MedicalXpress

Biomarker-guided heart failure treatment significantly reduces complications

October 17 2011

Adding regular testing for blood levels of a biomarker of cardiac distress to standard care for the most common form of heart failure may significantly reduce the incidence of cardiovascular complications, a new study finds. The report from investigators at the Massachusetts General Hospital (MGH) Heart Center, appearing in the Oct. 25 *Journal of the American College of Cardiology*, describes how adjusting therapy to keep levels of the protein NT-proBNP below 1,000 pg/ml reduced hospitalizations for heart failure symptoms by half, along with lowering rates of arrhythmias, stroke, heart attack and cardiac death. Preliminary results of the study - results of which were so striking that enrollment was halted halfway through the planned schedule - were presented in November at the American Heart Association 2010 Scientific Sessions.

"These results represent a turning point in our understanding of biomarker-guided care for heart failure," says James Januzzi Jr., MD, of the MGH Cardiology Division, corresponding author. "The major lessons learned from our study are that setting and achieving low NT-proBNP goals is essential and when those goals are met through excellent patient care, we can expect substantial improvements in outcomes compared to standard care."

A major and growing cause of death, heart failure occurs when an impaired heart muscle cannot pump blood efficiently. Patients are treated with combinations of medications - including beta blockers, aldosterone blockers, vasodilators and diuretics. But short of waiting for and responding to worsening symptoms there has been no way for

physicians to easily monitor how well an individual is responding to treatment. Several studies have shown that blood levels of NT-proBNP drop after treatment begins and such changes can predict prognosis, but trials using target levels of the protein to guide treatment have had inconsistent results.

The current investigation - called the PROTECT study - was restricted to patients with dysfunction of the left ventricle and set an ambitious goal of reducing NT-proBNP levels from an average level of over 2,000 pg/mL in untreated participants at the beginning of the trial to below 1,000 pg/mL. All study participants received standard heart failure treatment, which uses clinical targets such as blood pressure and heart rate to guide medication dosage. But for half of them, measuring NT-proBNP blood levels was included in their regular assessments, and medication was adjusted to reach the NT-proBNP target.

Among the 151 patients who participated in the four-year trial, the rates of worsening heart failure symptoms and heart failure hospitalization were cut in half for those whose care was guided by NT-proBNP measurement. Participants in the NT-proBNP group also reported significantly better quality of life, compared with the standard care group, and were shown by echocardiography to have greater improvement in both the structure and function of the heart muscle.

"We feel strongly that the concept of biomarker-guided care - which allows us to give the drugs we already have in a more individualized manner - is here to stay. However, the results we achieved in this study need to be replicated in a larger, multicenter trial, which is currently in the works along with a study examining natriuretic peptide testing in the home," says Januzzi, an associate professor of medicine at Harvard Medical School. "If these results pan out the way we expect, this approach could lead to improved cardiac function and better quality of life for patients, as well as reduced health care expenditures. The use of

biomarkers as an objective tool to monitor and guide care has come a long way since the first pilot studies. We know much more now about the approach and how it is best used. The potential for this approach is considerable."

Provided by Massachusetts General Hospital