In Managing Diabetes, Track and Treat Sleep Apnea

BY MIRIAM E. TUCKER
Senior Writer

ST. LOUIS — Sleep apnea assessment and treatment should be considered an integral part of diabetes management, Susan M. LaRue, R.D., said at the annual meeting of the American Association of Diabetes Educators.

"Sleep apnea is highly prevalent in people with diabetes, people with hypertension and obesity, all of which we see in huge numbers in our patient population," said Ms. LaRue, a certified diabetes educator with Amylin Pharmaceuticals.

What's more, data suggest that the majority of obstructive sleep apnea (OSA) cases among people with and without diabetes are undiagnosed, she said.

Because sleep apnea is so common in people with diabetes—concomitant with obesity and hypertension—the Scripps' Whittier Institute for Diabetes, La Jolla, Calif., has instituted a "best practice" in which every patient is screened for OSA, and those found to have the condition are referred for treatment and follow-up.

In a study published by the Whittier's Dr. Daniel Einhorn and his associates, 72.4% of 279 adults with type 2 diabetes were found to have some degree of sleep apnea, defined as an apnea-hypopnea index (AHI) of five events or more per hour. Over a third of the patients (35.8%) had an AHI of at least 15 events per hour, a more severe apnea level associated with a doubling of the risk for the development of hypertension after adjustment for comorbidities such as body mass index (BMI), alcohol use, and cigarette smoking (Endocrine Practice 2007;13:355-62).

The proportion of those with an AHI at or above 15 events per hour was much higher among men than women (49% vs. 21%). Other significant risk factors included age 62 years and older, a BMI of 30 kg/m^2 or greater, snoring, and reports of stopped breathing during sleep, said Dr. Einhorn, also with the University of California, San Diego, and his associates.

'When sleep apnea is treated appropriately, look at the benefits. ... It's another tool to help patients live [more healthily] with diabetes.'

That study and the symposium in which Ms. LaRue spoke were both sponsored by the ResMed Corp., which manufactures continuous positive airway pressure (CPAP) devices for treatment of OSA.

Diabetes is among several cardiovascular-related conditions that are strongly associated with OSA. Data suggest that OSA is present in about 80% of individuals with drug-resistant hypertension (35% of all hypertension), in 50% of those with congestive heart failure, and in 50% of those with atrial fibrillation. It is found in 77% of the morbidly obese population.

The mechanism for the association is not known, but theories focus on the increased sympathetic nervous activity resulting from repeated apneas. The resulting higher cortisol levels are related to insulin resistance, which predisposes to impaired glucose tolerance and other cardiovascular risk factors, said Ms. LaRue, formerly with the Whittier Institute.

A study in which the results of overnight polysomnography and oral glucose tolerance testing were compared in 30 obese (but not diabetic) patients with OSA and in 27 equally obese individuals without OSA showed that those who had OSA were more insulin resistant, independent of the degree and distribution of adiposity. The authors hypothesized that the worsening in insulin sensitivity in the OSA patients could reflect the hypoxic state and would account for the increased vascular risk (Clin. Endocrinol. 2003;59:374-9).

Treatment of OSA with CPAP not only reduces apneic episodes and improves sleep quality, but also appears to improve the cardiovascular and metabolic abnormalities. In a German study of 60 patients with moderate to severe OSA, those who were given "therapeutic" levels of CPAP for an average of 9 weeks had a 95% reduction in apneas and hypopneas and a decrease in mean arterial blood pressure of 9.9 mm Hg.

That level of decline would be predicted to reduce coronary heart disease event risk by 37% and stroke risk by 56%, the authors wrote (Circulation 2003;107:68-73).

Insulin sensitivity was significantly improved at 2 days and at 3 months of CPAP therapy among 40 patients with an AHI greater than 20, more so among those with BMIs less than 30 kg/m^2 than among those with higher BMIs (Am. J. Respir. Crit. Care Med. 2004;169:156-62).

Another study of 25 patients with type 2 diabetes and sleep-disordered breathing demonstrated that an average of 83 days' treatment with CPAP significantly reduced postprandial glucose values, by about 60 mg/dL after each meal. Hemoglobin A_{1c} (HbA_{1c}) levels also dropped significantly among those with a baseline level greater than 7% (from 9.2% to 8.6%). Reduction in HbA_{1c} was significantly correlated with days of CPAP use among those who wore the device for more than 4 hours per day (Arch. Intern. Med. 2005;165:447-52).

"When sleep apnea is treated appropriately, look at the benefits. ... It's another tool to help patients live [more healthily] with diabetes," Ms. LaRue noted. ■

Cut Caffeine for Better Glucose Control in Type 2 Patients

BY MIRIAM E. TUCKER
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ST. LOUIS — Convincing your diabetic patients to stop consuming caffeine could significantly reduce their postprandial glucose levels and possibly improve their overall metabolic control, Richard S. Surwit, Ph.D., said at the annual meeting of the American Association of Diabetes Educators.

It has long been known that caffeine increases blood pressure, heart rate, and levels of stress (also known as "counterregulatory") hormones, which in turn are associated with reduced insulin sensitivity. In two placebo-controlled studies designed to look specifically at the impact of oral caffeine on carbohydrate metabolism in regular coffee drinkers with type 2 diabetes, Dr. Surwit and his associates at Duke University, Durham, N.C., have shown that although caffeine does not appear to affect fasting blood glucose levels, it has a major impact on both 2-hour postprandial glucose values and insulin levels. The lead author of both studies was James D. Lane, Ph.D., professor of medical psychology at Duke.

Indeed, the magnitude of the effect is in the range of glucose-lowering medications that are taken before meals, such as nateglinide and acarbose, said Dr. Surwit, professor and chief of the division of medical psychology, and vice chairman of the department of psychiatry and behavioral sciences at Duke.

"If you get your patients off caffeine, you can have a 20% improvement in postprandial glucose, for free. ... You can't get that effect without spending a few dollars a day for a pill. Here, you're getting it without adding anything to their regimen, just taking something away," Dr. Surwit remarked.

In the first study, 14 habitual coffee drinkers with type 2 diabetes were given gelatin capsules of either 125 mg of anhydrous caffeine plus dextrose filler or the filler alone on 2 days within a 2-week period. After fasting blood was drawn, they ingested 250 mg of caffeine or placebo in two capsules with water, and another fasting blood sample was taken an hour later. The patients then consumed a liquid meal containing 75 g of carbohydrates (Boost), and additional blood samples were taken at 1 and 2 hours after the meal (Diabetes Care 2004;27:2047-8).

Caffeine did not affect the fasting levels of plasma glucose or insulin, compared with placebo. After the liquid meal, however, glucose levels were 21% higher and insulin levels were 48% higher when the patients had consumed caffeine before the meal, compared with when they hadn't.

The second study was designed to overcome the first study's limitation of using caffeine-containing capsules rather than real coffee or tea, both of which contain numerous organic compounds that might independently affect glucose tolerance positively or negatively. This time, another group of 20 patients with type 2 diabetes who were also regular coffee drinkers were given decaffeinated coffee with or without 250 mg of anhydrous caffeine dissolved into it, roughly equivalent to a 16-ounce mug of regular brewed coffee. This method allowed for precise control of caffeine content and equivalence of other chemical compounds present in coffee—such as magnesium and roasted quinides—that might influence blood sugar levels, said Dr. Surwit, who is also codirector of Dukes' Behavioral Endocrinology Clinic.

Again, there was a significant postprandial effect: The mean glucose value following caffeine consumption was 28% higher than it was without caffeine, and the mean insulin values were 19% higher than they were without caffeine (Endocr. Pract. 2007;13:239-43).

The magnitude of the effect was not related to age, body weight, body mass index, hemoglobin A_{1c}, fasting plasma glucose, or the usual amount of caffeine consumed. The only correlation was with duration of diabetes: The difference between caffeine and placebo grew by 0.17 mmol/L every 2 hours for each year of diabetes history among the patients. The authors speculated that this could be because patients with a longer duration of diabetes would have less available insulin reserve, which would result in a reduced capacity to overcome the insulin resistance caused by the caffeine.

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DR. SURWIT

These findings do not conflict with highly publicized studies suggesting that coffee drinking might reduce the incidence of type 2 diabetes (JAMA 2005;294:97-104), because those data are correlational and not causal—people who drink more coffee might eat less, for example, Dr. Surwit pointed out.

It has not been shown whether or not cutting caffeine can result in a significant improvement in overall metabolic control, but increasingly, data suggest that postprandial glucose values may influence HbA_{1c} to a greater extent than do fasting levels. Dr. Surwit's group hopes to do that study next.

Getting patients to quit drinking caffeine may be tricky, but it's not impossible. "The idea that people need caffeine to stay alert and be productive and be active is nonsense," said Dr. Surwit. Patients will experience headaches and irritability for a few days, after which those symptoms go away. "It doesn't take more than 3 or 4 days to get people completely off caffeine." ■

DR. SURWIT is the author of "The Mind-Body Diabetes Revolution," which teaches patients methods of reducing stress hormone levels to obtain better glucose control. Information is available at www.richardsurwit.com.