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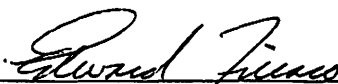
Diagnostic Accuracy of Attenuation Corrected Cardiac SPECT Perfusion Imaging
Edward P. Ficaro, Jeffrey A. Fessler, Paul D. Shreve, James N. Kritzman, Patricia A. Rose, James R. Corbett. University of Michigan, Ann Arbor, MI.

The purpose of this study was to assess the diagnostic performance of attenuation corrected (AC) Tc-99m sestamibi cardiac SPECT for the identification of coronary heart disease. Simultaneous transmission-emission tomography (TCT/ECT) was performed using a triple detector SPECT system on 60 patients with angiographic coronary disease and 59 patients with $\leq 5\%$ likelihood of coronary disease. Patients underwent pharmacologic or maximal exercise stress. Am-241 transmission data was obtained using a line source opposite a 65cm fanbeam collimator. Tc-99m emission data was collected with parallel hole collimators on the other detectors. Filtered-backprojection was used to reconstruct non-attenuation corrected(NC) images. An iterative reconstruction algorithm corrected the emission data for photon attenuation using the transmission data. The NC and AC images were filtered, resliced, visually and quantitatively analyzed. Integral areas A_z of the resulting ROC curves were computed for coronary stenoses $\geq 50\%$. From the low likelihood patients, the visual/quantitative normalcy rates increased from 0.88/0.76 for NC to 0.98/0.95 for AC ($p < 0.05$). For the detection of coronary artery disease, the visual A_z value increased from 0.734(NC) to 0.932 (AC, $p < 0.05$) demonstrating improved discrimination capacity for the AC images. Sensitivity/specificity values increased from 0.78/0.46(NC) to 0.84/0.82(AC) using visual analysis and from 0.84/0.46 (NC) to 0.92/0.82 (AC) for quantitative analysis. Similar increases were evident in the individual coronaries with the most significant increase seen in the specificity of the RCA (NC:0.46 vs AC:0.82, $p = 0.07$). Based on these initial clinical results, TCT/ECT cardiac perfusion imaging significantly improves the diagnostic accuracy of cardiac SPECT for the detection and localization of coronary heart disease. Clinical utilization of TCT/ECT imaging deserves careful consideration.

The author affirms that the abstract herein will not have been published* as a manuscript prior to presentation at the American Heart Association meeting or presented or published* as an abstract at any national meeting or world congress held in the United States, that any animal studies conform with the "Position of the American Heart Association on Research Animal Use" (*Circulation* 1985;71:849A), and that any human experimentation has been conducted according to a protocol approved by the institutional committee on ethics of human investigation or, if no such committee exists, that it conforms with the principles of the Declaration of Helsinki of the World Medical Association (*Clinical Research* 1966;14:103).

*An abstract containing previously published data may be presented at the Scientific Sessions *only* if the manuscript was submitted for publication after July 1, 1995.

The submitting author also certifies that all authors named in this abstract have agreed to its submission for presentation at the AHA Scientific Sessions and are familiar with the 10-author rule (see "Rules for Submission of Abstracts").



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