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ECG in Atrial and Ventricular Arrhythmias

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Abstract 1741: Predicting Coronary Stenosis by Computer-Enhanced, Resting Electrocardiogram: Effect of Gender, Age, and Revascularization on Sensitivity and Specificity

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Background: Resting electrocardiogram (ECG) shows limited sensitivity and specificity for the detection of coronary artery disease (CAD). We wanted to evaluate a new computer-enhanced resting ECG device, 3DMP, for the detection of angiographically diagnosed coronary artery stenosis, and the effect of gender, age and prior revascularization on sensitivity and specificity.

Methods: A total of 758 patients (mean age 62 +/- 11) with or without previous coronary revascularization who were scheduled for coronary angiography were included in this prospective, observational study.

Angiographic results were classified into hemodynamically relevant (stenosis) and hemodynamically non-relevant (no stenosis) coronary lesions by two angiographers independently. The 3DMP device calculated a severity score ranging from 0 to 20 where a higher score indicated a higher likelihood of myocardial ischemia due to coronary stenosis. A score of greater than 4 was defined as indicative of hemodynamically relevant coronary stenosis.

Results: Overall 87.1% of all cases were correctly classified. Logistic regression showed a statistically significant effect of sex and a slight, but not significant effect of previous revascularization on the performance of 3DMP (details in table).

Conclusion: While performance of 3DMP is influenced by gender and marginally by revascularization, this new computer-enhanced, resting ECG device provides high sensitivity and specificity for the identification of angiographically confirmed coronary stenosis in all investigated patient groups. The high negative predictive value in patients after revascularization may make this device especially useful for screening in this patient population.

Prediction of coronary stenosis by severity score (cut-off 4.0) for different patient groups

Patient groups	N	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Correctly Classified	Receiver Operating Characteristics AUC
Total	758	0.890	0.856	0.818	0.915	0.871	0.873
Female	277	0.893	0.881	0.765	0.950	0.884	0.880
Male	481	0.889	0.837	0.839	0.888	0.863	0.869
< 65 years	433	0.880	0.885	0.820	0.912	0.875	0.892
65+ years	325	0.923	0.812	0.817	0.920	0.865	0.838
No Revascularization	545	0.879	0.842	0.823	0.893	0.859	0.857
PCI	147	0.878	0.906	0.783	0.950	0.898	0.907
CABG	66	1.000	0.833	0.833	1.000	0.909	0.891

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