

Delayed Heart Rate Recovery After Treadmill Test: Comparison with Clinical, Exercise and Myocardial Perfusion Parameters

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Purpose: Imbalance autonomic nervous tone are fundamental risk factors for cardiac death. Recent studies reported abnormal heart rate recovery(HRR) after the treadmill exercise test is a powerful predictor of significant excess mortality. To evaluate HRR as an index of coronary artery disease(CAD), we have compared perfusion defect. **Methods:** 252 patients(147 men) underwent exercise myocardial perfusion imaging were included. The value for HRR was defined as the decrease in heart rate from peak exercise to 1 minute after termination of exercise. Myocardial perfusion imaging was acquired at 1 hour after 740MBq ^{99m}Tc-MIBI injection using dual head gamma camera(Vertex Plus, ADAC, USA). Summed stress score(SSS) and stress ejection fraction(sEF) were obtained from AutoQUANT program. 23 beats/min was defined as the lowest normal value for HRR. Patients were divided two groups: abnormal HRR(abHRR) and normal HRR(nHRR). We compared clinical(age, sex, previous CAD history, DM, HTN), exercise test(exercise capacity, duration) and myocardial perfusion parameters(SSS, sEF) between two groups. **Results:** Mean value of HRR was 50.814.2 beat/min. There were 25 patients(9.9%) with an abHRR. Patient with abHRR were generally in older age(61.59,2 vs 54.48,9yr), were more likely men(72 vs 56.8%), had a higher frequency of DM(16.7 vs 9%), HTN(52 vs 27.6%) and CAD history(28 vs 7%) compared to nHRR. In exercise and myocardial perfusion parameters, abHRR were showed more positive result(60 vs 30%), had short exercise duration(7.0±3.0 vs 9.1±2.7min) and small exercise capacity(7.2±2.3 vs 10.0±2.7Mets) compared to nHRR, had a higher frequency of CAD(76 vs 41.4%) and multivessel disease(25 vs 6.5%), had larger SSS(8.1±8.8 vs 3.7±6.3) and had smaller sEF(47.7±14.3 vs 57.9±10.3%) compared to nHRR. **Conclusion:** AbHRR was frequently found in patients with CAD, large myocardial perfusion defect and decreased LV function. It seems that the HRR may be considered a reliable index of the severity of CAD.

Reversible Wall Motion Abnormality on Adenosine Stress/Rest Thallium-201 Gated Myocardial SPECT is an Independent Predictor of Coronary Artery Disease

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Purpose: As early as 10 minutes after adenosine stress, immediate post-stress wall motion (ipsWM) can be evaluated on adenosine stress/rest Tl-201 gated SPECT (gSPECT). To widen application of Tl-201 in gated SPECT, we investigated image quality, LV parameters (EF, EDV, and ESV) reproducibility, and diagnostic competency of gSPECT regarding ipsWM evaluation. **Methods:** Myocardial perfusion and wall motion were evaluated by 5-point scoring system in 20-segment model. Image quality was assessed using weighted Kappa (Kw) for inter- and intra-observer agreements of wall motion scores (n=49). Reproducibility was examined through repeated acquisition (n=31). Diagnostic competency was evaluated versus coronary angiography (CAG) and multivariate logistic regression analysis was performed to identify significant predictors of coronary artery disease (CAD) among stress abnormal perfusion (SSSp), stress abnormal wall motion (SSSwm), and reversible abnormal wall motion (SDSwm) (n=60). **Results:** Kw for ipsWM was significantly better than that for rest regarding inter- (0.717 vs 0.489) and intra-observer agreements (0.792 vs 0.688) (p<0.05). 2SD for ipsWM was smaller than that for rest at EF (8.6% vs 10.7%) and ESV (6.0ml vs 8.4ml). Sensitivities of SSSp, SSSwm, and SDSwm were 63.3% (19/30), 63.3% (19/30), and 43.3% (13/30) and specificities 83.3% (25/30), 83.3% (25/30), and 86.7% (26/30), respectively. By multivariate analysis, SSSp (p=0.013) and SDSwm (p=0.039) remained significant predictors. Additionally, SSSwm or SDSwm could find undetected CAD in 54.5% (6/11) of patients with normal perfusion. **Conclusion:** Tl-201 can be successfully applied to gated SPECT for ipsWM evaluation. Moreover, reversible wall motion abnormality on gSPECT is an independent predictor of significant CAD.