, the literature would benefit from longer and larger studies into weight-loss interventions in OSA.

What is becoming increasingly clear is that we need to continue to strongly advocate weight loss for all our patients, regardless of the severity of their OSA or adherence to our other therapies. The benefits of weight loss are, to a degree, unquestionable. This study highlights that tangible benefits can be obtained with weight-loss interventions. The challenge, as always, lies in the implementation of our lofty goals.

CITATION

Ainge-Allen HW, Yee BJ. A moment on the lips, a lifetime on the mask: weight-loss programs and sleep apnea. *J Clin Sleep Med*. 2020;16(4):471–472.

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SUBMISSION & CORRESPONDENCE INFORMATION

Submitted for publication February 13, 2020
Submitted in final revised form February 13, 2020
Accepted for publication February 13, 2020
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DISCLOSURE STATEMENT

Both authors have seen and approved the manuscript. The authors report no conflicts of interest.