CHEST For specialists in: Pulmonology, Critical Care, Sleep Medicine, Thoracic Surgery, Cardiorespiratory Interactions, and related disciplines
Abstract | Volume 132 | Number 4 | October 2007 Supplement to Chest, Page 466S

**Computerized resting ECG analysis for the detection of coronary artery stenosis after coronary revascularization in comparison with angiographic findings**

Michael Imhoff, MD PhD; Andreas Bootsveld, MD; Joseph T. Shen, MD; Seyrani Yuecel, MD; Eberhard Grube, MD PhD FACC FACA

**Purpose**: To evaluate a new computerized ECG system for the detection of myocardial ischemia due to hemodynamically relevant coronary re-stenosis, de novo stenosis, or graft stenosis after revascularization.

**Methods**: 213 patients (68 female, mean age 63.9 +/- 9.8) were included who were scheduled for follow-up angiography after coronary revascularization at least 6 weeks before inclusion (147 PCI, 68 CABG). 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**: For patients with coronary stenosis the severity score was significantly higher than without (5.4 +/- 1.9 vs. 1.7 +/-2.1; $p < 0.001$, t-test). With a cut-off score of 4.0 3DMP correctly classified 192 patients (90.1% correct; sensitivity 93%, specificity 88.7%). Positive and negative predictive values were 80.5% and 96.2% respectively. The ROC area under the curve for the continuous severity score was 0.909 (95% CI: 0.867-0.952). The performance was not significantly different between patients with PCI and those with CABG (ROC AUC 0.907 [0.852-0.961] vs. 0.891 [0.803-0.978]).

**Conclusions**: 3DMP provides a resting ECG methodology, which appears to be very sensitive and specific in the identification of patients with coronary stenosis after coronary revascularization. These results warrant additional studies with a direct comparison other non-invasive methods.

**Clinical Implications**: 3DMP may be a valuable tool for diagnosing and screening patients who have undergone coronary revascularization for re-stenosis, de novo stenosis, or graft stenosis. As a resting ECG method 3DMP may be especially advantageous when stress test methods are contraindicated.