HeartWATCH

WINTER 2007

A Newsletter Produced by the Texas Heart Institute

Texas Heart® Institute

at St. Luke's Episcopal Hospital

Preoperative Statin Therapy Is Associated With Reduced Mortality After Coronary Artery Bypass Graft Surgery

Abstract: Perioperative statin therapy in coronary artery bypass surgery patients reduces in-hospital cardiac mortality; discontinuing statins postoperatively may increase the risk of in-hospital mortality.

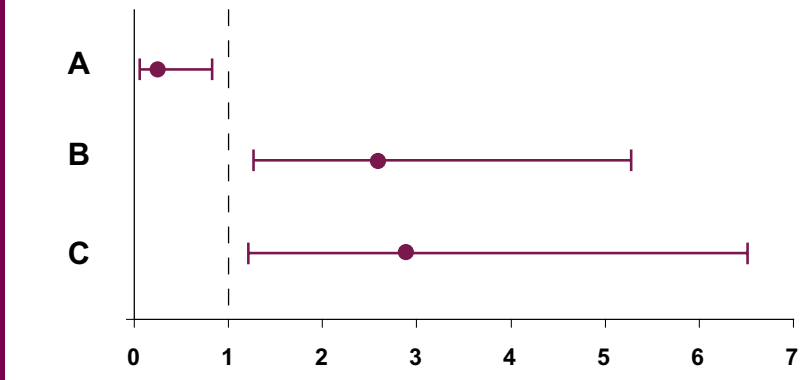
Statins offer safe, effective, and beneficial therapy for patients who have high cholesterol levels and cardiovascular disease. Multiple studies have confirmed that statins have salutary anticholesterolemic, antiatherosclerotic, antithrombotic, and antiinflammatory effects and can prevent adverse cardiovascular events in these patients. Both the American Heart Association (AHA) and American College of Cardiology (ACC) now recommend the use of statins. So far, however, this recommendation has mainly been based on studies of preventive statin use in ambulatory patients before surgery is ever needed.

Some researchers, however, including Charles D. Collard, MD, a cardiovascular anesthesiologist at the Texas Heart Institute at St. Luke's Episcopal Hospital (THI at SLEH), have been turning their attention to the perioperative effects of statin use.

"Here at THI, we've been researching this issue for some time," says Dr. Collard. "Two years ago, an inhouse research team mined THI's surgical database for information on more than 1600 patients who underwent coronary artery bypass graft (CABG) surgery. We discovered that for patients who had been receiving statins before surgery, early mortality was reduced almost by half [see *Heart Watch*, Fall 2004, texasheart.org]."

More recently, as part of a larger, multinational group of investigators, Dr. Collard analyzed in-hospital cardiac mortality in a subset of patients in the Multicenter Study of Perioperative Ischemia (McSPI) Epidemiology II, a prospective, long-term study of more than 5400 patients undergoing CABG surgery (*J Thorac Cardiovasc Surg* 2006;132:392–400). The subset included patients who had received statins preoperatively (n=1352) and patients who had not (n=1314).

As lead author of the published substudy report, Dr. Collard described 2 important findings. First, preoperative statin administration independently reduced the risk of early cardiac death in the first 3 days after CABG surgery (adjusted odds ratio [OR] 0.25; confidence interval [CI] 0.07–0.87; mortality 0.3% vs. 1.4%; $P<0.03$). Second, in patients who received preoperative statin therapy, postoperative discontinuation of statins increased the risk of both all-cause mortality (adjusted OR 2.64; 95% CI 1.32–5.26; mortality 2.64% vs. 0.60%; $P<0.01$) and cardiac mortality (adjusted OR 2.95; 95% CI 1.31–6.66; mortality 1.91% vs. 0.45%, $P<0.01$) between postoperative day 4 and hospital discharge.



Adjusted odds ratios and 95% confidence intervals for (**A**) early cardiac mortality associated with preoperative statin use and (**B**) late all-cause and (**C**) late cardiac in-hospital mortality associated with postoperative statin discontinuation in preoperative statin recipients. Values to the left or right of the dotted vertical line indicate a decrease or increase in mortality risk, respectively.

The implications, says Dr. Collard, are clear: "Physicians need to know that statin administration should be continued throughout the postoperative period, because discontinuing statins after surgery increases the risk of in-hospital mortality."

"Although the AHA and ACC guidelines recommend statins for postoperative CABG patients with LDL cholesterol concentrations of >100 mg/dL, two thirds of eligible candidates may not be receiving statin therapy at discharge," says Collard. "This may be because nausea and vomiting make these patients less tolerant of oral medications; transient postoperative kidney dysfunction, concerns about liver toxicity, or muscle soreness preclude statin use; or the responsible physician simply does not restart preoperative medications. Therefore, physicians should be educated about the potential benefits of continuing statin therapy throughout the perioperative period."

How long must patients use statins preoperatively for a beneficial effect on postoperative outcome? There is evidence that statins begin to exert antiinflammatory and endothelial effects within 6–16 weeks after initiation (*Circulation* 2002;105:691–6; *JAMA* 2001;286:64–70; *Circulation* 2003;108:1560–6; *Circulation* 2003;108:839–43).

"In any case," says Dr. Collard, "the McSPI substudy strongly suggests that preoperative statin therapy reduces early cardiac mortality after CABG surgery and that statins should be continued throughout the postoperative period as part of the post-CABG recovery regimen." ●

For more information:

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Cerebral Oxygenation During Hypothermic Cardiopulmonary Bypass: Influence of α-stat vs pH-stat Blood Gas Management

Abstract: In selected cardiac surgery patients, pH-stat blood gas management during hypothermia and the initial period of rewarming may optimize cerebral oxygenation.

Patients undergoing cardiac operations requiring cardiopulmonary bypass (CPB) may develop low (<30 mm Hg) jugular-bulb oxygen tension ($PjvO_2$) during hypothermia, followed by jugular venous desaturation (JVD) (saturation level <50%) during rewarming at the end of CPB. In this setting, JVD may lead to postoperative cognitive deficits.

Researchers in the Department of Cardiovascular Anesthesiology at the Texas Heart Institute at St. Luke's Episcopal Hospital (THI at SLEH) believe that the risk of JVD is influenced by which blood gas management strategy is used during CPB: a temperature-uncorrected method (α-stat) or a temperature-corrected one (pH-stat). According to John R. Cooper, MD, interim chief of the Department, a major difference between these strategies is that pH-stat entails approximately a 50% increase in arterial carbon dioxide ($PaCO_2$), with consequently greater cerebral blood flow. In animal models, this produces more homogeneous cooling and better cerebral perfusion during hypothermia. In turn, the improved perfusion leads to reduced oxygen consumption, better cerebral tissue oxygenation, less derangement of cerebral metabolism, and better behavioral recovery and survival.

Dr. Cooper explains, "The pH-stat method prevailed until the 1980s and is still preferred for pediatric CPB patients, in whom it clearly yields better postoperative neurologic outcomes and less morbidity. During the past few decades, however, many institutions have converted to using the α-stat strategy in adults because of an increasingly widespread belief that the uncorrected temperature is preferable. Although α-stat proponents claim that lower cerebral blood flow may prevent embolization during hypothermia, this benefit has never been well documented in clinical studies. At THI at SLEH, pH-stat management is standard practice for all CPB patients. We believe that by increasing cerebral blood flow, this method may be able to prevent JVD."

To test this hypothesis, THI researchers compared the α-stat and pH-stat strategies in 38 patients undergoing coronary artery bypass grafting. All patients were elderly (70 years or older) and had diabetes mellitus, a previous stroke, or poorly controlled hypertension, which are risk factors for JVD. Temperature-corrected $PjvO_2$, $PaCO_2$, and jugular venous saturation ($SjvO_2$) were recorded at 3-minute intervals during cooling, stable hypothermia, and rewarming.

Both temperature-corrected and temperature-uncorrected measurements of O_2 and CO_2 tensions were recorded for each sample of jugular bulb venous and arterial blood. The $SjvO_2$ was also recorded.

According to Dr. Cooper, during hypothermia and the first 13 minutes of rewarming, both the temperature-corrected and temperature-uncorrected $PjvO_2$ values were significantly lower in the α-stat group than in the pH-stat group ($P<0.02$). During rewarming, JVD occurred in 6 of the 12 α-stat patients (including 5 with diabetes) and in none of the pH-stat patients. This complication was significantly associated with the development of a temperature-corrected $PjvO_2$ of <30 mm Hg at any time during the preceding period of stable hypothermia ($P<0.01$); in turn, a $PjvO_2$ of <30 mm Hg during hypothermia was significantly associated with a simultaneously measured temperature-corrected arterial $PaCO_2$ of <30 mm Hg ($P<0.0001$).

On the basis of this study, the researchers concluded that adult patients at high risk for poor cerebral autoregulation during CPB, particularly diabetic patients, may benefit from pH-stat management of blood gases.

"Although the debate about the two strategies can be expected to continue, the THI study provides important new evidence in favor of the pH-stat method in these patients," says Dr. Cooper. ●

For more information:

Dr. John R. Cooper, Jr.

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Food and Drug Administration Approves AbioCor™ Artificial Heart for Permanent Use

On September 5, 2006, the Food and Drug Administration approved the AbioCor™ Implantable Replacement Heart (Abiomed, Inc., Danvers, MA) for implantation in patients who are near death due to biventricular failure, are ineligible for a transplant, and would have a life expectancy of only 1 month without the device. O. H. Frazier, MD, chief of Cardiopulmonary Transplantation and director of Cardiovascular Surgery Research at the Texas Heart Institute at St. Luke's Episcopal Hospital, was closely involved in the research and development of the device and has performed 5 of the 14 US implants to date. Currently, the AbioCor is designed to function for 18 months. The longest-surviving patient lived for 17 months after the device was implanted.

Contents

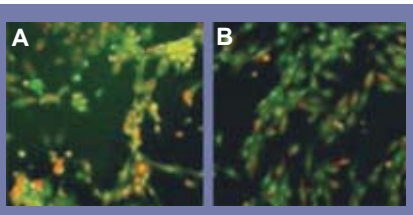
Statin Treatment May Promote Myogenesis and Reduce Stem-Cell Apoptosis in Myocardial Ischemia

Abstract: In murine embryonic stem cells, treatment with simvastatin enhances myogenic differentiation and may protect against cytokine-induced apoptosis.

Hydroxymethylglutaryl coenzyme A (HMG-CoA) reductase is a key enzyme in the control of endogenous cholesterol synthesis. Inhibitors of HMG-CoA reductase, also known as statins, can effectively diminish endogenous cholesterol synthesis and reduce plasma low-density–lipoprotein cholesterol levels in patients with hypercholesterolemia. Although originally developed to lower serum cholesterol levels for primary prevention of coronary artery disease, statins are also being used as therapeutic agents for secondary prevention in patients with myocardial infarction and heart failure. Therefore, they are one of the most frequently prescribed drugs in clinical use. Many beneficial effects of statins may involve mechanisms other than cholesterol-lowering activity. Animal studies of myocardial ischemia or infarction, as well as human clinical trials, increasingly suggest that statins may exert anti-inflammatory effects that help protect cardiac stem cells or myoblasts. These effects may also protect isolated, perfused hearts during ischemia-reperfusion, partly by reducing myocyte apoptosis (*Cardiovasc Res* 2001;649–58).

Recently, in a collaborative effort with the University of Chieti in Italy, a research team led by Yong-Jian Geng, MD, PhD, director of the Heart Failure and Stem Cell Research Laboratory at the Texas Heart Institute at St. Luke's Episcopal Hospital (THI at SLEH) and professor of Medicine at The University of Texas–Houston Medical School, showed that statin treatment protects rat embryonic myocyte progenitors against toxicity caused by cytokine-induced elevations in nitric oxide production (*J Biol Chem* 2005;280:13503–11). Dr. Rosalinda Madonna, a research fellow of Dr. Geng's, was the first author of the report.

According to Dr. Geng, who directs both this laboratory and the Center for Cardiovascular Biology and Atherosclerosis Research at The University of Texas Health Science Center at Houston, "This is a very important issue, because these results suggest that statin therapy may protect the cardiac myocyte progenitors in infarcted or ischemic hearts with inflammation." In collaboration with Drs. James T. Willerson and Emerson Perin at THI at SLEH, Dr. Geng and his co-workers are studying cardiac stem cell therapy for myocardial infarction or heart failure. Postinfarct inflammation is a major challenge for the success of stem cell treatment, because both host and donor stem cells may succumb to apoptosis triggered by the inflammatory microenvironment.



Simvastatin inhibits IL-1-induced apoptosis in rat embryonic cardiac cells. After treatment with IL-1 (**A**) or with IL-1 and simvastatin (**B**), the cells were stained with 2 fluorochromes to identify living (green fluorescence) and apoptotic (red fluorescence) cells. IL, interleukin.

On the basis of the results of these studies, Dr. Geng and his team performed a new study to determine whether statin treatment affects embryonic stem cell (ESC) myogenic differentiation and resistance to apoptosis. They studied murine ESC-derived embryoid bodies (EBs) pre-exposed to simvastatin (the simvastatin group). Some of these EBs were also exposed to L-mevalonate (a precursor of cholesterol), interleukin-1–α (a cytokine produced by inflammatory cells that stimulate myoblasts), or both. For comparison, a control group of EBs received only saline solution.

In cultures, spontaneous cardiac differentiation of the ESCs was heralded by rhythmically beating EB outgrowths. On day 12, the simvastatin group had a higher percentage of beating EB outgrowths than did untreated, control EBs, and the size of the beating area was greater in simvastatin-treated EBs than in control EBs. Further testing suggested that L-mevalonate selectively blocked simvastatin's stimulatory effect on cardiac differentiation.

Dr. Geng says, "These results provide evidence that simvastatin at pharmacologic doses promotes myogenic differentiation in multipotent stem cells. Simvastatin also enhanced cell viability and reduced the numbers of apoptotic cells in cultures treated with interleukin-1–α. Thus, it may protect differentiated cardiac cells and premature embryonic cardiomyoblasts against cytokine-induced apoptosis." He adds, "As our understanding of the effects of statins improves, we'll explore the potential of combined treatment, with both stem cells and statins, for patients with atherosclerotic coronary heart disease. ●

For more information:

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Symposium to Examine the Role of Inflammation in Atherosclerosis

The Texas Heart Institute at St. Luke's Episcopal Hospital (THI at SLEH) and Brigham and Women's Hospital at Harvard Medical School (BWH at HMS) will co-host the symposium Inflammation in Atherosclerosis: Thirty Years of Exploration in Basic and Clinical Science in Boston, Massachusetts, February 23–24, 2007. Faculty will discuss recent laboratory research findings, clinical problems frequently encountered by cardiologists, and basic mechanisms of inflammatory atherosclerotic disease. The symposium will be co-directed by Yong-Jian Geng, MD, PhD, director of the Heart Failure and Stem Cell Research Laboratory at THI at SLEH; Peter Libby, MD, chief of Cardiovascular Medicine at BWH at HMS; Paul M. Ridker, MD, director of the Center for Cardiovascular Disease Prevention at BWH at HMS; and James T. Willerson, MD, president-elect and medical director of THI at SLEH.

For details, visit our website at cme.texasheart.org or call 832-355-2157.

Low Atrial Fibrillation Rate in Heart Transplant Patients Provides Insights Into Treating Primary Atrial Fibrillation

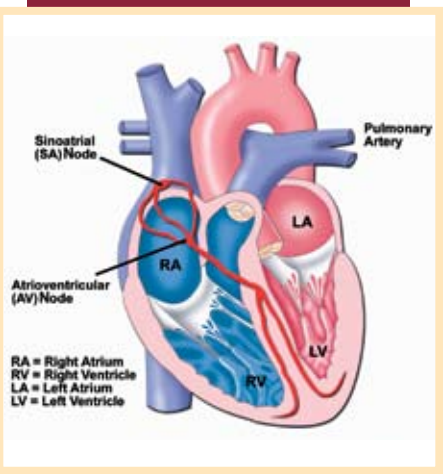
Abstract: The low rate of postoperative atrial fibrillation in heart transplant recipients suggests that cardiac denervation and pulmonary vein isolation may be useful in the surgical treatment of primary atrial fibrillation.

Atrial fibrillation (AF) is a common disorder, affecting approximately 2.2 million Americans. The chief threat AF poses is stroke: not only is AF responsible for about 20% of all strokes, but AF-related strokes are twice as likely to leave patients bedridden than are strokes resulting from other causes.

When pharmacologic treatment alone is insufficient to control AF, a variety of surgical procedures may be used. All of these involve creating lesions designed to interrupt the overactive cardiac electrical pathways that cause AF, but the ways in which this is done range from incising the heart in open operations to using heat, cold, lasers, ultrasound, radiofrequency current, or other energy sources in minimally invasive procedures. Because these minimally invasive techniques are limited in terms of the number and extent of lesions they can create, there is debate about which of the lesions traditionally used in open surgical procedures should be adopted for minimally invasive approaches.

To help answer this question, William E. Cohn, MD, director of Minimally Invasive Surgical Technology at the Texas Heart Institute at St. Luke's Episcopal Hospital, recently examined the incidence of postoperative AF in 500 heart transplant patients. Postoperative AF is very common in cardiac surgical patients, with a reported incidence of 10% to 65% after coronary artery bypass grafting, valve replacement, and other highly invasive cardiac operations. Because heart transplantation is supremely invasive and involves many of the same AF-related risk factors that these other procedures do, including long ischemic times and extensive cardiac manipulation, one might expect postoperative AF to be similarly common in heart transplant recipients. However, Dr. Cohn's data contradict this expectation.

"We found a very low rate of postoperative AF in heart transplant recipients," says Dr. Cohn. "Only 30 out of the 500 patients, or 6.4%, developed AF during the first 30 days after the operation. Furthermore, 12 of those episodes of postoperative AF occurred within 2 weeks of a biopsy-proven transient rejection episode, suggesting that the AF was caused by rejection. If those patients are excluded, the rate of non–rejection-related AF is 18 out of 488, or 3.7%—much lower than the usual postoperative AF rate for most types of cardiac operations."



Central components of the heart's electrical system. In transplanted hearts, this system is isolated from the rest of the patient's nervous system, and the pulmonary vein is electrically disconnected from other parts of the heart, which may reduce the patient's risk of postoperative atrial fibrillation.

Dr. Cohn attributes this low rate of postoperative AF to the cardiac denervation and pulmonary vein isolation that are a necessary part of heart transplantation. He argues that separation of the heart from the surrounding conductive tissues and of the pulmonary vein from the heart interrupts many electrical pathways that might otherwise malfunction and cause AF during the patient's recovery. If this theory is correct, the low rate of postoperative AF in cardiac transplant recipients has implications for the treatment of other kinds of AF.

"The apparent association of cardiac denervation and pulmonary vein isolation with reduced postoperative AF suggests that these surgical steps could be valuable for treating primary AF, especially with minimally invasive methods," says Dr. Cohn. "Hopefully, our findings will inspire some trials of these maneuvers in minimally invasive interventions for primary AF." ●

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Symposium to Address Common Problems Faced by Physicians Who Treat Patients With Cardiac Arrhythmias

The Eighth Symposium on Cardiac Arrhythmias: New Pharmacologic and Interventional Strategies will be held at the The Houstonian Hotel on February 17, 2007. Faculty members will discuss the evaluation and treatment of patients with supraventricular and ventricular arrhythmias, the molecular and cellular basis of conduction disturbances, and challenges in the treatment of patients with cardiac arrhythmias. The symposium will be directed by Ali Massumi, MD, director of the Center for Cardiac Arrhythmias and Electrophysiology at THI at SLEH.

For details, visit our website at cme.texasheart.org or call 832-355-2157.

Influenza Vaccination for Patients with Cardiovascular Disease Gains Wider Support

Abstract: Encouraged by a recent advisory recommending influenza vaccination for patients with cardiovascular disease, THI researchers continue to study links between influenza and heart disease.

Last fall, the American Heart Association (AHA) and American College of Cardiology (ACC) issued an advisory strongly urging influenza vaccination for patients with cardiovascular disease (CVD) (*Circulation* 2006;114:1549; *J Am Coll Cardiol* 2006; 48:1498). The joint advisory was supported by evidence that influenza may trigger as many as 90,000 fatal myocardial infarctions (MIs) annually in the United States alone. Moreover, recent studies have confirmed that influenza has secondary adverse effects on CVD patients and that vaccination can lower the risk of cardiac death and other adverse events.

The advisory came as welcome, but not unexpected, news to Mohammad Madjid, MD, senior research scientist at the Texas Heart Institute at St. Luke's Episcopal Hospital (THI at SLEH). Since 2000, he and S. Ward Casscells, MD, associate director of Basic Cardiology Research at THI at SLEH, have been elucidating the links between influenza and seasonal spikes in cardiac mortality and have been regarding influenza as a modifiable cardiac risk factor (see *Heart Watch*, Summer 2003, texasheart.org/heartwatch).

"Back in 2003, in a review in *Circulation* (2003;108:2730), we urged the AHA and ACC to recommend flu shots for patients with CVD. Later, in a letter to *The Lancet* (2004;365:1309), we were the first to alert cardiologists to the danger their patients will face from a flu pandemic," says Dr. Madjid. "In fact, there's strong historic evidence that in every flu epidemic of the early twentieth century except the pandemic of 1918, cardiovascular disease surpassed all other causes of death, including pneumonia."

In Dr. Madjid's opinion, the link between influenza and cardiac death would have been recognized and acknowledged long before now had it not been for an unintentional epidemiologic bias.

"In past epidemics, it's possible that many cardiac-related deaths were wrongly attributed to pneumonia or other acute respiratory diseases (ARDs)," says Dr. Madjid. "Up to a third of MIs manifest through atypical chest pain that, in a patient with pneumonia, might easily be dismissed as noncardiac."

> *"The connection between influenza, acute respiratory diseases, and cardiovascular disease has been unmasked, and it's now time to educate physicians and cardiovascular patients, especially older ones, about the benefits of influenza vaccination."*
>
> *—Mohammad Madjid, MD*
> *Senior Research Scientist*
> *Texas Heart Institute*

> *"Influenza vaccination is now recommended with the same enthusiasm as control of cholesterol, blood pressure, and other modifiable risk factors."*
>
> *—AHA/ACC Scientific Advisory, 2006*

Recently, Dr. Madjid and his coworkers teamed up with Russian investigators to explore the reasons for this potential bias. Focusing on weekly mortality data from St. Petersburg in the years 1993–2000, they found that influenza epidemics and winter peaks in ARDs were always accompanied by a noticeable rise in coronary artery–related deaths, especially in older men. They also found that during flu season, the overall odds of suffering an MI or a coronary artery–related death significantly increased.

"The connection between influenza, ARDs, and CVD has been unmasked," says Dr. Madjid, "and it's now time to educate physicians and CVD patients, especially older ones, about the benefits of influenza vaccination. That's one reason why, in fall 2004, we conducted a national telephone survey to gauge the public's knowledge of, and attitudes toward, vaccination."

Recently analyzed but not yet published, the survey's main results are intriguing. Of the 1202 adults interviewed, 154 (11.2%) had a history of CVD, and nearly half (46%) were at least 65 years old. Overall, more than half (57%) had been vaccinated in the previous year (2003–04), and more than two thirds (68%) had been, or planned to be, vaccinated for the coming flu season (2004–05).

"Interestingly, the older the respondent, the more likely that he or she had been vaccinated," noted Dr. Madjid. "Still, it was discouraging that 1 in 3 subjects with CVD, regardless of age, did not consider themselves at high risk for CVD-related complications of influenza or in need of vaccination. This finding, combined with the AHA/ACC advisory's acknowledgment that only 34% of CVD patients get vaccinated each year, clearly shows that we're nowhere near reaching the goal of universal vaccination for all CVD patients."

"I'm optimistic, though, that attitudes toward vaccination for CVD patients will gradually change," says Dr. Madjid, "now that the AHA and ACC have acknowledged its benefits and wholeheartedly endorsed it." ●

For more information:

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Detection of Coronary Artery Disease by Stress Perfusion Cardiac Magnetic Resonance Imaging

Abstract: Stress perfusion cardiac magnetic resonance imaging, followed by delayed-enhancement imaging, safely and accurately detects coronary stenosis in patients with suspected coronary artery disease.

Over the last few years, cardiac magnetic resonance imaging (CMRI) has been used as a safe, reproducible method for noninvasively obtaining a comprehensive evaluation of cardiac function. Because of its high spatial resolution and the absence of radiation exposure, CMRI is emerging as a valuable tool for assessing myocardial perfusion in patients with suspected coronary artery disease (CAD).

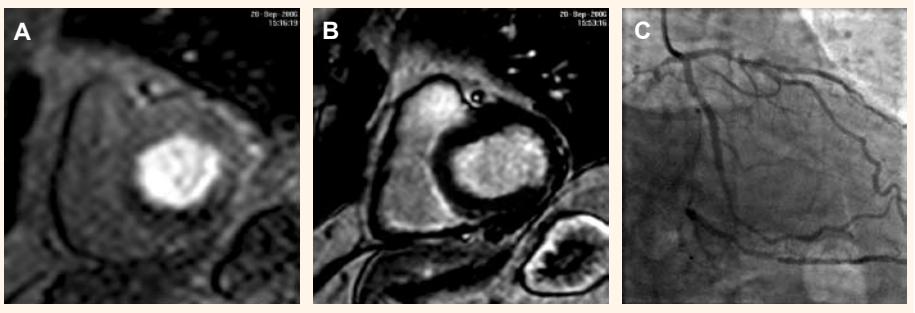
Recent studies have shown that a multimodal approach, using stress perfusion CMRI followed by delayed enhancement (DE) imaging, is an accurate method of detecting CAD (*Radiology* 2006;240:39–45; *J Am Coll Cardiol* 2006;47:1630–38).

"This combined approach yields a sensitivity, specificity, and accuracy in the range of 87% to 89% for the diagnosis of CAD. These results are comparable to those obtained with single photon emission computed tomography but offer better spatial resolution," says Benjamin Cheong, MD, a noninvasive cardiologist in the Cardiovascular MRI/CT unit at the Texas Heart Institute at St. Luke's Episcopal Hospital (THI at SLEH). "We use stress CMRI in patients with chest pain suggestive of CAD who have an intermediate pretest probability of CAD."

"In a typical test," says Dr. Cheong, "after taking baseline views, we examine myocardial perfusion during adenosine-induced vasodilation—the stress study. About 15 minutes later, we evaluate perfusion at rest without vasodilation. In between the stress and the rest studies, we obtain data on ventricular function and valvular status."

The final part of the examination involves DE imaging to detect areas of myocardial infarction and necrosis; even small subendocardial infarcts can be detected with this technology. The entire imaging session lasts 45 to 50 minutes.

Stress CMRI testing with DE imaging has recently been studied as a gatekeeping tool for selecting patients for coronary angiography, the gold standard for diagnosing CAD (*Clin Res Cardiol* 2006;95:531–8). This noninvasive method of screening for angiography is targeted at patients in the ACC/AHA class II indication group, who have fewer positive test results on angiography than do class I patients. The use of CMRI may help clinicians decide who should undergo angiography, eliminating unnecessary invasive procedures and reducing the rate of purely diagnostic coronary angiography in patients with an intermediate probability for CAD.



A) Myocardial perfusion stress test using adenosine. Transmural hypoperfusion is present in the basal inferior wall. **B**) Viability/scar imaging indicates the presence of full-thickness, viable-appearing myocardium in the basal inferior wall. **C**) Invasive coronary angiography in the caudal right anterior oblique view, showing an occluded proximal right coronary artery with retrograde filling from the left coronary artery system.

In addition to detecting CAD, stress perfusion CMRI with DE imaging is used at THI at SLEH to assess the ventricular response to stem cell infusion and the effect of stem cells on myocardial perfusion in CAD patients. Furthermore, CMRI perfusion studies can be used to screen for posttransplant vasculopathy, which usually requires invasive cardiac catheterization. However, not all patients are candidates for stress perfusion CMRI.

"Claustrophobia, the presence of metallic implants such as pacemakers, and the inability to maintain a breath-hold are contraindications for CMRI," explains Dr. Cheong.

In summary, stress perfusion CMRI combined with DE imaging is an effective method for detecting coronary artery stenosis. This combination has several advantages over other technologies, including superior spatial resolution and an excellent safety profile.

"In less than 1 hour, we can perform this stress test, evaluate left ventricular function, and image any scar tissue, giving physicians a comprehensive clinical picture of their patients' cardiac health. It's a '1-stop' test for patients with suspected CAD," says Dr. Cheong. ●

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Calendar of Events

Texas Heart Institute Continuing Medical Education Symposia

Inflammation and Atherosclerosis: Thirty Years of Exploration in Basic and Clinical Science
Program Directors: Yong-Jian Geng, MD, PhD; Peter Libby, MD; Paul M. Ridker, MD; and James T. Willerson, MD
February 23–24, 2007 • Boston, Massachusetts

Eighth Symposium on Cardiac Arrhythmias: New Pharmacologic and Interventional Strategies
Program Director: Ali Massumi, MD
February 17, 2007 • Houston, TX

Selected Upcoming National and International Meetings

Society of Thoracic Surgeons 43rd Annual Meeting
January 29–31, 2007 • San Diego, CA

American College of Cardiology 56th Annual Scientific Session
March 24–27, 2007 • New Orleans, LA

International Society for Heart and Lung Transplantation 27th Annual Meeting and Scientific Sessions
April 25–28, 2007 • San Francisco, CA

American Surgical Association 127th Annual Meeting
April 26–28, 2007 • Colorado Springs, CO

European Society for Cardio-Vascular Surgery
May 17–20, 2007 • Venice, Italy
Abstract submission ends January 20, 2007

International Society for Heart Research 19th World Congress
June 22–26, 2007 • Bologna, Italy
Scientific Chair: James T. Willerson, MD
Abstract submission: January 31, 2007

American Heart Association Scientific Sessions 2007
November 4–6, 2007 • Orlando, FL
Abstract submission: April 2–June 1, 2007

For information about the Texas Heart Institute CME activities listed above, please e-mail cme@heart.thi.tmc.edu or call 832.355.2157. To view selected CME presentations and other physician resources online, visit cme.texasheart.org.

For 16 consecutive years, the Texas Heart Institute at St. Luke's Episcopal Hospital has been ranked among the top 10 heart centers in the United States by *U.S. News & World Report*'s annual guide to "America's Best Hospitals."

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