Skin Autofluorescence May Predict Mortality

**BY KATE JOHNSON**

COPENHAGEN — Skin autofluorescence is a strong and independent predictor of mortality in patients with well-controlled type 2 diabetes, according to data presented at the annual meeting of the European Association for the Study of Diabetes.

The study was headed by Dr. Andries Smit, head of the vascular unit of the University Medical Center in Groningen, the Netherlands, and medical director and founder of DiagOptics, which markets a skin autofluorescence (AF) measuring device called the AGE Reader.

Elevated levels of advanced glycation end products (AGEs) have been shown to predict cardiovascular complications better than blood sugar levels in patients with diabetes. Dr. Smit’s group previously showed that AGE levels can be measured in diabetic patients using skin AF (Diabetologia 2004;47:1324-30; Ann. N.Y. Acad. Sci. 2005;1043:290-8).

The current study involved 973 patients with type 2 diabetes (median duration 4.2 years) and well-controlled hemoglobin A1c ($HbA_1c$). Skin AF levels were measured with the AGE Reader at baseline and a median of 3.2 years later. A total of 86 patients died during the study, 44 from cardiovascular disease, said Dr. Helen Lutgers, of the diabetes outpatient clinic, Isala Clinics, Zwolle, the Netherlands, who presented the study at the meeting.

In a Cox regression analysis, smoking, the presence of peripheral vascular disease, and raised skin AF predicted mortality, with relative risks of 2.17, 2.15, and 1.69, respectively, she reported, but blood sugar, blood pressure, and lipid parameters were not predictive. “This is a superior measurement to HbA1c,” said Dr. Smit.

The AGE Reader measures skin AF noninvasively and can give results in 30 seconds, Dr. Smit said in an interview. “[It] gives incremental prognostic information in type 2 diabetes at a fraction of the burden and cost of [other] tools.”

The device is approved for marketing in Europe (at a cost of about €35,500). The company is waiting for Food and Drug Administration approval in the United States. U.S. physicians can order the equipment and use it as an investigational device, Dr. Smit said.

**By Kate Johnson**

Montréal Bureau

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Low-Carb Diet Trumps Caloric Restriction in Type 2 Diabetes

**BY JEFF EVANS**

Washington — Patients with type 2 diabetes may be able to improve glycemic control, weight loss, and cholesterol levels significantly more with low-carbohydrate diets than with diets emphasizing a caloric deficit, according to the results of two randomized trials presented at the annual scientific sessions of the American Diabetes Association.

Uncontrolled pilot studies of low-carbohydrate diets (ranging from 7% to 20% of total calories) in patients with type 2 diabetes have shown declines in $HbA_1c$ values ranging from 1.2 to 4.1 percentage points and decreases in weight of 7%-12% in up to a year of follow-up.

With such promising results in mind, Dr. Eric C. Westman and colleagues at Duke University, Durham, N.C., conducted a comparison of a low-glycemic index diet (LGI) with a low-carbohydrate, ketogenic diet (LCKD) in 97 type 2 diabetes patients, average age 59-51 years, who wanted to lose weight.

To be included in the trial, patients had to have no history of diabetes, obesity, or prediabetes, have an $HbA_1c$ of greater than 6% at screening, and be able to self-monitor blood glucose levels if on insulin or oral hypoglycemic therapy. Patients were excluded if they had unstable cardiovascular disease (allowable if hypertension and hyperlipidemia were under control), kidney disease, or liver disease, or were pregnant or breast-feeding.

Participants in each group received exercise recommendations and nutritional supplementation (a multivitamin, chromium 1,000 mcg/day, and vanadyl sulfate 60 mg/day) and attendance at exercise sessions.

The LCI diet consisted of an individualized 500-kcal reduction per day in energy intake, deriving 55% of energy from low-glycemic carbohydrates, whereas people on the LCKD restricted their carbohydrate intake to less than 20 g per day.

Among the 50 participants who completed the 24-week study $HbA_1c$ levels improved significantly more in the LCKD group (8.4% to 7.6%) than in the LGI group (8.3% to 8%).

In a multivariate regression model, treatment group was independently predictive of change in $HbA_1c$, after weight loss was controlled for suggesting that [the LCKD] diet, even beyond weight loss, had an effect on $HbA_1c$,” said Dr. Westman, professor in the department of medicine at Duke University.

The guidelines reflect a growing recognition within both fields of the common co-occurrence of diabetes and cardiovascular disease.

In a separate 2-year trial, an interim analysis of 6 months of data showed that a diet restricted to about 70 g of carbohydrates (half from fruit and milk) significantly improved weight and waist circumference in patients with type 2 diabetes, compared with a diet with a 500-kcal per day calorie restriction, reported Dr. Michael E. Daly, a diabetologist at the Royal Devon and Exeter NHS Trust, Exeter, England.

Six-month data were available for 206 of 259 (80%) patients randomized in the trial. This 20% dropout rate was lower than that of other low-carbohydrate studies, Dr. Daly said (N Engl J Med. 2001;345:2074-81; 2082-90). Participants had an average age of 59, a mean weight of 99 kg, and a mean BMI of 35 kg/m².

Significantly more weight loss occurred in carbohydrate-restricted patients (3.7 kg) than in those on the energy-deficit diet (1.2 kg). Both diets improved body fat percentage, $HbA_1c$, total cholesterol, HDL cholesterol ratio, triglycerides, and blood pressure, but no differences emerged between the two groups on any of these measures. In both groups, dietary calcium excretion declined to a similar extent and microalbumin excretion did not change substantially (Diabet. Med. 2006;23:15-20).