HEART OF THE MATTER

Preventing Sudden Death After Myocardial Infarction

Among individuals who experience an acute myocardial infarction, approximately half will die of sudden death, and it often occurs outside of the hospital. The benefit of automatic implantable cardioverter defibrillators (ICDs) in high-risk patients with left ventricular dysfunction with chronic ischemic heart failure has focused our attention on ways of preventing sudden death.

BY SIDNEY GOLDSTEIN, M.D.

Unfortunately, ICDs have been found to be ineffective and perhaps dangerous in the first 30 days after an acute MI, when such patients are at the greatest risk of sudden death (N. Engl. J. Med. 2004;351:2481-8).

A recent epidemiologic study from the Mayo Clinic of the population in Olmsted County, Minn., examined the occurrence of sudden death in the 30 days after an acute MI. It provides some interesting insight into the change in the frequency of sudden death during the last 25 years and underscores the importance of β-blocker therapy in patients experiencing an acute MI (JAMA 2008;300:2022-9).

In the Mayo Clinic study, sudden death was the cause of 24% of all deaths that occurred in acute MI patients between 1987 and 2005. Of the 59 sudden deaths that occurred in the first year after an acute MI, 35 (59%) occurred in the first 30 days after the MI. However, during the 27 years of the study, the incidence of sudden death decreased significantly. Compared with the period of 1979 to 1987, the risk of sudden death was reduced by 20% during 1988-1997, and by 38% during 1998-2005. The concomitant occurrence of heart failure doubled the rate of sudden death.

Many changes in the therapy of patients experiencing an acute myocardial infarction have occurred since that study began in 1979, including the use of thrombolytics, percutaneous coronary intervention, and coronary artery bypass surgery. All of these interventions have had an important impact on decreasing post–acute MI mortality. However, the only intervention initiated in that period that has been shown to affect sudden death is β-blocker therapy.

First reported in 1981, β-blocker therapy in large multicenter clinical trials both in the United States and Europe indicated that these drugs have a profound effect on total mortality after an acute MI and are particularly effective in preventing sudden death.

In the Beta-Blocker Heart Attack Trial (BHAT), β-blockers initiated within 7 days of hospitalization for an acute myocardial infarction decreased all mortality by 26% and sudden death by 28%. In BHAT patients with heart failure, therapy with β-blockers resulted in a 47% decrease in sudden death. Propranolol was used in BHAT, initiated at a dose of 120 mg daily and increased to 160-180 mg at 4 weeks.

Despite these reported effects, β-blocker therapy was poorly accepted for the routine treatment after an acute MI. Well into the 1990s, fewer than 50% of patients who had experienced an acute myocardial infarction received that therapy. It was not until the incorporation of β-blocker therapy as a quality measure by the National Committee for Quality Assurance (NCQA) in 1996 and the subsequent inclusion in American Heart Association–American College of Cardiology guidelines in 2000 that they were more widely used. Now, well over 90% of patients discharged from the hospital after an acute myocardial infarction are treated with β-blockers. It is often a low dose, but they are receiving some therapy nonetheless.

Although we cannot be certain what led to the decrease in sudden death in Olmsted County, it is tempting to presume that at least it can be attributed in part to the temporal changes in β-blocker usage.

Quality improvement programs provide a measure of whether or not a drug is ordered, but they do not measure the dose used. Equating the propranolol doses in BHAT to the contemporary β-blockers carvedilol and metoprolol succinate, both of which have been shown to provide benefits similar to that of propranolol, calls for daily doses up to 50 mg and 200 mg, respectively. The NCQA has recently introduced a new measure to ensure continuing therapy after 6 months, after a study in 2006 indicated that only 71% of patients after an acute myocardial infarction were still receiving β-blockers.

The observations from Olmsted County place in perspective the success of the quality improvement process in mitigating mortality in acute myocardial infarction. They also should provide an important encouragement for the practitioner to use full doses of contemporary β-blockers and to continue therapy. ■

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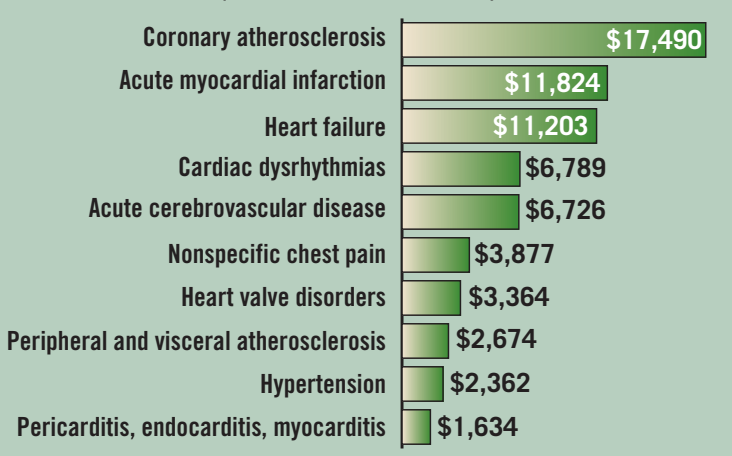

Note: Based on 2006 data from the Nationwide Inpatient Sample.
Source: Agency for Healthcare Research and Quality

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