Childhood Cancer Survivors Have More Diabetes

BY MARY ANN MOON
Contributing Writer

Survivors of childhood cancer—particularly those who have undergone total body irradiation in preparation for bone marrow transplant—have increased rates of hyperinsulinemia, impaired glucose tolerance, and diabetes mellitus in adolescence and young adulthood, reported Dr. Kristen Neville of the University of New South Wales, Sydney, and her associates.

The researchers assessed 248 survivors of childhood cancer who had been treated initially at Sydney Children's Hospital during 1971-2000 and had regularly attended follow-up clinics.

Overall, 18% of the survivors had developed hyperinsulinemia, impaired glucose tolerance, or diabetes mellitus by the time they reached puberty or young adulthood. Many were asymptomatic and were diagnosed only because they were screened for this study, Dr. Neville and her associates said.

The findings suggest that a metabolic abnormality becomes established early in these individuals, and that a simple measurement of the waist-to-height ratio can be used to screen for that abnormality well before it emerges clinically years later. Early dietary and lifestyle interventions might then prevent or delay the onset of hyperinsulinemia, impaired glucose tolerance, and frank diabetes, the investigators said (J. Clin. Endocrinol. Metab. 2006;91:4401-7). The results also indicated that some survivors of childhood cancer begin showing increased abdominal adiposity and adverse lipid changes before or during puberty, even though their rates of overweight and obesity are the same as those of control subjects at that age.

At the time when the cancer survivors were evaluated for this study, in 2002-2004, their median age was 18 years, and the median interval since cancer diagnosis was 13 years; 36 subjects were prepubertal, 88 were pubertal, and 124 were young adults. The subjects were at least 2 years past their cancer diagnoses and had been disease free for a minimum of 1 year.

Patients who had undergone bone marrow transplantation accounted for more than half of those who had developed diabetes, hyperinsulinemia, or impaired glucose tolerance. This suggests that total body irradiation conditioning should be reconsidered. "If alternative conditioning therapies for bone marrow transplant can be considered without compromising survival, the risk of metabolic abnormality may be decreased," the investigators said.

The median fasting insulin levels in the prepubertal and pubertal subjects were approximately twice those of controls. In addition, 23% of the pubertal subjects had hyperinsulinemia, impaired glucose tolerance, or diabetes mellitus, compared with none of the controls in that age group.

The prevalence of abdominal adiposity among the prepubertal and pubertal cancer survivors was double that of matched control subjects. The cancer survivors had similar body mass index values, but higher waist:height ratios. Accumulation of abdominal fat was also seen in the adult cancer survivors.

This suggests that rather than a high BMI, a waist:height ratio of 0.5 or greater "may be an early and simple clinical marker for the later development of the metabolic disturbance," the researchers noted. ■

Sleep Apnea Associated With Hyperglycemia in Diabetes

BY MIRIAM TUCKER
Senior Writer

COPENHAGEN — Sleep apnea appears to have an immediate elevating effect on nighttime blood glucose levels in people with concomitant type 2 diabetes, Dr. Maria Pallayova said at the annual meeting of the European Association for the Study of Diabetes.

Previous studies have documented the independent association between sleep-disordered breathing (SDB) and abnormal glucose metabolism. However, the findings of this study, which used continuous glucose monitoring, provide a closer look at the immediate glycemic response to apneic episodes.

'Obstructive sleep apnea is not only obstruction; it is a cardiovascular and metabolic nightmare.'

DR. PALLAYOVA

Medtronic/Minimed's continuous glucose monitoring system (CGMS) was used for several days in 30 patients with type 2 diabetes on diet or oral hypoglycemic therapy. Eight of the patients had severe SDB and a mean hemoglobin A_{1c} level of 7.4%. The other 22, who did not have SDB, had a mean HbA_{1c} level of 6.5%. Those with SDB were referred to a sleep laboratory for overnight polysomnography, and the CGMS data were compared between the two groups, said Dr. Pallayova of the Pavol Jozef Safarik University, Kosice, Slovakia.

In the group without SDB, the CGMS revealed stable normoglycemia throughout the night. In contrast, those with severe untreated SDB had frequent episodes of sleep apnea/hypopnea (mean apnea-hypopnea index 57.64 episodes/hour) with severe oxygen desaturation (oxygen saturation 82.5%, minimal oxygen saturation 49.13%), followed by significant increases in blood glucose of up to 12.3 mmol/L (221 mg/dL).

The nocturnal increment in blood glucose was 1.11 mmol/L (19.98 mg/dL) in the SDB group, significantly greater than the value of 0.2 mmol/L (3.6 mg/dL) seen in the patients without SDB, and was strongly correlated with severe oxygen desaturation. The peak of apnea-induced hyperglycemia tended to occur within 1 hour of severe oxygen desaturation, and the hyperglycemia lasted for a mean of 48 minutes post hypoxia before returning to normal, Dr. Pallayova noted.

The researchers found significant differences in both overall mean nocturnal glucose values—8.24 mmol/L (148.3 mg/dL) in the severe SDB group, compared with 6.15 mmol/L (110 mg/dL) in those without sleep apnea—and morning fasting glucose levels (8.01 vs. 6.6 mmol/L [144.2 vs. 118.8 mg/dL]).

However, there were no significant differences between the groups in daytime CGMS glucose levels, and no associations were seen between arousal frequency and nocturnal hyperglycemia, she reported.

"Obstructive sleep apnea is not only obstruction; it is a cardiovascular and metabolic nightmare," Dr. Pallayova said.

"We have to be aware of the fact that untreated sleep apnea may adversely influence glucose control and contribute to the development of late diabetes complications," she added. "Both sleep-disordered breathing and diabetes mellitus are common, serious, treatable, and underdiagnosed, and they require a high index of suspicion." ■

Guided Breathing Device Lowers Blood Pressure in Type 2 Patients

BY MIRIAM E. TUCKER
Senior Writer

COPENHAGEN — Self-treatment with a biofeedback device that guides breathing can significantly lower blood pressure among patients with type 2 diabetes, Dr. Moshe H. Schein reported at the annual meeting of the European Association for the Study of Diabetes.

The device, called RESPeRATE, is made by InterCure Ltd., Lod, Israel. It was approved for use by the Food and Drug Administration in 2002 for use in stress reduction and as adjunctive treatment for hypertension, together with other pharmacologic and nonpharmacologic interventions. It works by using melodic tones to guide the patient through progressively slower inhalation and exhalation.

Previous data have shown that the device-guided technique results in significant blood pressure reductions among hypertensive patients who use it at home on a daily basis (J. Hum. Hypertens. 2001;15:271-8).

In the new study, a total of 60 patients with type 2 diabetes who had blood pressures greater than 130/80 mm Hg were randomized to the use of the device for 15 minutes a day along with usual treatment, or to usual treatment alone for 8 weeks. The group was 60% male, with a mean age of 64 years and a mean body mass index of 30 kg/m^2.

At baseline, mean blood pressure was 149/82 mm Hg in the treatment group and 146/81 mm Hg in the control group, even though the majority—78% of the treatment group and 89% of the controls—were taking blood pressure medication, said Dr. Schein, director of the Family Medicine Unit, Hadassah University Hospital, Jerusalem.

Systolic blood pressure dropped by 9.5 mm Hg in the group using the device, compared with an increase of 2.1 mm Hg among the controls, a significant difference between the two groups. The change in pulse pressure also was significantly different at 2 months; it dropped by 5.9 mm Hg from a mean of 67 mm Hg at baseline in the guided-breathing group, and increased by 3.6 mm Hg from a mean of 66 mm Hg in the controls.

Diastolic blood pressure dropped slightly in both groups, by 3.5 mm Hg in the guided-breathing patients and by 1.5 mm Hg among the controls, an insignificant difference.

There was a dose-response relationship between use of the device and systolic blood pressure reduction: The longer the patient spent in the slow breathing exercise, the greater the drop. (Although patients had been told to perform the device-guided breathing exercise daily, they actually did it for a mean of 5.6 sessions per week. However, each session lasted 15.9 minutes, slightly longer than the instructed 15 minutes.)

Blood pressure control—defined as 130/80 mm Hg or below—was achieved by 8 of 30 (27%) in the device group, compared with just 2 of the 30 (7%) of the controls, Dr. Schein reported. ■

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The RESPeRATE device uses melodic tones to progressively slow the patient's breathing.