

# Glycemic Control Tied to Coronary Calcification

BY PATRICE WENDLING  
Chicago Bureau

MONTREAL — Suboptimal glycemic control, elevated plasma osteoprotegerin, and presence of serum interleukin-6 were risk factors for progression of coronary artery calcification in a prospective study of asymptomatic patients with type 2 diabetes.

Despite having no known coronary artery disease, a significant proportion (30%) of the 398 patients followed in the study had atherosclerosis progression, Dr. Avijit Lahiri said at the annual meeting of the American Society of Nuclear Cardiology.

The study provides insight into the risk factors for progression of coronary calcification and establishes the role of combining cardiac CT for coronary artery calcium (CAC) imaging with simultaneous single-photon emission computed tomography (SPECT) myocardial perfusion imaging (MPI) in uncomplicated, stable, asymptomatic patients with type 2 diabetes, Dr. Lahiri said.

CAC can be used to identify patients with increased atherosclerotic burden, but it does not identify obstructive coronary artery disease, explained Dr. Lahiri, director of cardiac imaging and research at Wellington Hospital in London. There-

fore, there is a need to use combined MPI to detect silent ischemia. "Interestingly, these tests had a synergistic value on prognosis," he said in an interview. "Thus, it would be cost effective to exclude those without CAC for further testing."

The original study included 510 patients, of whom 20 went on to have cardiac events, and 402 were willing to participate in the current follow-up study. Four scans were technically inadequate, resulting in a cohort of 398 patients. Their mean age was 53 years; 61% were male; and their average serum glycosylated hemoglobin (HbA<sub>1c</sub>) was 8%.

All patients underwent CAC imaging, as well as a clinical evaluation—at baseline and about 2.5 years later—that measured HbA<sub>1c</sub>, serum interleukin-6 and C-reactive protein; and plasma osteoprotegerin. Those with a CAC score of more than 100 Agatston units at baseline also underwent MPI using a 2-day stress-rest protocol with technetium-99m sestamibi and dipyridamole and maximum treadmill exercise. Progression/regression of coronary calcification was defined as a change in the square root-transformed volumetric CAC score of 2.5 mm<sup>3</sup> or more.

At baseline, 211 (53%) of the 398 patients had coronary artery calcification. At follow-up, atherosclerosis progression was observed in 118 (30%) patients, including

22 (5.5%) who had no calcification at baseline, Dr. Lahiri said. Regression was noted in 3 (0.8%), and there was no change in 277 (70%).

At baseline, 24 patients had an abnormal perfusion scan. Progression of ischemia



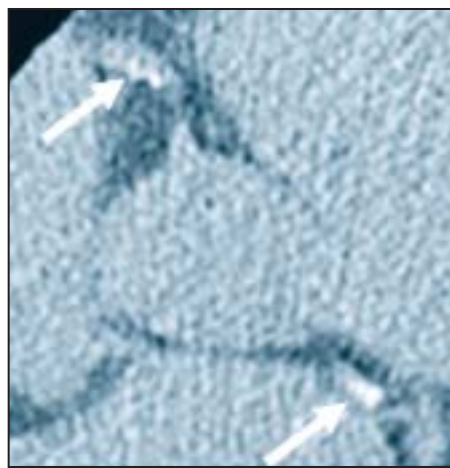
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DR. LAHIRI

was seen in 14 patients, regression in 8, and no change in 2.

In a univariate analysis, age, male gender, presence of hypertension, and baseline HbA<sub>1c</sub> were predictors of atherosclerosis progression. There was no significant association between calcium scores and serum levels of C-reactive protein or IL-6. Surprisingly, statin use was a negative predictor, Dr. Lahiri said.

In a multivariate logistic regression model, serum HbA<sub>1c</sub> was one of the most important factors influencing progression. Poor glycemic control raised the risk of progression 10.5-fold, whereas the risk increased 2.5-fold for elevated plasma osteoprotegerin and 2.1-fold for IL-6. ■



PHOTOS COURTESY DR. AVIJIT LAHIRI

SPECT images show progression of atherosclerosis in the right coronary and left circumflex arteries (arrows) of a patient with diabetes over a period of 1.7 years.

## Even Mild Renal Impairment Increases Event Risks in Cardiac Disease Patients

BY MITCHEL L. ZOLER  
Philadelphia Bureau

BARCELONA — Mild renal impairment can have a substantial effect on the rate of death or myocardial infarction in patients with coronary artery disease, according to a review of more than 5,000 patients.

"Renal insufficiency is usually defined as a glomerular filtration rate [GFR] of less than 60 mL/min per 1.73 m<sup>2</sup>, but these results show that patients with mild renal impairment [defined as a GFR of 61-80 mL/min per 1.73 m<sup>2</sup>] have an increased risk of death, cardiac death, or myocardial infarction," Ron T. van Domburg, Ph.D., and his associates said in a poster presented at a joint meeting of the European Society of Cardiology and the World Heart Federation.

"Many physicians only care about renal function if a patient's serum creatinine is more than 2 mg/dL. For non-nephrologists it's a new concept that mild renal dysfunction" can have a significant effect on outcomes, said Dr. Don Poldermans, a professor in the department of anesthesiology at Erasmus University Medical Center in Rotterdam, the Netherlands, and a coauthor of the poster.

The study reviewed 5,041 patients who were seen at Erasmus Medical Center with known or suspected coronary artery disease during 1993-2004. None of these patients was on dialysis.

Their follow-up ranged from 6 months to 12 years with an average of 6 years.

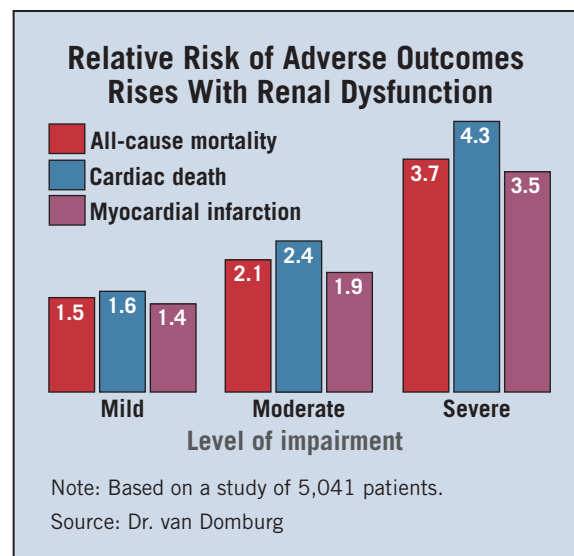
Renal function was normal (GFR greater than 80) in 41%, mildly impaired in 28%, moderately impaired (GFR 41-60) in 19%, and severely impaired (GFR 40) in 12%.

The researchers then determined the rate of all-

cause death, cardiac death, and nonfatal MI in each subgroup, and calculated the risk for each end point faced by each group relative to patients with normal renal function and adjusted for baseline demographic and clinical differences.

The results showed a substantial and statistically significant increased risk for all three adverse outcomes that tracked with the extent of renal impairment (see box), reported Dr. van Domburg, a researcher in the Thoraxcenter at Erasmus Medical Center.

The implication is that all patients with known or suspected coronary artery disease and any degree of impaired renal function should undergo close surveillance and intensive medical therapy, including treatment with a statin, an ACE inhibitor, and a  $\beta$ -blocker, the authors of the poster concluded. ■



## Diabetes Diminishes Lung Power in Cardiac Rehab

CHARLESTON, W.VA. — Ischemic heart disease patients with comorbid diabetes start cardiac rehabilitation programs at a disadvantage: They have less lung power than nondiabetic heart disease patients do, according to a poster presented at the annual meeting of the American Association of Cardiovascular and Pulmonary Rehabilitation.

To identify possible deficits in oxygen consumption among diabetic heart disease patients, Bradley Chapman, an exercise physiologist at the University of Toledo, Ohio, and his colleagues measured peak oxygen consumption in 76 diabetic and 114 nondiabetic adults at the start of a standard cardiac rehabilitation program.

The researchers assessed the patients using a motorized treadmill and determined peak oxygen consumption (VO<sub>2</sub>) by using the highest recorded measurement based on an average of every 5-7 breaths. The diabetic and nondiabetic groups were matched for age and weight, and the heart disease diagnoses were not significantly different between the two groups.

The mean peak VO<sub>2</sub> of the diabetic patients was found to be 17.2 mL/kg per minute, compared with 20.2 mL/kg per minute for the nondiabetic patients, a significant difference.

Previous studies have shown that exercise training should be encouraged in cardiac patients with diabetes because it not only improves aerobic capacity but also promotes better diabetes management, the researchers wrote. The findings that the diabetic patients had a lower oxygen capacity suggest that exercise training could have an even greater clinical benefit for diabetic coronary patients than it does for nondiabetic patients, they said.

The researchers did not reassess the patients at the end of the rehabilitation program. But the study supports previous findings that peak oxygen consumption tends to be lower in diabetic heart disease patients than in nondiabetic patients.

—Heidi Splette