



Capitol Sleep Medicine Newsletter

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OSA and American Diabetes

The increase in obesity has become an epidemic in America. What is the relationship among weight, obstructive sleep apnea (OSA) and type II diabetes mellitus? Weight is a clear risk factor for the development of obstructive sleep apnea OSA¹ as well as for Type II diabetes.² A recent study has revealed that although body mass index is a significant independent risk factor for developing OSA, diabetes itself may be a significant independent contributor to the risk of OSA and that most are of these patients remain undiagnosed.³

Why does a combination of OSA and diabetes matter? Cardiovascular disease is a major contributor to morbidity and mortality in patients with type 2 diabetes.⁴ The formation and accumulation of advanced glycation endproducts (AGEs) as measured by HbA1c has been implicated in the progression of diabetes and atherosclerosis. This may be important in patients with OSA who have not formally been diagnosed with diabetes. A recent study revealed that serum levels of AGEs were increased in nondiabetic subjects with OSA and correlated with the severity of OSA.⁵ Treatment of OSA can improve this. In another study HbA1c levels before therapy with CPAP was 7.8+/-1.4% and decreased to 7.3+/-1.3% after 134+/-119 days of therapy (p<0.001). The authors concluded that treatment with CPAP leads to a clinically significant drop in HbA1c in patients with type 2 diabetes mellitus and severe OSA.⁶

OSA may also adversely affect patients with DM through decreased insulin sensitivity. A subgroup of a study of 179 patients with type II diabetes, of which 70% were found to have moderate or severe OSA, was treated with nightly CPAP for 4 months. Insulin responsiveness improved in those patients who received CPAP treatment.⁷ Another study demonstrated that for subjects who used CPAP for more than 4 hours per day the reduction in HbA1c level was significantly correlated



with days of CPAP use. Interestingly, this relationship was not true for patients who used CPAP for less than 4 hours per day.⁸

Can weight loss improve diabetes? A recent study demonstrated that weight loss was the dominant predictor of reduced diabetes incidence; specifically, for every kilogram of weight loss, there was a 16% reduction in risk, adjusted for changes in diet and activity. Not surprisingly, increased physical activity was important to help sustain the weight loss. Among 495 participants not meeting the weight loss goal at year 1, those who achieved the physical activity goal had 44% lower diabetes incidence. The authors concluded that interventions to reduce diabetes risk should primarily target weight reduction.⁹

Can weight loss improve OSA? A study looked at the effect of weight loss following laparoscopic adjustable gastric banding on the changes in the apnea-hypopnea index (AHI) in 25 severely obese patients with severe OSA. In this study, the preoperative baseline mean body mass index 52.7 kg/m squared. The second sleep study was conducted 17.7+/-10 months after surgery and mean percentage of weight loss was 15% (range 24-80%). In these patients there was a mean decrease in the AHI from 61.6 to 13.4. Other findings were improved sleep architecture with increased REM and stage III and IV sleep, improved daytime sleepiness as measured by Epworth Sleepiness Scale, and fewer patients requiring treatment with CPAP. The conclusions of this study were that weight loss provides major improvement or resolution of OSA, decreases CPAP therapy requirement, and improves quality of life.¹⁰

Perhaps it is time for Americans to thin down a bit. Happy Thanksgiving! (Don't eat too much!)

¹ World J Surg. 1998 Sep; 22(9):998-1001

² Diabetes Care. 1999 Aug; 22(8):1266-72.

³ Thorax. 2006 Aug 23; [Epub ahead of print]

⁴ Diabetes. 2006 Jul; 55(7):1985-94.

⁵ Sleep. 2006 Mar 1; 29(3):329-33.

⁶ Sleep Breath. 2005 Dec; 9(4):176-80.

⁷ J Clin Endocrinol Metab. 1994 Dec; 79(6):1681-5.

⁸ Arch Intern Med. 2005 Feb 28; 165(4):447-52.

⁹ Diabetes Care. 2006 Sep; 29(9):2102-7

¹⁰ Int J Obes (Lond). 2005 Sep; 29(9):1048-54

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