Glucose Levels, Not Diabetes, Predict Post-MI Mortality

BY DENISE NAPOLI

Average glucose levels at hospital admission for acute myocardial infarction predict 30-day mortality better than does diabetes history, even though the latter is routinely used as an assessment tool, according to an analysis of two large trials.

"Patients with no diabetes history with elevated in-hospital glucose levels have the same high risk for short-term death after AMI as patients with diabetes history," the investigators wrote.

Dr. Abhinav Goya of the Emory Schools of Public Health and Medicine in Atlanta, along with an international team of investigators, conducted a post hoc analysis of two randomized, controlled trials of AMI with ST-segment elevation: the Clinical Trial of Reviparin and Metabolic Modulation in Acute Myocardial Infarction Treatment and Evaluation–Estudios Clinicos Latino America (CREATE-ECLA), and the Organization for the Assessment of Strategies for Ischemic Syndromes–6 (OASIS-6). For the analysis, the investigators looked at glucose measurements taken at hospital admission, at 6 hours post admission, and at 24 hours post admission, and took as "average in-hospital glucose" the mean of the three. They also assessed diabetes history, and then estimated the ability of these to forecast death at 30 days.

A total of 30,536 patients were analyzed. Of them, 13,100 (43%) had an average glucose of at least 144 mg/dL, the cutoff point that was used to predict risk of 30-day mortality. Of these 13,100 patients, 8,388 (64%) did not have a history of diabetes.

At 30 days, 2,808 patients had died. Average glucose predicted mortality with a highly significant odds ratio of 1.10, and this remained undiminished after adjustment for diabetes history, according to Dr. Goya, also of the Population Health Research Institute, Hamilton, Ont.

Diabetes history alone also predicted death at 30 days, with a highly significant odds ratio of 1.63; however, after adjustment for average glucose, the odds ratio fell to a nonsignificant 0.98.

Additionally, nondiabetic patients with glucose levels above 144 mg/dL had an average rate of death that nearly matched that of diabetic patients with similarly high glucose—13.2% versus 13.7%, respectively (Am. Heart J. 2009 Feb. 23 [doi:10.1016/j.ahj.2008.12.007]).

"These hyperglycemic patients with no diabetes history would have been overlooked as high risk if diabetic status alone were used for risk assessment," the authors concluded.

"The use of in-hospital glucose levels in addition to diabetes history greatly enhances the identification of high-risk patients," and because it is measured routinely throughout the AMI hospitalization, "elevated glucose levels should be integrated along with diabetes history into the risk stratification of AMI patients," the authors wrote.

The CREATE-ECLA trial had no external funding; OASIS-6 was funded by Sanofi Aventis, Organon, and GlaxoSmithKline. ■

Many Elective Angiographies Are Deemed Unnecessary

BY BRUCE JANCIN

NEW ORLEANS — Nearly two-thirds of 400,000 patients who underwent elective diagnostic coronary angiography recently at 601 U.S. hospitals turned out not to have obstructive coronary artery disease.

This is not an efficient use of health care resources, and a clear factor in this poor performance is the low positive predictive value of current noninvasive stress testing methods for myocardial ischemia, Dr. Manesh R. Patel said at the annual scientific sessions of the American Heart Association.

Clinical practice guidelines recommend documenting ischemia through noninvasive stress testing before considering diagnostic coronary angiography. That was done in 84% of the cases in this series, taken from the American College of Cardiology National Cardiovascular Data Registry. However, the positive predictive value of noninvasive testing was just 41%, said Dr. Patel of Duke University, Durham, N.C. "There appear to be opportunities to improve the efficiency of diagnostic strategies in contemporary practice," he said.

He reported on 397,954 stable patients without a history of acute coronary syndrome or coronary revascularization who underwent diagnostic coronary angiography during 2004-2008 and were entered into the comprehensive national registry.

Obstructive coronary artery disease (CAD) was detected in 37.5% of patients based on at least a 50% stenosis of the left main artery or a 70% or greater stenosis of other major vessels.

Of the patients with obstructive CAD, 14% had a low Framingham risk score, 59% were at moderate Framingham risk, and 27% were at high risk. Among those patients found not to have significant CAD, 39% had a low Framingham risk score, 52% had a moderate risk score, and the rest had a high Framingham score.

Among the 69% of subjects who were referred for angiography following a positive stress test, 41% proved to have obstructive CAD. Of the 12% of patients who were sent for diagnostic angiography after a negative stress test, 28% were found to have obstructive CAD.

A total of 16% of patients in this large series were referred for diagnostic angiography without a prior stress test, presumably because something in their clinical evaluation caused their physician to believe they had a high likelihood of significant CAD. Yet upon angiography, only 35% of this group proved to have obstructive CAD.

Thus, neither Framingham risk score nor stress test results were very useful as a guide to who ought to have diagnostic angiography. Nor were patient symptoms. For example, 44% of patients found to have obstructive CAD had stable angina, but so did 27% of those who did not. Atypical chest pain, reported by 37% of patients, was present in 25% of those found to have obstructive CAD and in 44% who did not.

Complications of diagnostic angiography occurred in 1.6% of cases. ■

Off-Pump CABG Increased Stay and Costs, But Not Survival

BY SHERRY BOSCHERT

SAN FRANCISCO — Off-pump coronary artery bypass grafting was associated with greater costs and length of hospitalization and no difference in the risks of death or stroke, compared with conventional on-pump procedures in a review of 63,061 cases.

The findings are sure to fuel the controversy over which type of coronary artery bypass grafting (CABG) is better—the conventional on-pump (using cardiopulmonary bypass) approach or the more recent off-pump CABG. Some previous studies have shown improved outcomes with off-pump CABG, whereas others have shown worse outcomes.

In the current study, 14,392 patients who underwent CABG without cardiopulmonary bypass pumps averaged 10.2 days in the hospital, compared with 9.9 days in 48,669 patients who had on-pump CABG, a statistically significant difference. After a multivariable logistic regression analysis, off-pump CABG was associated with an extra 0.6 days in the hospital and $1,497 in higher costs, Dr. Danny Chu and his associates reported at the annual meeting of the Society of Thoracic Surgeons.

In-hospital death rates—the primary outcome in the analysis—were about 3% in each group. The incidence of postoperative stroke was about 2% in each group. These rates did not differ significantly between groups.

'Off-pump coronary artery bypass should be an alternative to, not a replacement for, the traditional on-pump CABG.'

DR. CHU

"Off-pump coronary artery bypass should be an alternative to, not a replacement for, the traditional on-pump CABG," said Dr. Chu of Baylor College of Medicine, Houston. "We do not believe that performing off-pump CABG on all patients is justifiable."

Dr. Chu and his associates had no potential conflicts of interest.

The study analyzed data on all U.S. patients undergoing isolated CABG and no concomitant cardiac operations in 2004, using records from the nonvoluntary Nationwide Inpatient Sample (NIS) database maintained by the Agency for Healthcare Research and Quality.

Several preoperative characteristics differed significantly between groups. The off-pump patients averaged a year younger in age than on-pump patients (65 vs. 66 years) and were more likely to be female (31% vs. 29%) and to be emergency cases (29% vs. 25%).

The analysis stratified patients for risk using the Deyo Comorbidity Index, a modification of the validated Charlson Comorbidity Index.

Commenting on the study after Dr. Chu's presentation, Dr. John D. Puskas criticized the investigators' use of an administrative database like the NIS for the purpose of clinical outcomes analysis. The study's conclusions "cannot be justified," said Dr. Puskas, chief of cardiac surgery at Emory Crawford Long Hospital, Atlanta.

Dr. Puskas is a consultant to, and has received research funds from, Medtronic Inc. and Marquet Medical Systems, which make devices used in CABG (both on- and off-pump). He also has received royalties from coronary instruments marketed by Scanlan International Inc.

Dr. Puskas also was the primary investigator in a review of records on 42,477 consecutive, nonemergency, isolated CABG surgeries, using data from the Society of Thoracic Surgeons National Cardiac Adult Database. His study concluded that off-pump CABG was associated with a 17% lower risk of death, a 35% lower risk of stroke, a 33% lower risk of MI, and a 29% lower risk of major adverse cardiac events compared with on-pump CABG, all significant differences (Ann. Thorac. Surg. 2007;84:1447-56).

"These are very tight data, and they are compelling. This is the most sophisticated and complete risk-adjusted assessment possible, with a very vigorous database," he said.

A separate recent analysis of the NIS database that analyzed CABG outcomes based on patients' differing coronary anatomy found lower risks for death, MI, stroke, or major adverse cardiac events with off-pump CABG than with on-pump, he added. ■