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**SCINTIGRAPHIC CORRELATES OF CHEST PAIN DURING ADENOSINE THALLIUM-201 MYOCARDIAL SCINTIGRAPHY****Ana Abreu, John J. Mahmarian, Shigeyuki Nishimura, Mario S. Verani, Baylor College of Medicine, Houston, Texas**

The purpose of this study was to assess the clinical significance of chest pain during adenosine thallium-201 scintigraphy. We studied 482 patients (255 males and 227 females, mean age  $67 \pm 11$  years, range 31 to 89), without evidence of recent myocardial infarction, who underwent adenosine stress thallium ( $140 \mu\text{g}/\text{kg}/\text{min} \times 6 \text{ min}$ ), because of suspected coronary artery disease. Chest pain occurred in 177 patients (36.7%), was of mild to moderate intensity in the majority of patients, and severe in only 4 patients. Perfusion abnormalities occurred in 72 of 177 (40.7%) patients with chest pain and in 126 of 305 (41.3%) patients without chest pain ( $p = \text{NS}$ ). Partial or complete thallium-201 redistribution occurred in 63 (35.6%) of the former and in 87 (38.5%) of the latter patients ( $p = \text{NS}$ ). Chest pain characteristic of angina occurred in only 62 patients (35% of those with chest pain and 12.9% of all patients), 46 of whom (74.2%) had perfusion defects and 39 (63%) had redistribution. In contrast, only 26 of 115 (22.6%) patients with atypical chest pain had perfusion defects, and 24 (20.9%) had redistribution ( $p < 0.0001$  vs patients with typical angina). Ischemic ST depression occurred in only 30 of 177 (16.9%) patients with chest pain, 21 of whom (70%) had perfusion defects and 17 (56.7%) had redistribution. In conclusion, although chest pain occurs frequently during adenosine infusion, it does not have the typical features of angina in most patients, and occurs often in the absence of ischemic ST depression or perfusion defects. These findings suggest a nonischemic origin for chest pain in most patients. Occurrence of typical angina during adenosine infusion, however, is predictive of myocardial hypoperfusion in the majority of patients, especially when accompanied by ischemic electrocardiographic changes.

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**IS THE SENSITIVITY OF DIPYRIDAMOLE TEST IMAGING ADVERSELY AFFECTED BY A SUBMAXIMAL CORONARY VASODILATION?****Alfredo R. Galassi, Luis I. Araujo, Adriaan A. Lammertsma, Yusuke Yamamoto, Cristhopher G. Rhodes, Terry Jones. MRC Cyclotron and Cardiovascular Units, Hammersmith Hospital, London, UK.**

Variable vasodilatory response to dipyridamole (D) may diminish the myocardial blood flow (MBF) contrast between regions supplied by non-stenotic arteries (N) and those supplied by stenotic artery (S) and thus decrease the quantitative diagnostic accuracy of perfusion agents such as  $^{201}\text{Tl}$ -thallium and  $^{99\text{Tc}}$ -MIBI. In order to characterize the MBF contrast obtained with D, we assessed MBF quantitatively in N and S using positron emission tomography (PET) and  $^{15}\text{O}$ -water. Measurements of MBF were performed in 13 patients (mean age  $56 \pm 8$  years) with single vessel disease, positive exercise test and no evidence of myocardial infarction before and after administration of  $0.6 \text{ mg}/\text{kg}$  of dipyridamole (D). MBF was measured in N and in S. During baseline (B), MBF in N was similar to that in S ( $1.02 \pm 0.24 \text{ ml}/\text{g}/\text{min}$  vs  $0.92 \pm 0.18 \text{ ml}/\text{g}/\text{min}$ ) while, following D, MBF was significantly higher in N than in S ( $3.10 \pm 1.22 \text{ ml}/\text{g}/\text{min}$  vs  $1.64 \pm 0.82 \text{ ml}/\text{g}/\text{min}$ ,  $p < 0.001$ ). A large inter-patient variability of MBF in N was also observed (from  $1.46 \text{ ml}/\text{g}/\text{min}$  to  $5.11 \text{ ml}/\text{g}/\text{min}$ ). This was not caused by a different haemodynamic response to D, as rate-pressure product following D did not correlate with MBF in N ( $r = 0.27$ ,  $p = \text{NS}$ ). However, the MBF ratio between S and N was  $0.53 \pm 0.15$  and this was unaffected by MBF after D in N ( $r = -0.10$ ,  $p = \text{NS}$ ). Thus, the marked difference in MBF in normal myocardial regions in subjects with coronary artery disease does not appear to influence the ratio of MBF between regions supplied by normal and stenotic arteries. This confirms that non quantitative assessment of MBF by perfusion scans is able to detect regions supplied by stenotic arteries even if a maximal vasodilatory capacity is not reached.

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**DIPYRIDAMOLE THALLIUM IMAGING FOR PROGNOSIS IN ELDERLY PATIENTS****Leslee Shaw, Thomas Hilton, Barbara Kong, Karen Stocke, Liwa Younis, Sheila Byers, Robert Buchanan, Robert D. Wiens, Dennis G. Caralis, Bernard R. Chaitman, St. Louis University School of Medicine, St. Louis, MO**

There are few data on the prognostic value of dipyridamole thallium imaging (DPI) in elderly patients (pts). In this report, we examine 322 pts  $\geq 70$  years who underwent DPI and were followed for  $23 \pm 15$  months. Of the 322 pts, 248 (77%) had known coronary artery disease. A normal (NL), fixed (FX), reversible (RV), or combined (CM) defect occurred in 139, 66, 61 and 56 pts. The percent of pts who developed a cardiac event after the DPI thallium scan defined as death, cardiac death, or the combined end point of death or MI is as follows:

$*p < 0.05$	NL vs Abnormal	NL	RV	FX	CM
Total death (n=72)	10%	25%*	38%*	34%*	
Cardiac death (n=45)	2%	19%*	23%*	31%*	
Death or MI (n=95)	13%	38%*	45%*	43%*	

The average number of abnormal thallium segments in 202 event-free survivors was  $1.7 \pm 2.4$  compared to  $3.4 \pm 2.5$  in 120 pts who had cardiac events ( $p = 0.0001$ ). In pts with a previous MI, 38% of pts with an abnormal scan developed a cardiac event compared to only 2% of pts with a normal scan ( $p = 0.0001$ ). In pts without previous MI, 18% of those with an abnormal test had death or MI during follow-up ( $p = 0.002$ ). Thus, in older pts incapable of exercising, an abnormal DPI is associated with an adverse outcome. DPI is a useful prognostic test to risk stratify older pts.

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**COMPARISON BETWEEN QUANTITATIVE ADENOSINE AND EXERCISE THALLIUM-201 TOMOGRAPHY: A MULTICENTER, CROSSOVER TRIAL****Shigeyuki Nishimura, John J. Mahmarian, Mario S. Verani, and the Adenosine/Exercise Multicenter Trial Investigators, Baylor College of Medicine, Houston, Texas**

A multicenter, crossover trial has been designed to compare two modalities of stress during thallium-201 scintigraphy: pharmacologic coronary vasodilation induced by exogenous adenosine (ADEN) and symptom-limited exercise treadmill testing (EX). A total of 150 subjects were enrolled, including 39 healthy volunteers (mean age  $32 \pm 7$  years) with less than 5% pre-test probability of having coronary artery disease (CAD) and 111 patients (mean age  $57 \pm 12$  years) who had suspected CAD. Both stress studies were performed in a randomized order, within  $13 \pm 13$  days of each other. All subjects underwent thallium-201 tomography using similar acquisition protocols and identical camera/computer systems. Quantitative polar plots were compared with normal data banks and interpreted by experts, without knowledge of the stress modality used. Interpretation agreement as to the presence of a perfusion abnormality between ADEN and EX thallium-201 scans was 86% (Kappa statistics = 0.709,  $p < 0.0001$ ). Agreement as to the presence of perfusion abnormality in each vascular territory was 90% for the left anterior descending (Kappa statistics = 0.635,  $p < 0.0001$ ), 85% for the right coronary (Kappa statistics = 0.551,  $p < 0.0001$ ) and 83% for the left circumflex artery (Kappa statistics = 0.472,  $p < 0.0001$ ). The extent of perfusion defects was  $18 \pm 14\%$  with ADEN and  $16 \pm 13\%$  with EX tomography ( $p = \text{NS}$ ) and correlated well with one another ( $r = 0.78$ ,  $p = 0.0001$ ).

Thus, pharmacologic coronary vasodilation using ADEN is as effective as exercise in inducing myocardial perfusion abnormalities detectable by thallium-201 tomography.