

Increased Positive Prediction of Myocardial Ischemia on SPECT by Computed Coronary Tomography Angiography

Ariel Gutstein, Arik Wolak, Victor Cheng, Isaac Cohen, John Friedman, Louise Thomson, Sean Hayes, Dan S Berman

Taper Foundation, Imaging, Cedars-Sinai Medical Center, Medicine, Cardiology, David Geffen School of Medicine at UCLA, Los Angeles, California

Background: Previous studies have shown only a moderate positive predictive value of coronary computed tomography angiography (CCTA) for prediction of ischemia by single photon emission computed tomography (SPECT) when the criteria used is the presence of > 50% of luminal stenosis by CCTA.

Objective: We sought to explore the correlation between the number of stenotic vessels and the degree of luminal stenosis by CCTA on myocardial ischemia.

Methods: One hundred seventy two patients with no previous coronary disease underwent SPECT (prone and supine) after stress or adenosine infusion and CCTA (with Dual source CT, Siemens) within six months. Myocardial ischemia was considered to be present when the summed stress score ≥ 4 as assessed blindly by automated quantitative analysis. CCTA stenosis were graded blindly to SPECT results as 0-50%, 50-70%, 70-90% ,>90% of luminal stenosis (LS).

Results: Overall, Ischemia was present in 36/172 patients (20.9%). Ischemia was present in 17/120 patients (14%) for CCTA stenosis < 50%, in 18/52 patients (35%) with CTA stenosis > 50%, in 15/35 patients (43%) with CCTA stenosis > 70% and in 12/20 patients (60%) with CCTA stenosis > 90% (p<0.001for trend). Ischemia was present in 4/21(19%) patients with one vessel coronary disease (VCAD) > 70% LS, in 6/10 patients (60%) of patients with 2 VCAD > 70% LS and in 6/7 (86%) patients with 3 VCAD > 70% LS (p=0.002 for trend).

Conclusion: Increased degree of LS and number of stenotic vessels as assessed by CCTA predicts frequency of ischemia by SPECT.