

Study Questions Sucrose's Role in Type 2 Diabetes

BY MAUREEN DONOHUE
Contributing Writer

A high-sucrose diet may not play as significant a role in the development of insulin sensitivity in healthy, nondiabetic subjects as previously thought, a study suggests.

These findings suggested that factors other than sucrose—including caloric overload, a sedentary lifestyle, and weight gain—may be more important than car-

bohydrate type in determining the eventual development of type 2 diabetes.

Investigators in the study, which was supported by an unrestricted research grant from the U.K. Sugar Bureau and Suikerstichting Nederland (the Dutch sugar foundation), randomized nearly identical eucaloric diets containing either 25% or 10% sucrose (as a percentage of total energy intake) in 13 healthy men with a mean body mass index (kg/m^2) of 26.6 and a mean age of 33 years. After 6 weeks on the diet, each

group completed a 4-week washout period and then switched to the other diet for another 6 weeks, so that the patients, in effect, provided their own controls.

Women were excluded from the study to prevent the effects of the menstrual cycle from affecting the end points of the study, reported R. Neil A. Black of the Regional Centre for Endocrinology and Diabetes, Royal Victoria Hospital, Belfast (Northern Ireland), and associates (*Diabetes* 2006;55:3566-72).

Insulin resistance was assessed using a two-step euglycemic clamp. Glycemic profiles were evaluated by a continuous glucose monitoring system, and vascular compliance was evaluated by pulse wave analysis.

Neither fasting hepatic glucose production nor suppression during low-dose insulin infusion was altered by dietary sucrose content, suggesting no abnormality of hepatic insulin action. There was also no difference in peripheral insulin resistance between the two dietary periods.

The results did indicate a trend toward an increase in insulin sensitivity with the high-sucrose diet, although this finding was not statistically significant and is likely the result of chance, the authors noted.

They also cautioned that the results of this study cannot be extrapolated to type 2 diabetes, and said that "further information regarding the impact of severe restriction of sucrose intake in low-carbohydrate weight-reduction diets is also needed." ■

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INCREASED ACTIVITY OF THE ENDOCANNABINOID SYSTEM (ECS) IS ASSOCIATED WITH INCREASED WAIST CIRCUMFERENCE^{1,2}

INCREASED WAIST CIRCUMFERENCE, A MARKER FOR IAA, IS AN ESTABLISHED CARDIOMETABOLIC RISK FACTOR³

- Significantly increases the risk of myocardial infarction, death from cardiovascular disease, and all-cause mortality⁴
- Has been found to be an independent predictor of type 2 diabetes⁵

ADIPOSE TISSUE IS A HIGHLY ACTIVE ENDOCRINE ORGAN⁶

- Fat cells (adipocytes) produce adiponectin⁶
 - In type 2 diabetes and obesity, adiponectin levels are reduced⁶

TARGETING THE ECS MAY PLAY A POTENTIAL ROLE IN THE CONTROL OF MAJOR CARDIOMETABOLIC RISK FACTORS SUCH AS IAA*

References

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Ghrelin Levels Associated With Insulin Resistance

Both elevated acylated ghrelin levels and elevated ratios of acylated to nonacylated ghrelin are associated with insulin resistance in overweight or obese postmenopausal women, reported Dr. David H. St-Pierre of the University of Montreal and his associates.

Ghrelin, a peptide derived mainly from the stomach, is an important factor in the regulation of food intake as well as in energy metabolism and storage. Acylated and nonacylated forms of ghrelin appear to induce different physiologic and metabolic effects, but their roles regarding insulin resistance and insulin sensitivity are not well understood, the investigators said (*J. Clin. Endocrin. Metab.* 2006 Oct. 24 [Epub doi:10.1210/jc.2006-1603]).

Dr. St-Pierre and his associates analyzed ghrelin levels in 89 nondiabetic postmenopausal women who were overweight or obese. They found that insulin-resistant subjects had significantly higher levels of acylated ghrelin and higher ratios of acylated to nonacylated ghrelin, compared with insulin-sensitive subjects, during a test using a euglycemic/hyperinsulinemic clamp.

The results suggest that insulin-resistant women modulate ghrelin in a different way than do insulin-sensitive women. "The sustained elevation of acylated ghrelin circulating levels combined with lower nonacylated ghrelin concentrations might contribute in part to the development of insulin resistance in overweight or obese postmenopausal women," the researchers said. "A ghrelin profile characterized by higher acylated/nonacylated ghrelin and decreased capacity of maximal reduction may be another indicator of insulin resistance in obese individuals."

—Mary Ann Moon