CMR Trumps Echo in Heart Failure Diagnoses

BY ROBERT FINN
San Francisco Bureau

SAN FRANCISCO — Cardiac MRI with late gadolinium enhancement is the imaging technique of choice when the goal is tissue characterization and infarct detection in heart failure, Dr. Christopher M. Kramer said at a cardiovascular imaging conference sponsored by the American College of Cardiology.

Cardiac magnetic resonance (CMR) provides outstanding image quality, excellent quantification, and tissue characterization, said Dr. Kramer of the University of Virginia, in Charlottesville. In addition, Gadolinium contrast is easy to use and safe with CMR and also offers the ability to assess intramural function.

Echo is useful for diastolic function and when 'quick and easy' is adequate; CMR is best for regional systolic function and when quantitation is needed.

However, CMR devices are not portable, are quite expensive, and are not readily available. Physicians need to have extensive training in the use of CMR and the technique is not suitable for patients with implanted metallic devices such as pacemakers and implantable cardioverter defibrillators. Furthermore, assessment of diastolic function is not routine with CMR.

Echocardiography also has a number of advantages. The devices are portable and relatively inexpensive, and they are readily available. Generations of cardiologists have established its validity and all cardiologists become proficient in the use of echo during their training. Contrast can be added to echocardiography, and the assessment of diastolic function has become routine.

But the technique is subject to variable image quality and poor windows. The results tend to be qualitative, and quantitation can be difficult. Newer 3-D echocardiographic techniques address some of these issues, but such devices are not widely available.

Gadolinium-enhanced CMR is useful in determining if cardiomyopathy is ischemic or nonischemic. Studies have also shown the value of enhanced CMR as a marker in late-stage myocarditis, hypertrophic cardiomyopathy, amyloidosis, sarcoidosis, and Chagas disease.

Dr. Kramer noted that echocardiography is useful in several circumstances, especially for diastolic function and when "quick and easy" is adequate, but CMR is best for regional systolic function, for differential diagnosis and tissue characterization, and when quantitation is needed and 3-D echo is unavailable. ■

Echo Score Helps to Predict Survival in Post-MI Patients

BY ROBERT FINN
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SAN FRANCISCO — Echocardiography provides a great deal of information to help determine a patient's risk following a myocardial infarction, Dr. Thomas Ryan said at a cardiovascular imaging conference sponsored by the American College of Cardiology.

"There are a lot of ways we can [risk stratify patients], but I think our goals should be to do it in the most efficient, the most effective, and the most cost-responsible fashion possible," said Dr. Ryan of Duke University, Durham, N.C

Echocardiography provides a variety of perspectives on left ventricular function. It allows for a calculation of ejection fraction. Doppler plus the principle of continuity of flow allows for the measurement of stroke volume across both valves, which in turn allows for the calculation of cardiac output. The contour of the mitral regurgitation depth can be used to measure the rate of change in left ventricular pressure (dP/dt). And finally, one can generate a wall-motion score.

Together, the degree of left ventricular dysfunction and the presence and severity of mitral regurgitation are the most powerful predictors of early risk after acute MI. The results of a study of more than 3,000 patients in the Duke database show that an echo score derived from these two factors neatly stratifies patients into three categories.

Patients get no points for a good ejection fraction or good mitral regurgitation. They get 2 points each for poor ejection fraction and poor mitral regurgitation, and they get 1 point each for intermediate values. The echo score is the sum of the ejection fraction and mitral regurgitation scores.

Patients with an echo score of 0 have better than 90% 2-year survival. Those with an echo score of 3 or 4 have about a 50% 2-year survival, and those with a score of 1 or 2 have about a 75% 2-year survival.

Diastolic function has prognostic implications as well. If the deceleration time of the mitral P wave is 115 milliseconds or more, then the 30-month survival is 100%. Those with mitral deceleration times of less than 115 milliseconds have a 30-month survival rate of about 40%.

The combination of these measures means that the physician will get a great deal of information even before resorting to stress echocardiography. ■