CPR by Bystanders Infrequent, Often Inadequate

BY SHARON WORCESTER
Southeast Bureau

Bystander-initiated cardiopulmonary resuscitation saves lives but occurs far too infrequently and is often provided inadequately, according to a scientific statement from the American Heart Association.

The statement calls for a concerted effort by health care providers, policy makers, and community leaders to provide education and training to improve the rate and quality of bystander CPR (Circulation 2008 [Epub doi: 10.1161/CIRCULATIONAHA.107.188486]).

"CPR is an inexpensive and readily available technique that can save lives. Therefore, the number of people trained in CPR must increase, and the quality of CPR provided by every rescuer must improve," Dr. Benjamin S. Abella, lead author of the statement, and his colleagues wrote.

Although high-quality CPR provided by bystanders has been shown in numerous studies to improve the rates of survival to hospital discharge, in many communities only 15%-30% of victims receive bystander CPR before emergency medical services personnel arrive at the scene. With arrival times often occurring after 7-8 minutes, and a drop in survival rates of 7%-10% for each minute without CPR, the lack of bystander-initiated CPR can have a dramatic impact on patient outcome.

"In communities where widespread CPR training has been provided, survival rates from witnessed sudden cardiac arrest associated with [ventricular fibrillation] have been reportedly as high as 49% to 74% … unfortunately, on average, approximately 6% of out-of-hospital sudden cardiac arrest victims survive to hospital discharge in the United States," Dr. Abella, clinical research director for the Center for Resuscitation Science at the University of Pennsylvania, Philadelphia, said in a statement.

Studies show that even when CPR provided by a bystander and CPR provided by trained health care professionals are provided, they are too often provided inadequately, with chest compressions that are too shallow or interrupted too often, and with excessive rates of rescue breathing.

The authors provide a number of recommendations to improve the rate and quality of bystander CPR, including:

► **Broadening CPR training.** Creative new approaches to reach a larger public audience are needed. A 22-minute, self-instructional program available through the AHA is an example of a tool that can be used outside the classroom. The statement also calls for community and corporate programs to encourage CPR education, and suggests that training be provided in high schools as a prerequisite for graduation and in hospitals for families of patients at risk for sudden cardiac arrest. The development of dispatcher-assisted "telephone CPR" that can provide better assistance to untrained bystanders is also recommended.

► **Addressing common barriers to lay-rescuer action.** Bystanders are often reluctant to perform CPR out of fear of disease transmission, fear of legal liability, or as a result of the complexity of guidelines and instructional materials (which hampers both learning and delivery of bystander CPR). Thus, in addition to education about the value of quick action for saving lives, the public should be better informed about the very low risk of disease transmission (there have been no reported cases of HIV or hepatitis transmission via CPR, for example) and the availability of mouth-to-mouth barrier devices and gloves, which should be mandated wherever an automatic external defibrillator (AED) is stationed. Information about Good Samaritan laws that protect bystanders from liability should be included in CPR training and posted prominently near AED stations.

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DR. ABELLA

► **Improving lay rescuer and emergency medical services programs.** These programs can be upgraded by providing a process for continuous quality improvement. Reviews of resuscitation efforts and quality of CPR provided by bystanders and dispatchers are needed, as is monitoring (by health care systems that provide CPR services) of the quality of CPR provided during resuscitation efforts.

Additionally, the AHA statement suggests that Internet-based CPR education and certification programs be developed, and that research be conducted to identify the best educational methods for delivering the highest quality and broadest-reach CPR training, the optimal target populations for CPR education, the value of dispatch-assisted CPR in a variety of communities, and the public perceptions that serve as barriers to CPR training and administration.

"If the rate and quality of bystander CPR are increased substantially, the potential exists to save the lives of thousands of victims of [sudden cardiac arrest] each year," the authors concluded. ■

Perioperative β-Blocker Regimen Boosts Risk of Mortality

BY MITCHEL L. ZOLER
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ORLANDO — A strikingly elevated risk for stroke and total mortality in patients who received the β-blocker metoprolol CR starting a few hours before noncardiac surgery in a trial with more than 8,000 patients triggered a quick change in practice in hospitals across the United States.

"β-Blockers should not be routinely started perioperatively to reduce cardiac events," Dr. Judith S. Hochman commented at the annual scientific sessions of the American Heart Association. The findings presented at the meeting were a "landmark that will change practice," added Dr. Hochman, professor of cardiology at New York University, New York.

"Many hospitals have been driven by guidelines to start β-blocker treatment on the morning of surgery. Hospitals will quickly need to rethink those protocols," commented Dr. Lee A. Fleisher, professor and chairman of anesthesiology and critical care at the University of Pennsylvania in Philadelphia.

But experts stressed that the new findings do not apply to patients on an established β-blocker regimen at the time they undergo elective, noncardiac surgery, and that it remains unclear whether it's beneficial to titrate patients at risk of cardiovascular complications onto a β-blocker regimen starting a few weeks before surgery.

The Perioperative Ischemic Evaluation (POISE) trial was designed to be the first large-scale test of a prophylactic approach that's been widely used for several years on at-risk patients undergoing noncardiac surgery. The study enrolled patients at 193 centers in 23 countries during October 2002 to July 2007. Eligible patients were 45 years or older, were scheduled for noncardiac surgery, and had intermediate to high risk for atherosclerotic disease. The mean age of the enrolled patients was 69, and 82% had documented, underlying cardiac, carotid, or peripheral atherosclerotic disease. The study excluded patients already on a β-blocker and patients who were scheduled to start a β-blocker prior to surgery.

Patients were randomized to receive either 100-mg oral metoprolol CR or placebo 2-4 hours before surgery. Patients in the β-blocker group received a second 100-mg oral dose of metoprolol CR within 6 hours after surgery as long as their heart rate was above 80 bpm and their systolic blood pressure was greater than 100 mm Hg. Treatment with metoprolol CR was continued for 30 days, but was reduced if the heart rate or systolic pressure dropped too low.

The primary end point was the rate of cardiovascular death, nonfatal myocardial infarction, and nonfatal cardiac arrest during the 30 days after surgery. This rate was significantly lower, by 0.9%, in the metoprolol group, Dr. P.J. Devereaux reported. The difference was largely due to a reduced rate of nonfatal myocardial infarction—5.1% in the placebo group and 3.6% with metoprolol, a significant difference.

Metoprolol treatment was also linked with significantly higher rates of serious adverse effects: a statistically significant twofold boost in the risk of strokes (a 1.0% rate, vs. a 0.5% rate with placebo), most of which were incapacitating, and significant increases with metoprolol in clinically significant episodes of hypotension and bradycardia. Metoprolol treatment was also linked with a significantly higher rate of all-cause death, 3.1% vs. 2.3% with placebo.

"Knowing these data, I certainly would not recommend this treatment for my mother," said Dr. Devereaux, a cardiologist at McMaster University in Hamilton, Ont., and lead investigator of the study. The study was primarily funded by national agencies in Canada and other countries, but it also received support from AstraZeneca, which markets metoprolol CR (Toprol XL). Dr. Devereaux had no disclosures for the study.

The analysis also failed to identify any patient subgroup that had less risk and a clearer overall benefit from β-blocker treatment.

The results will force a substantial change in practice. Just a few weeks before Dr. Devereaux gave his report, a joint AHA/American College of Cardiology task force issued updated guidelines for the perioperative care of patients undergoing noncardiac surgery. The guidelines say: "β-Blockers are probably recommended for patients in whom preoperative assessment identifies CHD or high cardiac risk, as defined by the presence of more than one clinical risk factor, who are undergoing intermediate-risk or vascular surgery" (Circulation 2007;116:e418-99).

Although the guidelines made β-blockers an option, many hospitals have been getting graded on the quality of their care based in part on whether they had a protocol in place to start a β-blocker on virtually all higher-risk, noncardiac surgery patients, said Dr. Fleisher, who chaired the ACC/AHA task force. That practice will now have to quickly change, he said in an interview.

There is a pressing need to find safe treatments to prevent cardiovascular complications of noncardiac surgery, said Dr. Devereaux in an interview. Currently there is a "large and growing epidemic of perioperative cardiovascular disease," he said. "Patients die after successful surgery due to their cardiovascular complications." Other drugs that might be beneficial to start just before surgery, or possibly days or weeks before, include statins and aspirin, he said.

Results from another major trial are expected soon that will shed added light on this issue. The Dutch Echocardiographic Cardiac Risk Evaluation Applying Stress Echocardiography (DECREASE)-IV trial has enrolled about 6,000 patients scheduled for noncardiac surgery, and randomized them to treatment with the β-blocker bisoprolol or placebo, and also randomized patients to treatment with fluvastatin or placebo. Unlike POISE, patients in DECREASE-IV could be started on bisoprolol and fluvastatin as much as 30 days before surgery.

A longer titration period and a β-blocker regimen that's stable for several days before surgery might improve outcomes, as might the use of bisoprolol instead of metoprolol, Dr. Don Poldermans, professor of anesthesiology at Erasmus University, Rotterdam, the Netherlands, and senior investigator for DECREASE-IV, said in an interview. ■