Continuing Medical Education Article

Risk Assessment and Predictive Value of Coronary Artery Disease Testing

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Disclosure

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Target Audience

Cardiac imagers, including nuclear medicine, cardiologists, and radiologists.
Objectives

Readers of this review should be able to:

1. Understand the concordance and discordance of myocardial ischemia and anatomic coronary artery disease.
2. Comprehend the expected cardiac event rates on the basis of the extent and severity of myocardial perfusion abnormalities.
3. Comprehend the expected 1-year event rates on the basis of the extent and severity of anatomic coronary artery disease visualized by coronary CT angiography.
4. Understand the clinical value of serial testing for evaluation of the ischemic burden in patients with stable ischemic heart disease.

Questions

1. A normal stress perfusion result obtained with $^{82}$Rb PET or SPECT is associated with which of the following average annual cardiac event rates?
   
   A. 3%.
   
   B. <1%.
   
   C. 5%.

2. $^{82}$Rb PET provides improved detection for which of the following at-risk patients?
   
   A. Obese patients with a body mass index of $\geq 30$ kg/m$^2$.
   
   B. Patients with a prior indeterminate SPECT result.
   
   C. Patients with 3-vessel or left main CAD.
3. The addition of a CAC score may prove beneficial for patients with which of the following likelihoods of CAD?
   A. Low.
   B. Intermediate.
   C. High.

4. Generally, cardiac event rates determined with myocardial perfusion SPECT and PET have been reported to be which of the following?
   A. Similar.
   B. Higher.
   C. Lower.

5. Discordant results for perfusion ischemia and anatomic CAD may be observed under which of the following circumstances?
   A. Collateral flow distal to a stenotic lesion.
   B. Dampened coronary flow reserve in arterial segments with nonobstructive atherosclerosis.
   C. Soft-tissue attenuation in the setting of no obstructive CAD.
   D. All of the above.
6. To interpret serial myocardial perfusion test results for the evaluation of ongoing CAD management, which of the following should be true?
   
   A. Stress types (i.e., exercise stress and pharmacologic stress) may be discordant.
   B. Patient must be on medications at the time of the repeat scan.
   C. Imaging modalities may be discordant (i.e., stress echocardiographic wall motion for ischemia may be correlated with myocardial perfusion results).
   D. Improvement in the percentage of ischemic myocardium by 1% or more signifies clinical improvement.

7. The negative predictive value of CCTA is which of the following?
   
   A. Low.
   B. Intermediate.
   C. High.
   D. Indeterminate.

8. High-risk anatomic CAD includes subsets of patients with which of the following conditions?
   
   A. Left main coronary artery stenosis.
   B. Proximal left anterior descending coronary artery stenosis.
   C. Two- or 3-vessel CAD.
   D. All of the above.
9. The diagnostic specificity of myocardial perfusion SPECT may be improved by the addition of which of the following?

   A. Attenuation correction algorithms.
   B. Evaluation of lung uptake.
   C. Exercise stress versus pharmacologic stress protocols.
   D. Integration of heart rate and other hemodynamic parameters.

10. Which of the following statements is true?

   A. CCTA has a minimal correlation with invasive angiography.
   B. Stress myocardial perfusion PET has diminished diagnostic accuracy compared with SPECT.
   C. The interpretation of coronary artery stenosis on CCTA is improved for patients with extensive CAC.
   D. Serial interpretation of changes in ischemic burden is a method for evaluating the effectiveness of ongoing antiischemic therapeutic intervention.