Hyperglycemia Topped List of Type 2 Predictors

BY MIRIAM E. TUCKER

FROM THE ANNUAL MEETING OF THE EUROPEAN ASSOCIATION FOR THE STUDY OF DIABETES

STOCKHOLM – The risk for developing type 2 diabetes is not the same for everyone with metabolic syndrome, but instead varies dramatically depending on individual factors.

In fact, hyperglycemia – with or without metabolic syndrome – was a much stronger predictor of incident type 2 diabetes than was metabolic syndrome without hyperglycemia in a 5-year observational analysis of 58,056 initially nondiabetic adults aged 30 years and older who were members of the managed care organization Kaiser Permanente Northwest, Gregory A. Nichols, Ph.D., said.

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Major Finding: The combination of impaired fasting glucose and any one additional component of metabolic syndrome was associated with a higher incidence rate of diabetes (16.5/1,000 person-years) than did any three- or four-component combination that did not include IFG (7.9 and 11.3 per 1,000 person-years, respectively) yet did meet the metabolic syndrome criteria.

Data Source: Five-year observational analysis of 58,056 initially nondiabetic adults aged 30 years and older who were members of the managed care organization Kaiser Permanente Northwest.

Disclosures: This study was funded by Tethys Bioscience Inc., where Dr. Moler is an employee. Dr. Nichols disclosed that he has also received research funding from GlaxoSmithKline, Novartis, Novo Nordisk, Takeda Pharmaceuticals, and Merck & Co.

"In the absence of impaired fasting glucose, the definition of metabolic syndrome may be a misleading estimator of diabetes risk," according to Dr. Nichols, who was the lead investigator on the study (Diabetes Res. Clin. Pract. 2010;90:115-21).

He and a colleague examined the incidence of diabetes for all possible combinations of metabolic syndrome components using criteria defined in the National Cholesterol Education Program's Adult Treatment Panel III report (ATP III) (Circulation 2004;109:433-8).

The one exception was the use of body mass index as a substitute for waist circumference, which is rarely measured clinically, explained Dr. Nichols of Kaiser Permanente's Center for Health Research, Portland, Ore.

For the study, an individual was considered to have metabolic syndrome if they met three of the following five criteria:

► Impaired fasting glucose (greater than 100 mg/dL),

► Hypertension (130/85 mm Hg or greater),

► High triglycerides (150 mg/dL or greater),

► Low HDL cholesterol (less than 40 mg/dL for men, 50 mg/dL for women), and

► Body mass index greater than 28.8 kg/m^2. This BMI cut-point has been substituted for waist circumference in other published studies, he noted.

Over 5 years, 6% of the total study sample developed diabetes. Compared with those who did not develop diabetes, those who did were significantly older (59 vs. 57 years), and were more likely to be male (52% vs. 44%), non-white (10% vs. 8%) and a current smoker (15% vs. 12%).

Not surprisingly, the risk for developing diabetes was greater in the presence than in the absence of each individual component. The 5-year risk for diabetes rose with each component an individual had at baseline, from 0.3% for those with none to 1.2% with one, 3.5% with two, 8.4% with three, 16.9% with four, and 28.2% with five.

However, the risk for diabetes varied dramatically among the five individual components. The greatest risk was associated with impaired fasting glucose (IFG), with an incidence of 37.4/1,000 person-years.

Low HDL cholesterol was next (21.6/1,000 person-years), followed by high triglycerides (20.6/1,000), obesity (19.5), and hypertension (16.2).

There was a clear separation between combinations of components that did and did not contain IFG. The combination of IFG and any one additional component – by definition, not meeting metabolic syndrome criteria – had a higher incidence rate of diabetes (16.5/1,000 person-years) than did any three- or four-component combination that did not include IFG (7.9 and 11.3 per 1,000 person-years, respectively), yet did meet the metabolic syndrome criteria.

The incidence of diabetes among those who had IFG and no other metabolic syndrome component was 10.2/1,000 person-years, just slightly less than the incidence for those with every component except IFG (11.3/1,000), Dr. Nichols reported.

"Better prediction tools that identify truly high-risk individuals would enhance diabetes prevention strategies," he concluded at the meeting.

In the published article, Dr. Nichols and his coauthor Dr. Edward J. Moler noted that in addition to the association with diabetes, the clustering of risk factors that comprise metabolic syndrome also are precursors to cardiovascular disease (CVD), and that the relationship of individual components to CVD is unclear.

"Because metabolic syndrome is also used to predict CVD risk, future research should assess the relative importance of metabolic syndrome components to predict incident CVD," they said. ■

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