Prehospital ECGs Shorten Door-to-Balloon Times

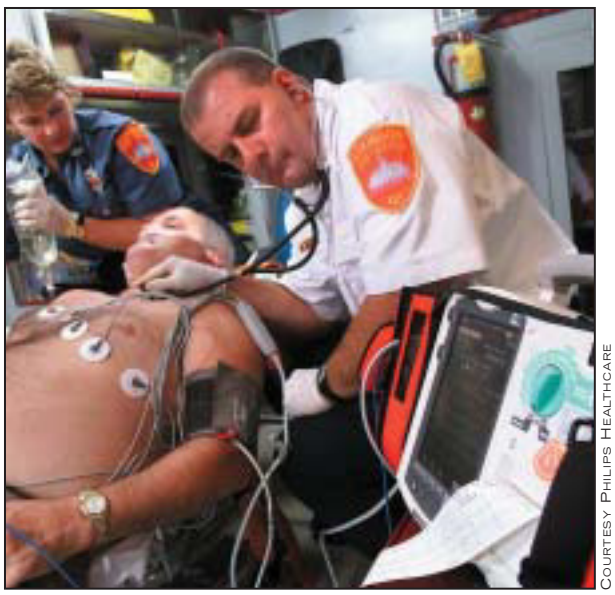
BY ELIZABETH MECHCATIE

Almost 90% of patients with a prehospital electrocardiographic diagnosis of ST-elevation myocardial infarction had a "door-to-balloon" time of 90 minutes or less, a study has shown.

The 86% rate—the average of the 10 regional networks of U.S. hospitals studied, surpassed the target— at least a 75% rate—set by the American College of Cardiology Door-to-Balloon (D2B) Alliance in 2006, reported Dr. Ivan Rokos, an emergency physician at the University of California, Los Angeles, and his associates.

Moreover, each individual center in the study achieved the D2B Alliance's target, ranging from 77% in Atlanta to 97% in Minneapolis/St. Paul, they reported (J. Am. Coll. Cardiol. Intv. 2009;2:339-46).

Regional STEMI Receiving Center (SRC) networks—established in 2006 as a grassroots effort to coordinate care with an ECG diagnosis of STEMI identified by EMS personnel before patients reach the hospital—contributed data to the study. SRC hospitals and networks, managed independently, meet criteria that include equipping EMS personnel with 12-lead ECG machines to diagnose acute STEMI in any patient who has called 911 with symptoms suggestive of acute cardiac ischemia. They also follow a protocol that directs paramedics to transport patients with a presumed STEMI on the ECG to the nearest designated SRC, a hospital that provides primary percutaneous coronary intervention (PPCI).



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Ten regional networks equipped EMS personnel with 12-lead ECG machines to speed diagnosis of STEMI.

The study analyses were performed using pooled data on patients from the 10 networks, which represent 72 hospitals that range from urban to semirural. Five of the networks were based in California, in Marin, Ventura, Los Angeles, Orange, and San Diego counties. The other networks were in Medford, Ore.; Royal Oak, Mich.; Charlotte N.C.; Atlanta; and Minneapolis–St. Paul, Minn.

These results indicate that "when we collaborate, we can put together a seamless system so instead of having EMS, the ED, and cardiology all sort of coexist, as they have done literally for decades, they are now coordinated into one seamless care unit that can deliver very fast care," Dr. Rokos said in an interview. He emphasized the multidisciplinary nature of the collaboration that also includes quality improvement staff and administrators.

The study also shows that in areas with such networks, 911 "can provide entire communities with access to quality STEMI care," he added.

In the study, 2,712 patients were diagnosed with a STEMI with an ECG before arriving at the hospital, and were transported directly to the nearest SRC, where 76% of the patients underwent PPCI. The primary end point was the proportion of patients who had an intervention within 90 minutes or less. Shorter door-to-balloon times were secondary end points: 50% of the patients had a D2B time of 60 minutes or less, 25% had a time of 45 minutes or less, and 8% had a time of 30 minutes or less.

A unique finding of the study was that the rate of EMS contact to balloon time of 90 minutes or less was 68% among the five regions that measured this.

The study results indicate that "successful use and broad translation" of prehospital ECGs "could be achieved with the creation of regional SRC networks focused on prehospital cardiac triage," the investigators said.

The authors pointed out that in 2005, the rate of door-to balloon times of 90 minutes or less at four major hospitals in Los Angeles County was less than 50% for STEMI patients transported to the hospital by EMS, even though EMS providers routinely performed pre-hospital ECGs. In the current study, however, the rate was 90% among the patients in the L.A. County region.

Acquiring an ECG before arriving at the hospital "represents an evidence-based yet underused strategy to reduce door-to-balloon times," they added.

In the interview, Dr. Rokos said the finding that "a quarter of our patients had a door-to-balloon time of 45 minutes or less, which is twice the speed of our national benchmark, is truly remarkable," especially considering that this was not dependent on building new cath labs, but "coordinating existing cath labs, paramedics, and hospitals."

In an accompanying editorial, Dr. Christopher Granger of Duke Clinical Research Institute, Durham, N.C., said that the study's "most important lesson … is that reperfusion with primary PCI can be provided more rapidly if EMS is placed in its rightful position as the front line for integrated STEMI care" (J. Am. Coll. Cardiol. Intv. 2009;2:347-9).

Expanding what the 10 networks have done "on a national scale—refined and coupled with better EMS support, data collection and feedback—will improve care and save lives," he added. ■

Early Eptifibatide Is No Better Than Delayed Drug

BY MICHELE G. SULLIVAN

Routinely administering eptifibatide before angiography confers no survival benefit in patients with non–ST-segment elevation acute coronary syndromes, nor does early use reduce the number of subsequent heart attacks, compared with the use of eptifibatide after angiography, a large randomized controlled trial has concluded.

Further, early eptifibatide use, compared with delayed use, also carries a significantly increased risk for major bleeding, Dr. L. Kristin Newby said at a press teleconference during the annual meeting of the American College of Cardiology.

Guidelines in North America and Europe vary in their recommendations regarding early versus delayed provisional treatment with eptifibatide and other glycoprotein IIb/IIIa inhibitors, said Dr. Newby of Duke University Medical Center, Durham, N.C. Treatment decisions are usually guided by clinician preference or hospital policy. But the results of the Early Glycoprotein IIb/IIIa Inhibition in Non-ST-Segment Elevation Acute Coronary Syndrome (EARLY ACS) trial may be strong enough to warrant a recommendation by the American College of Cardiology, she said. "I believe the guidelines committee will have to carefully consider these findings."

EARLY ACS included 9,492 patients who had acute coronary syndrome without ST-segment elevation and were scheduled for an invasive intervention. Patients were assigned to one of two eptifibatide regimens. Early use consisted of two boluses of eptifibatide (180 mcg/kg of body weight each) given 10 minutes apart at least 12 hours before angiography and followed by a standard infusion. Delayed provisional use consisted of a matching placebo infusion with provisional use of eptifibatide after angiography.

The primary end points were a composite of all-cause mortality, heart attack, and recurrent ischemia requiring urgent revascularization, or a thrombotic complication during percutaneous coronary intervention within 96 hours. The secondary end point was a composite of death or heart attack within 30 days (N. Engl. J. Med. 2009; Mar. 30 [doi 10.1056/NEJMoa0901316]).

The patients' median age was 67 years. The median time from presentation of symptoms to randomization was almost 6 hours. Almost all (98%) underwent coronary angiography, and 59% later underwent PCI.

Compared with delayed administration, early administration of eptifibatide was not associated with any significant reduction in the composite primary end point (10.0% vs. 9.3%, respectively), or in the secondary end points of death or heart attack at 30 days (12.3% vs. 11.2%).

There were no significant differences between the groups in death from any cause; in the combination of death, heart attack, or urgent revascularization; or in any of the individual end points.

When bleeding severity was rated according to the Global Utilization of Streptokinase and Tissue Plasminogen Activator for Occluded Coronary Arteries criteria, there was significantly more moderate bleeding in the early-administration group than in the delayed-administration group (6.8% vs. 4.3%; odds ratio, 1.6). When both severe and moderate bleeding were considered, the early strategy also carried a significantly increased risk (5.1% vs. 2.7%; OR, 1.9). Patients in the early administration group also required significantly more transfusions of packed red cells (8.6% vs. 6.7%; OR, 1.3).Dr. Newby said the EARLY ACS investigators are reviewing their data to identify subgroups of patients who have a low risk of bleeding and might benefit from early eptifibatide. "So far, we've seen no statistically significant interactions in our subgroup analyses, but we have seen some hints that patients who are troponin positive might get some benefit."

Dr. Marc Cohen, professor of cardiology at Mount Sinai School of Medicine, New York, said, "I think it is fair to say that certain subgroups within the study may have diluted an otherwise important benefit from being observed. Specifically, the subgroup that was troponin negative—a group that we know from the year of the flood is not benefited with glycoprotein IIb/IIIa inhibitors—was not benefited in the EARLY-ACS trial and may have pulled the point estimate toward the neutral zone.

"In summary, I have to acknowledge that routine upstream administration of eptifibatide in high-risk, unstable angina or NSTEMI patients is not supported. I feel that several protocol-related variables may have contributed to a dilution of a beneficial effect," he said.

The study was funded by Schering-Plough Corp. and Millennium Pharmaceuticals. Dr. Newby disclosed receiving grant support from Schering-Plough, and some of her coinvestigators disclosed that they receive some financial support from Schering-Plough.

Dr. Cohen said that he had no conflicts to disclose in regard to this study. ■