MDCT, Thallium-201 Perfusion Scan, Stress Echocardiography, Which is Better?

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Chest pain is the most common presenting symptom of coronary artery disease (CAD). Patients presenting to the emergency department with chest pain have a common problem. Definitive diagnosis at presentation is difficult due to limitations of the initial evaluation, and, thus, the majority of patients are admitted. The assessment and appropriate management of patients with acute chest pain and nondiagnostic electrocardiograms (ECGs) remain a continuing clinical problem, with major logistic and financial implications for health-care providers. Recognition of these limitations has driven the investigation of alternative evaluation techniques and protocols to attempt to improve diagnostic sensitivity without increasing overall costs. Cardiovascular imaging is at the forefront of health care, experiencing rapid changes over the recent years, particularly with the use of advanced medical technologies. Imaging techniques like myocardial perfusion imaging (MPI), echocardiography, electron beam computed tomography (CT), and multi-detector CT (MDCT) have been used recently in the evaluation and triage of patients with chest pain in addition to the conventional investigations such as ECGs and cardiac biomarkers in the chest pain units. The high negative predictive value of a normal resting MPI in patients with chest pain for myocardial infarction and future cardiac events is well established. Echocardiography is also considered to be useful but the technique is operator dependent and at present there is insufficient data to support its use. There has been increasing interest in MDCT recently, especially with the advent of 64-slice CT but the sensitivity and specificity in chest pain patients are no better than MPI so far.

Over the past 20 years the mortality due to CAD has decreased, probably owing to more aggressive approaches in modifying risk factors and development of better therapeutic strategies. Nonetheless, the incidence of heart failure is dramatically increasing, making it the leading cause of hospitalization of patients in the age group over 65 years in developing countries. In approximately two-thirds of patients with left ventricular systolic dysfunction, coronary artery disease is the main cause of death. Thus, the best strategy to prevent heart failure would be to allow for optimized coronary perfusion via salvage of the ischemic but viable tissue trough medical or surgical interventions. Detection of viable myocardium in patients with left ventricular dysfunction has become an increasingly important guide to prognosis and treatment. This talk will also review the current status and future potential for the application of modalities to assess myocardial viability. Imaging that are reviewed are myocardial perfusion imaging by thallium-201 single-photon-emission computed tomography, stress echocardiography, and MDCT.