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Abstracts
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2005

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Dallas Texas

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basic science



clinical science



population science

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2005 Russell Ross Memorial Lectureship in Vascular Biology • 2005 George Lyman Duff Memorial Lecture • 2005 Sol Sherry Distinguished Lecture in Thrombosis • 2005 Thomas W. Smith Memorial Lecture • 2005 George E. Brown Memorial Lecture • 2005 Dickinson W. Richards Memorial Lecture • 2005 Katharine A. Lembright Award • 2005 William W. L. Glenn Lecture • 2005 William J. Rashkind Memorial Lecture • 2005 Alexander S. Nadas Memorial Lecture • 2005 Charles T. Dotter Memorial Lecture • 2005 Laennec Society Lecture • 2005 James B. Herrick Award and Lecture • 2005 Ancel Keys Lecture • 2005 Lewis K. Dahl Memorial Lecture • 2005 Robert I. Levy Memorial Lecture • 2005 Stroke Council Award and Lecture

New and Young Investigator Award/Prize Abstract Finalists

Lewis N. and Arnold M. Katz Basic Science Research Prize for Young Investigators • Melvin L. Marcus Young Investigator Awards in Cardiovascular Science • Cournand and Comroe Young Investigators Prizes in Cardiopulmonary and Critical Care • Outstanding Research Award in Pediatric Cardiology • Melvin Judkins Young Investigator Award in Cardiovascular Radiology • Vivian Thomas Young Investigator Award • Martha N. Hill New Investigator Award • Elizabeth Barrett-Connor Research Award in Epidemiology and Prevention for Investigators in Training • Samuel A. Levine Young Clinical Investigator Awards • Laennec Society Young Clinician Award • NPAM New Investigator Award

Abstracts From the Scientific Sessions 2005

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Modulation of Ventricular Repolarization in Patients with Stress Induced Transient Left Ventricular Apical Ballooning: A Case Control Study

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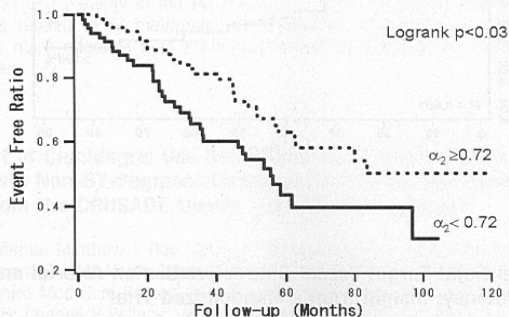
Transient left ventricular apical ballooning (AB), an emerging syndrome that mimics acute ST-segment elevation myocardial infarction (MI), is characterized by reversible left ventricular wall motion abnormalities in the absence of obstructive coronary heart disease due to sympathetic hyperactivity. Even though diffuse T-wave inversion and prolongation of the QT-interval in the surface ECG have been consistently reported, ventricular repolarization has not yet been systematically investigated in this clinical entity. **Methods and Results:** We prospectively enrolled 22 consecutive patients (21 women, median age 65 years) with transient left ventricular AB. A total of 22 age-, gender-, body mass index- and left ventricular function-matched patients with acute anterior ST-segment elevation MI undergoing successful direct percutaneous coronary intervention for a proximal occlusion of the LAD served as a control group. Beat-to-beat QT-interval and QT-interval-dynamicity were determined from 24-hour-Holter-ECGs, recorded on the third day after hospital admission. There were no significant differences in baseline clinical characteristics, except higher peak enzyme release in MI patients. Patients with transient AB exhibited significantly prolonged mean QT-intervals and rate corrected QT-intervals (QT: 418 ± 37 vs. 384 ± 33 , $p < 0.01$; QTcBazett: 446 ± 40 vs. 424 ± 35 , $p < 0.05$; QTcFridericia: 437 ± 35 vs. 412 ± 31 , $p < 0.05$). Mean RR-intervals tended to be higher in AB patients, without reaching statistical significance (877 ± 96 vs. 831 ± 102 , $p = NS$). The linear regression slope of QT-intervals plotted against RR-intervals was significantly flatter in AB patients at day- and nighttime (QT/RR-slope day: 0.18 ± 0.04 vs. 0.22 ± 0.06 , $p < 0.01$; QT/RR-slope night: 0.12 ± 0.03 vs. 0.17 ± 0.05 , $p < 0.01$). **Conclusion:** This study is the first to demonstrate significant differences of QT-interval modulation in patients with transient AB and acute ST-segment elevation MI. Even though transient AB is associated with a significant QT-prolongation, rate adaptation of ventricular repolarization (ie. QT dynamicity) is not significantly altered, suggesting a differential effect of autonomic nervous activity on the ventricular myocardium in transient AB and in acute MI.

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Prognostic Value of Nonlinear Heart Rate Dynamics in Patients with Chronic Atrial Fibrillation

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Introduction: Heart rate variability (HRV) is useful for evaluating prognosis of cardiovascular disease in patients with sinus rhythm. However, the clinical value of HRV in atrial fibrillation (AF) has not been fully evaluated. The purpose of this study was to evaluate the prognostic power of new fractal measures of HRV as predictors of cardiovascular events. **Hypothesis:** Fractal HRV is useful for predicting cardiovascular events in patients with chronic AF. **Methods:** Time and frequency domain HRV measures, along with power-law scaling of the power spectra (slope), short- and long-term correlation (fractal) properties of R-R intervals (exponents α_1 and α_2) by detrended fluctuation analysis (DFA) were assessed from 24-hour Holter recordings in 146 patients with chronic AF (age 66 ± 10 yrs, male 95, female 51). **Results:** Sixty-one patients (42%) had cardiovascular events during follow-up (47 ± 30 months). After adjusting for other risk markers, a significant association with cardiovascular events was found in the slope and α_2 (relative risk 1.27 and 0.67; 95% [CI], 1.04 to 1.56, $p < 0.02$ and 0.50 to 0.91, $p < 0.01$, respectively), whereas time and frequency domain HRV measures did not associate with cardiovascular events. A lower α_2 (< 0.72) was a significant predictor of cardiovascular events. Estimated cumulative rate against cardiovascular events over 8 years was 70.2% in patients with an $\alpha_2 < 0.72$ and 49.8% in those with an $\alpha_2 \geq 0.72$. **Conclusions:** Use of fractal measurements of HRV with slope and α_2 were powerful predictors of cardiovascular events in chronic AF.



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Identification of Genotype-Specific Repolarization Patterns in Congenital Long-QT Syndrome Using Dynamic Time Warping Analysis

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Congenital Long-QT Syndrome (LQTS) is a group of cardiac channelopathies resulted from mutations of encoding ion channel genes and is characterized by QT prolongation, gene-

specific ST-T abnormalities and increased vulnerability to life-threatening ventricular arrhythmias. Genotype determination is important for diagnosis and therapeutic strategies. However, it is still a time consuming process. Visual recognition of LQT1-3 ST-T wave patterns has been successfully used to predict the common LQTS genotypes by experts. To date, no objective analytic method has been validated for that purpose. In this study, we used a novel method of pattern recognition, Dynamic Time Warping (DTW), for detecting genotype specific ST-T wave patterns in LQT1-3 patients. **Methods:** Total of 57 genotyped LQTS (31 LQT1, 21 LQT2, and 5 LQT3) patients were included in this study. We digitized the JT intervals of the 12 lead-ECGs on all of these patients. We applied DTW to the digitized data. Previously reported templates for typical ST-T wave patterns of each LQTS genotype is used for pattern-matching. **Results:** DTW analysis was able to identify the genotype-specific patterns with an overall sensitivity of 81%. Sensitivity/specificity values were as follows for each genotype: 94% / 69% for LQT1, 71% / 94% for LQT2, and 40% / 98% for LQT3. Positive and negative predictive values were as follows: 78% / 90% for LQT1, 88% / 85% for LQT2, and 67% / 94% for LQT3. **Conclusion:** DTW has a potential as a novel pattern recognition method in identification of genotype-specific repolarization patterns in LQTS. Identification of genotype-specific patterns might enhance the ECG diagnosis of LQTS and facilitate the genotype testing by targeting specific genes.

Cardiac Surgery: Outcomes After Coronary Artery Bypass

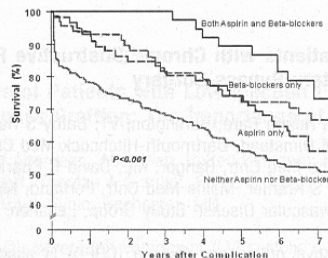
Subspecialty: Coronary Artery Disease/Valve/CV Surgery
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Long-Term Survival after Cardiac Bypass Surgery: Impact of Acute Intervention and Secondary Prevention Strategies

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Background: No acute treatment or long-term secondary prevention strategy has been identified for patients suffering myocardial infarction or congestive heart failure after myocardial revascularization. **Methods:** At 24 centers we prospectively studied 2,417 patients undergoing revascularization assessing ischemic events (MI, CHF, dysrhythmia), and patients over the decade after discharge. **Results:** Twenty-percent (474 patients) suffered ischemic events, increasing in-hospital death (odds ratio, 15.60; $P < 0.001$) and long-term death (odds ratio, 2.68; $P < 0.001$). Multivariate analysis identified only two potentially reversible, independent predictors for long-term event survival: use of aspirin (odds ratio for death, 0.66; 95 percent confidence interval, 0.46 to 0.95) and use of beta-blockers (odds ratio, 0.58; 95 percent confidence interval, 0.38 to 0.86) over the decade after event. However, only 16 percent ($n = 74$) received both therapies after the in-hospital event, with the majority (54 percent; 243 patients) receiving neither therapy. No patients receiving both died in-hospital versus 18 percent (44 patients) dying among those receiving neither ($P < 0.001$). Similarly, long-term mortality was significantly reduced by 48 percent ($P < 0.01$), from 47 percent (neither) to 24 percent (both) (Figure). **Conclusions:** The combination of aspirin and beta-blockers for acute treatment and long-term secondary prevention is associated with improved survival over the first decade following myocardial revascularization. However, few patients suffering these complications despite being hospitalized and intensively monitored are treated with these therapies.



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Improving Process and Outcomes in Very High-Risk Patients Undergoing Coronary Artery Bypass Graft Surgery: Prospective Use of EuroScore to Enhance Pre-Operative Clinical Decision-Making and Improve Clinical Outcomes

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Background: Increasingly, high-risk patients comprise a growing percentage of cardiovascular (CV) patients referred for coronary artery bypass graft (CABG) surgery in the U.S., and it is essential to put in place systems and processes of care that ensure continuous quality improvement (CQI) and optimal clinical outcomes in these patients. **Methods:** We established a prospective, pre-operative CQI initiative to facilitate clinical decision-making among cardiologists and cardiac surgeons referring patients for high- CABG surgery using a