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Improving the Specificity of Exercise Testing in Women by High-Frequency QRS Analysis

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Background: Exercise testing (ETT) in women with suspected coronary artery disease (CAD) has limited specificity, leading to an excessive rate of unnecessary angiographies. Analysis of high-frequency QRS (HFQRS) components was recently shown to be more accurate than ST changes in identifying stress-induced ischemia, independent of gender. The aim of this study was to evaluate the diagnostic value of HFQRS in women referred to angiography.

Methods: Analysis was performed in 25 women (age 62±10 yo) referred to non urgent angiography, which served as the gold standard for comparison. Pts underwent ETT using the HyperQ system, which provides both conventional ECG and HFQRS signals. HFQRS diagnosis was determined by computerized analysis, measuring the stress-induced reduction in HFQRS intensity. The diagnostic performance of HFQRS was compared to ST segment analysis and clinical symptoms during ETT.

Results: Angiographically significant CAD was found in 13 pts (52%). Clinical ETT interpretation was abnormal in 22 pts and inconclusive in 3 pts. Ischemic ST changes and chest pain observed during exercise were sensitive but highly non-specific for CAD diagnosis (Table). HFQRS analysis provided significantly higher specificity of 83% ($P<0.05$ vs ST changes), with similar sensitivity of 77%.

Conclusions: HFQRS analysis improved the specificity of ETT in assessing CAD, while retaining high sensitivity. Thus, HFQRS may reduce the number of unnecessary angiography procedures in women.

	Sensitivity (N=13)	Specificity (N=12)	Accuracy (N=25)
HFQRS	77%	83%*	80%
ST changes	85%	25%	56%
Chest pain	77%	58%	68%
Clinical diagnosis	92%	17%	56%