A closed-loop system linking continuous glucose measurements to insulin delivery reduced the risk of nocturnal hypoglycemia compared with standard continuous subcutaneous insulin infusion in a three-part, randomized, crossover study involving 17 children and adolescents with type 1 diabetes.

Previous studies have assessed the feasibility of closed-loop systems using various types of control algorithms, but this is the first to compare closed-loop delivery with traditional continuous subcutaneous insulin infusion (CSII) on two separate occasions. Seven of those 13 were (using Medtronic’s Guardian Real-Time) or standard overnight (8:00 p.m. to 8:00 a.m.) closed-loop delivery, 1 diabetes for a mean duration of 6.4 years. Thirteen to more complex applications providing 24-hour concentrations or overnight closed-loop delivery, proceeding such as shutting off the pump at low glucose concentrations.

In a secondary analysis pooling the data from the first and third evaluations, closed-loop delivery significantly increased the time for which plasma glucose was in the target range (60% vs. 40%) and significantly reduced the time in the hypoglycemic range (2.1% vs. 4.1%).

Major Finding: Compared to continuous insulin infusion, a closed-loop insulin delivery system increased the time plasma glucose was in the target range (60% vs. 40%) and significantly reduced the time in the hypoglycemic range (2.1% vs. 4.1%).

Data Source: A three-part randomized crossover study of 17 children and adolescents with type 1 diabetes.

Disclosures: Funding by the Juvenile Diabetes Research Foundation and three European research foundations. Dr. Hovorka has received lecture fees from Medtronic Medtronic, Abbott Diabetes Care, Lifescan, Novo-Nordisk, and B. Braun. He reported two patent applications. Dr. Renard stated he had no conflicts of interest.

Exercise Improves CV Risk Markers in Diabetes

BY MARY ANN MOON

A 4-month exercise program of moderate intensity improved the inflammatory milieu, markers of atherosclerosis, in overweight, sedentary diabetic patients.

The exercise did not alter body weight or insulin resistance, but it significantly improved glycemic, lipid, and cardiorespiratory factors, report ed Dr. Nikolas PE. Kadoglu of Hippokratios General Hospital of Thessaloniki (Greece) and his associates (Diabetes Metab. 2010 Feb. 9 [doi:10.1016/j.diabet.2009.11.004]).

They compared outcomes in 50 sedentary, overweight, white patients with type 2 diabetes who were aged 50-65 years and whose glycemic control had failed to improve after they had followed a diet and taken oral antidiabetic drugs for at least 4 months.

The participants were randomly assigned to an exercise program or a control group. Subjects were instructed to perform 30-60 minutes of brisk walking at least 4 days per week, with no more than 2 consecutive days of inactivity. They also were encouraged to increase daily activities by taking walking breaks during the work day, gardening, and doing household work. They were asked to meet with a personal trainer once a week for a 1-hour supervised session of aerobic activity.

A total of 87% of the patients in the exercise group said they achieved their target of 150 minutes per week of moderate-intensity exercise. After 4 months, the exercise group had significantly increased exercise capacity, reduced hemoglobin A1c levels, decreased BP and lower levels of total and LDL cholesterol, whereas the control group did not. But there was no improvement in either group in body mass index, waist-to-hip ratio, insulin resistance, and MMP-2 and TIMP-1 levels. Dr. Kadoglu and colleagues wrote.

Major Finding: Exercisers showed beneficial changes in MMP-9 levels and MMP7/TIMP ratios, compared with controls. Neither group improved in MMP-2 and TIMP-1 levels.

Data Source: Fifty overweight, sedentary type 2 diabetes patients randomized to exercise or no-exercise groups for 4 months.

Disclosures: The lead author reported receiving a grant from the Alexander S. Onassis Public Benefit Foundation. No other conflicts of interest were reported.

High Coffee Intake Cuts Diabetes Risk 67% in American Indians

BY SHARON WORCESTER

Drinking 12 or more cups of coffee daily was associated with a significant reduction in the incidence of type 2 diabetes over nearly 8 years, compared with consuming no coffee, according a study.

The study looked at the self-reported coffee intake of the 4,579-person Strong Heart Study, an investigation of cardiovascular disease in 13 American Indian tribes/communities. Participants in that study had baseline data collected during 1989-1992 and were followed for an average of 7.6 years.

Participants in the current analysis were the 1,141 men and women who had normal fasting glucose at baseline, wrote Dr. Ying Zhang of the Oklahoma University Health Sciences Center, Oklahoma City, and associates (Nutr. Metab. Cardiovasc. Dis. 2009; Feb. 18 2010 [doi:10.1016/j.numecd.2009.10.020]).

The 92 (8.1%) participants who report ed drinking at least 12 cups of coffee daily had a 67% lower risk (hazard ratio, 0.33) of developing type 2 diabetes during the follow-up period than did non-coffee drinkers, even after adjustment for age, gender, smoking, alcohol use, family history of diabetes, physical activity, and body mass index, the researchers noted.

In fact, coffee consumption was significantly related to diabetes risk only in those people who drank 12 or more cups daily.

A dozen cups of coffee or more per day yielded significant risk reduction.

The findings support those from several other studies showing a link between caffeine intake and diabetes development, but this is one of the few investigations that focused on a population known to have a high incidence of diabetes and on a group that, at baseline, had normal glucose tolerance.

The study was limited by a lack of available dietary data on the participants. It is plausible that high coffee consumption is a marker for dietary patterns and factors related to diabetes risk but not measured in this study, Dr. Zhang and associates noted.

The study was supported by grants from the National Heart, Lung, and Blood Institute, Bethesda, Md.