Diabetes Education May Cut ED Return Visits

BY MIRIAM E. TUCKER

FROM THE ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF DIABETES EDUCATORS

SAN ANTONIO – An emergency department intervention delivered by a certified diabetes educator to patients who presented with uncontrolled hyperglycemia reduced the number of repeat visits and improved glycemic control at 6 months without increasing the risk of hypoglycemia.

VITALS

Major Finding: After the emergency department intervention, mean blood glucose levels dropped by 174 mg/dL, HbA_{1c} went down by at least 0.4 percentage points, and visits to the ED for hypo- or hyperglycemia were reduced by 78%.

Data Source: A pilot study of 86 patients presenting to an ED with uncontrolled hyperglycemia.

Disclosures: The study was funded by the Washington Department of Health. Bayer Pharmaceuticals contributed the A1cNow testing kits and blood glucose meters. Sanofi-Aventis and Novo Nordisk provided insulin pens. Dr. Magee disclosed that she receives support for investigator-initiated grants from Sanofi-Aventis and honoraria for speaking for Sanofi-Aventis and Novo Nordisk. Ms. Nassar stated that she has no disclosures.

Use of emergency departments (EDs) for treatment of chronic conditions is a problem both nationally and in the District of Columbia where, in 2006, there were 39,857 ED visits by individuals with diabetes at a cost of about $27 million. A 2008 Rand report estimated that a significant portion of these visits could have been prevented with prior primary care visits and appropriate self-management education, said Dr. Michelle F. Magee, an endocrinologist at Medstar Health Research Institute, Washington Hospital Center.

The Stop Emergency Department Visits for Hypoglycemia Project-DC (Step DC) pilot study – which was initiated in response to a request by ED personnel – enrolled adults who presented to the ED with blood glucose levels of 200 mg/dL or above, whether or not they had a previous diagnosis of type 2 diabetes. (Those with type 1 were excluded.) They had to be stable for discharge once their hyperglycemia was treated, with no other acute comorbidities.

Carine M. Nassar, a certified diabetes educator (CDE) and registered dietician, described the four-visit intervention, comprising three components: using a medication algorithm to achieve glycemic control, focusing on diabetes self-management education "survival skills," and teaching patients health system navigation skills to find a primary care medical home to reduce future use of the ED for ongoing diabetes care.

The first visit took place while the patient was in the ED. It included point of care hemoglobin A_{1c} and glucose testing, a knowledge questionnaire, and hydration plus insulin therapy. Survival skills education was taught both to those who were newly diagnosed and those who already had been diagnosed with diabetes, many of whom nonetheless lacked basic knowledge of the condition, noted Ms. Nassar, program manager at Medstar Diabetes Institute at Washington Hospital Center.

Patients were discharged with a glucose meter and a prescription for antihyperglycemic medications, based on the treatment algorithm. In general, metformin and/or sulfonylureas were used if blood glucose levels were 200-250 mg/dL, either drug or basal insulin was used for glucose levels of 251-300 mg/dL, and metformin plus insulin – either basal or NPH – was used in patients with glucose levels above 300 mg/dL. Patients who needed insulin were taught to self-administer injections before leaving the ED.

Subsequent outpatient visits took place at 24-72 hours, 2 weeks, and 4 weeks after discharge. These involved a review of blood glucose data with medication adjustments as necessary, continued education, and help with navigation to outpatient clinics or private primary care settings, depending on whether the patient had insurance and what it covered. (Only 15% were uninsured.)

The final visit at week 4 could take place over the phone if the patient so chose and was used to go over any final information, assess glucose data, and ensure that the patient had a follow-up visit in a primary care setting.

The 86 patients had a mean age of 62, 52% were male, and 93% were black. Nearly half (48%) were employed full time; 22% were unemployed. Just over a third (36%) had completed high school or an equivalent. Nearly three-quarters (71%) had never received diabetes self-management education, and 12% received it more than 3 years before the ED visit. "There was a huge knowledge deficit," said Dr. Magee, who is also with Georgetown University, Washington.

The top three reasons for the ED visit were the inability to get an appointment with a primary care provider, cited by 42%; no primary care provider, 14.5%; and having been sent to the ED by their primary care provider, 10%. "Fully 66.6% came to the ED due to unavailability of primary care that day," Dr. Magee said.

The mean blood glucose level at study entry was 356 mg/dL, with one patient having a level of 923 mg/dL that was treated with an insulin drip. The mean baseline HbA_{1c} was 12%. However, that is probably an underestimate because the A1cNow point of care device used in the study has an upper limit of 13% and half of the patients had an HbA_{1c} of greater than 13%, she said.

A total of 60% of the patients completed all four visits, 21% completed two or three, and 19% did not return for any visits after the initial one in the ED. Nearly half (48%) had seen a primary care physician or were scheduled to see one as a result of the intervention.

Among the 60 patients who completed at least three visits, there were no instances of hypoglycemia (blood glucose level of 60 mg/dL or below) on day 1, and the overall hypoglycemia rate was just 1.33% of total patient-days, representing a total of 26 hypoglycemic events over 1,956 patient days. There were no episodes of severe hypoglycemia, defined as a glucose level of 40 mg/dL or less or any event requiring assistance to treat, Dr. Magee reported.

Mean blood glucose level fell by 173 mg/dL, to 183 mg/dL from the baseline 356 mg/dL. Mean HbA_{1c} fell by 0.4 percentage points, to 11.6%. However, again, this is likely an underestimate, she noted.

Visits to the ED for hypo- or hyperglycemia were cut by 78%, from 42 in the 6 months prior to the intervention to just 9 in the subsequent 6 months. This was a strong trend, but the sample size was too small to reach statistical significance.

On average, the CDE spent about 6 hours per patient to complete all the visits, and the supervising physician spent about 30 minutes total. The average cost of staff time per patient was about $350, compared with an average $678 for an ED visit for uncontrolled blood sugar. ■

Metabolic Syndrome Can Raise CVD Risk Without Diabetes

BY HEIDI SPLETE

FROM THE JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

The constellation of risk factors known as the metabolic syndrome was associated with a 1.5-fold increase in all-cause mortality and a 2-fold increase in cardiovascular outcomes, in a meta-analysis of 87 studies in 951,083 patients.

Salvatore Mottillo of the Jewish General Hospital and McGill University, Montreal, and his colleagues reviewed data from 87 prospective, observational studies of cardiovascular risk and metabolic syndrome based on either the National Cholesterol Education Program (NCEP) definition of three or more of five cardiovascular risk factors, or the revised NCEP (rNCEP) issued in 2004.

The five factors in the NCEP definition are waist circumference (greater than 88 cm for women, greater than 102 cm for men), triglycerides (150 mg/dL or higher for men and women), systemic hypertension (130/85 mm Hg or higher), HDL cholesterol level (less than 50 mg/dL for women, less than 40 for men), and fasting glucose of 110 mg/dL or higher. The revised version dropped the fasting glucose to 100 mg/dL or higher and modified the central obesity measurements to be greater than or equal to 102 cm for men and greater than or equal to 88 cm for women.

Some of the studies involved more than one cardiovascular risk factor and more than one definition of metabolic syndrome.

Overall, metabolic syndrome was associated with an increase in all-cause mortality, with a relative risk of 1.54 based on the NCEP definition and 1.63 based on the rNCEP definition. In a pooled analysis, the risk of cardiovascular disease (CVD) mortality approximately doubled (relative risk, 2.40), as did the risk for CVD (RR, 2.35), stroke (RR, 2.27), and MI (1.99).

Metabolic syndrome remained significantly associated with an increased risk of CVD mortality in patients without type 2 diabetes. The relative risks of cardiovascular outcomes in individuals without type 2 diabetes were 1.62 for MI, 1.75 for CVD mortality, and 1.86 for stroke (J. Am. Coll. Cardiol. 2010;56:1113-32).

The metabolic syndrome does not require type 2 diabetes in its definition "to be closely associated with cardiovascular risk," the researchers wrote.

The results were limited by the use of observational studies and the variation in follow-up times. However, in a sensitivity analysis, the risk for CVD mortality associated with metabolic syndrome was similar in studies with follow-up times both longer and shorter than the median time.

VITALS

Major Finding: The relative risks of cardiovascular outcomes in individuals without type 2 diabetes were 1.62 for MI, 1.75 for CVD mortality, and 1.86 for stroke.

Data Source: A meta-analysis of 87 studies involving 951,083 adults.

Disclosures: Mr. Mottillo was supported by a Canadian Institutes of Health Research grant in cardiovascular outcomes research. Study coauthor Dr. Jacques Genest is on the speakers bureau for AstraZeneca and Merck.

Prospective studies of cardiovascular risk associated with metabolic syndrome itself, rather than the different components, are needed, "to establish whether or not the metabolic syndrome adds any prognostic significance," the researchers said. Meanwhile, "we recommend that health care workers use the metabolic syndrome to identify patients who are at particularly high risk for cardiovascular complications," they said. ■