

Sleep Apnea Awareness Newsletter

FALL 2007

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SLEEP APNEA, WEIGHT GAIN AND DIABETES

by Margaret Trussler, MS, APRN, BC

Mr. Jones has been struggling with his weight for years. No matter what diet he has tried, he has never been able to reach his goal weight. Even if he is able to lose a few pounds, he just can't seem to keep the weight off. He has never been one to exercise even though he knows it would probably help with weight loss. By the time he gets home, he feels too exhausted to exercise. Even a short walk seems like an insurmountable chore. Six months ago, his physician told him that he had type II diabetes and started him on medication to bring down his blood sugar. Last week he also discovered he has sleep apnea. He feels frustrated and discouraged about having "so many medical problems." He recently read an article about the relationship between weight and sleep apnea and is wondering if the apnea may have caused his weight problem. He asks his doctor if using PAP therapy will help him to lose weight and improve his blood sugar.

Multiple studies show that being overweight is the strongest risk factor for developing obstructive sleep apnea (OSA). However, there is now evidence to suggest that OSA itself may influence whether an individual develops weight problems and type II diabetes. Recent studies show a link between OSA and abnormal metabolism of blood sugar. Body cells can become resistant to the action of the sugar-regulating hormone insulin, a condition known as insulin resistance. Insulin resistance occurs more commonly in patients with OSA and is an early step in the development of type II diabetes. The link between OSA and insulin resistance is important as it may point to OSA as a risk factor for the development of type II diabetes and obesity. For many people with OSA, it raises the interesting question of treating OSA to improve blood sugar control and help with weight loss.

Understanding insulin resistance

The exact link between OSA and insulin resistance remains unclear but is likely to involve multiple complex processes. Under normal conditions, insulin is released in response to the ingestion of glucose (sugar) in the form of food. Insulin functions like a key that allows cells to open, take glucose out of the blood and use it for energy. Insulin's main job is to keep the level of sugar in the blood within safe levels. Insulin resistance occurs when the cells require higher amounts of insulin in order to let in the same amount of glucose. Insulin resistance also raises blood sugar levels. The glucose-using cells become immune to the action of insulin and insulin-producing cells produce excessive amounts of insulin. High levels of insulin and blood sugar result in weight gain and further difficulties with glucose metabolism.

OSA and insulin resistance

In OSA, airway closure causes breathing to stop and oxygen levels to drop. This stresses the body and causes the release of stress hormones. These stress hormones elevate blood glucose levels many times each night and cause the production of high levels of insulin. As we have already learned, high insulin levels result in weight gain. People who feel sleepy and fatigued from OSA don't exercise as much, making them more likely to gain weight and further increasing the chance of developing insulin resistance. Obesity and insulin resistance can progress to type II diabetes. Conversely, insulin resistance and type II diabetes contribute to additional weight gain and worsening OSA. The relationship between weight, type II diabetes, and OSA seems to be a vicious cycle.

Two large, well-documented studies support the link between OSA and insulin resistance. The first study, by Ip and colleagues (2002), followed 270 people referred for sleep studies who did not have diabetes. They discovered that the severity of OSA was associated with insulin resistance. That is, the worse the apnea, the more likely the person was to have high levels of insulin and blood sugar. This association between OSA and insulin resistance was seen in both obese and non-obese subjects.

Data from the Sleep Heart Health Study (Punjabi et al, 2004) further support the relationship between OSA and insulin resistance. This large study also showed that OSA is associated with abnormal glucose metabolism and insulin resistance even when other contributing factors such as age, gender, smoking, weight, waist size, and amount of sleep each night are taken into account. As in the study by Ip and colleagues, the more severe the OSA, the more likely the person was to develop insulin resistance.

Will PAP therapy help with weight loss and blood sugar control?

Early studies did not show that treatment of OSA with CPAP therapy improved insulin and glucose regulation. However, in most of these studies people used CPAP for only a short period of time, from only one night to a maximum of 6 months. It is possible that since it takes many years for insulin resistance to develop into diabetes, recovery may also take a long time. Still, some studies show promise that treatment of OSA may improve insulin resistance. A study published recently by Babu and colleagues (2005) demonstrated that CPAP use improved blood sugar control in very obese individuals with type II diabetes. Importantly, a strong relationship was seen between blood sugar control and adherence to CPAP therapy. Specifically, there was a greater improvement in glucose levels in those individuals using CPAP for more than four hours per night.

During his first visit to the sleep clinic, Mr. Jones discusses his concerns about his diabetes and weight gain with his physician. While the exact nature of the relationship between diabetes, weight, and OSA is not fully understood, there is currently enough evidence to suggest a strong relationship between OSA, diabetes, and obesity and that treatment of OSA may improve glucose metabolism and prevent further weight gain. While many individuals may experience a dramatic response to complaints of fatigue, sleepiness, and sleep disturbance, improvement in blood sugar and impact on weight may take several months or longer. Consistent nightly use of PAP therapy should result in improvement in energy levels that may motivate the individual to increase activity and exercise. Exercise clearly plays a key role in weight loss and improved blood sugar control. For these reasons alone it is worthwhile to work aggressively at accepting and adhering to PAP therapy.

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For more information, visit the new Sleep and You website.



CPAP COUNSELOR'S CORNER

CPAP AND WEIGHT LOSS

by Stephen Olson, RRT RPFT

When 29-year-old Mr. Smith came to Sleep HealthCenters for his first CPAP setup, he weighed 306 lbs. He was severely deconditioned and required supplemental oxygen. Even the smallest activity put stress on his body and left him short of breath. Mr. Smith was unable to hold a permanent job and rarely left his third floor apartment.

Mr. Smith had a very disruptive sleep cycle and was diagnosed with severe sleep apnea, as well as low oxygen saturation while sleeping. He was prescribed CPAP therapy to treat his sleep apnea.

During his CPAP setup visit, he was instructed on the proper use of the CPAP equipment and the benefits of nightly use were reviewed. I explained to him the severity of his problem and advised him that untreated sleep apnea could lead

to bigger health issues later in life. Mr. Smith was skeptical and reluctant to use his CPAP setup, but agreed to try.

At our first follow up visit, Mr. Smith informed me that he was not using his CPAP very much because the mask was uncomfortable and he had trouble tolerating the 14cm of pressure. He was refitted with a different style of facemask and I reviewed the system features that would help lessen the pressure while he was falling asleep, making it easier to tolerate. Once again, Mr. Smith agreed to try using the CPAP on a nightly basis. We scheduled another follow-up visit and he was instructed to call me if he still had problems

Several months later when Mr. Smith came for his next follow up visit, he was over 100 lbs lighter! He informed me that after we dealt with his mask and pressure issues, which many people experience when first using CPAP, he was able to use the CPAP nightly. He was sleeping better, felt more rested when he woke up, and even started walking several times per week.

Since he had not been to his physician since he lost weight, I encouraged him to visit his doctor to discuss a retest to check his pressure needs. A second sleep study was scheduled, and as expected, a decrease in his pressure was warranted and he no longer needed supplemental oxygen.

According to Mr. Smith, he is feeling better than ever and ensured me that he would continue his CPAP treatment as it has changed his life.

Stephen Olson, RRT RPFT
CPAP Counselor
Sleep HealthCenters

If you have a story you would like to share in our newsletter or on our website, please submit it to sleepwell@sleephealth.com.

GET TO KNOW YOUR STAFF

Stephen Olson, RRT RPFT, has worked as a respiratory therapist for over 25 years. Most recently, he was providing home CPAP therapy. Prior to that, Steve held positions at UMass Medical Center, including staff therapist, pulmonary function technologist, and pulmonary procedures technician.

He has been honored by the State of Massachusetts with the Pride in Performance award and has been listed in the Cambridge's Who's Who Executive and Professionals Registry. He brings to Sleep HealthCenters a well-rounded respiratory background that he hopes to share with his patients. He grew up in Worcester and lives there today with his wife and two children.



CEO SPOTLIGHT

by Paul S. Valentine
President and CEO

Sleep HealthCenter at Massachusetts Eye and Ear Infirmary

We are thrilled to announce the opening of our first pediatric sleep center at Massachusetts Eye and Ear Infirmary. The new two-bedroom diagnostic sleep lab is one of only a few in the area that specialize exclusively in children up to 18 years of age. We are currently in discussions to provide clinic services in association with the center, which will make the Sleep HealthCenter at Massachusetts Eye and Ear Infirmary one of a limited number of comprehensive pediatric sleep centers in the country.

Facilities

For those of you who live in or near Worcester, we will be moving our Worcester location in mid-November to 102 Shore Drive. If you have an appointment scheduled, you will get detailed information and directions to the new location in the near future.

We have also opened a CPAP Clinic in the office of Dr. Arun Rajan, Medical Director of the Sleep HealthCenter affiliated with Southcoast Hospitals Group. The clinic location is 88 Faunce Corner Road in North Dartmouth, MA. For more details or if you would like to make an appointment, please call our scheduling office at 877-SLEEPHC (877-753-3742).

Finally, we are now targeting January 2008 for the opening of a new center affiliated with Marlborough Hospital in Marlborough, MA.

Sleep and You

We would like to take this opportunity to introduce you to our new educational outreach program, "Sleep and You". Impaired sleep habits can have serious long-term health effects. Most sleep disorders are chronic diseases and many of the co-morbidities associated with sleep disorders are chronic. Recent research supports the integration of sleep medicine and disease management programs related to obesity, diabetes, cardiovascular disease, stroke, and others.

The Sleep and You initiative targets both referring physicians and patients to accomplish the following goals:

- Improve awareness about the interplay between sleep and chronic diseases, as well as sleep as it relates to specific patient populations
- Help patients better understand how sleep can affect their individual lives
- Educate patients and referring physicians to understand that sleep needs to be evaluated due to certain chronic diseases or biological changes in the natural course of patients' lives
- Incorporate new clinic and lab-based activities to support these programs while providing physicians with additional patient care service offerings

The "Sleep and You" program includes a new website (www.sleepandyou.com), a series of brochures, physician presentations, and other educational outreach activities. Initial topics include Sleep and Diabetes, Sleep and Cardiovascular Disease, Sleep and Weight Management, Sleep and Surgery/Anesthesia, Sleep and Stroke, and Sleep and Menopause. We welcome your questions and interest in learning more about "Sleep and You".

Sleep Apnea Support Groups

We have been receiving excellent feedback from attendees of the Sleep Apnea Support Group meetings and we encourage you to attend. The next meeting is scheduled for November 7, 2007, 6:30-8:00 PM at the Melrose Wakefield Hospital (Perkins Hall), 585 Lebanon Street, Melrose, MA. Special Guest Speaker is Douglas B. Kirsch, MD, Regional Medical Director, Sleep HealthCenters.

Our dedicated [medical and clinical team](#), includes physicians, psychologists, nurse practitioners, respiratory therapists and sleep technicians. Sleep HealthCenters has grown to become the largest provider of sleep medicine services in [Massachusetts](#) with 12 convenient locations, and one in [New York](#). As we continue to grow, I will update you on any new locations and introduce you to new clinical staff.

We hope this seasonal e-newsletter will be helpful to you, and we look forward to providing you with the best care possible so that you can sleep well. Please feel free to contact anyone on our staff if you have questions.

Paul S. Valentine
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