IMAGING AND DIAGNOSTIC TESTING

DIAGNOSTIC UTILITY OF HEART RATE RECOVERY FOLLOWING A PEAK EXERCISE STRESS TEST IN THE ASSESSMENT OF DIABETIC CARDIAC AUTONOMIC NEUROPATHY

ACC Poster Contributions
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Background: Cardiac autonomic neuropathy (CAN) is associated with adverse outcome in pts with type 2 diabetes (T2D) and may be assessed using various clinical tests, although a gold standard method is lacking. This study determined the diagnostic accuracy of heart rate recovery (HRR) following a peak exercise stress test (EST) to detect CAN.

Methods: Pts with T2D (n=97, 599y, 60% men) and without CAD were assessed for CAN using current criteria of >2 abnormal findings from a clinical test battery comprising 4 cardiac reflex tests and 3 heart rate variability spectral parameters. HRR was defined by the reduction in HR from peak treadmill exercise and was measured at 60, 90, 120, 150 and 180 seconds post-exercise with the pt supine. The diagnostic accuracy of HRR was assessed by the area under an ROC curve (AUC). Optimal cutoff values were determined by the maximal Youden index (sensitivity + specificity - 1).

Results: CAN, identified in 18 (19%) pts, was associated with reduced HRR at all time points (p<0.001). AUC, optimal cutpoints for detecting CAN, sensitivity, specificity, accuracy, and positive (PPV) and negative (NPV) predictive values are displayed (Table). No differences in AUC were observed between HRR time points (p>0.05). Sensitivity of HRR at 60, 90 and 120 seconds was higher compared with measures at 150 (p=0.01) and 180 seconds (p=0.04).

Conclusion: HRR derived from a standard EST detects CAN with ~80% accuracy and may therefore be used to identify at-risk pts without positive ECG findings for CAD.

Recovery time (sec)	Optimal HRR cutpoint (bpm)	AUC	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Accuracy (%)
60	23	0.92	100	73	46	100	78
90	35	0.92	94	76	47	98	79
120	45	0.90	94	71	43	98	75
150	47	0.89	78	85	54	94	84
180	53	0.88	83	82	52	96	82