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Magnetic Dispersion at the Peak of T-wave Predicts Prognosis in Patients with Acute Myocardial Infarction

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Introduction: Magnetocardiography (MCG) has been proposed as a noninvasive diagnostic tool to risk-stratify patients with acute myocardial infarction (AMI) and ischemia. However, it is not revealed whether MCG could predict the prognosis in patients with AMI. This study was performed to find MCG parameters, which could predict the prognosis in patients with AMI. **Method:** We enrolled 124 patients (29 female, mean age 60±11 years), including 91 non-ST elevation MI and 33 ST elevation MI. The MCG recordings were obtained within 2 days after AMI using a 64-channel MCG system in a magnetically shielded room. The patients were subgrouped according to the major adverse cardiac events (MACE) including death, AMI, and percutaneous coronary intervention (PCI) during follow up period. The MCG parameters were evaluated from QRS to the end of T wave (Te), and compared between patients without (group 1) and with MACE (group 2). **Result:** Left ventricular ejection fraction was 51.9±13.3%. The number of patients managed by PCI, bypass surgery and medical therapy was 103(83%), 13(10.5%), and 8 (6.5%), respectively. During the mean follow up duration of 40.3±19.9 months, MACE occurred in 24 (19.3%) patients including 6 deaths, 2 MIs, and 17 revascularizations. In total patients, non-dipole pattern were commonly observed from Te to 40 ms before Te in 85 (68.5%) patients. While 19 (79%) showed non-dipole pattern at the T-peak in group 2, 56 (56%) patients showed non-dipole pattern in group 1 ($p=0.04$). Mean number of poles at the T-peak was also higher in patients with MACE than without MACE ($3.2±0.8$, vs. $2.8±0.9$, $p=0.03$). Maximum current, field map angles and pole distance were not different between 2 groups. In multiple logistic regression, the non-dipole pattern at T-peak (OR=3.2, 95% CI 1.03 to 9.87, $p=0.04$) was an independent prognostic factor of AMI. **Conclusion:** The magnetic dispersion was commonly observed from Te to 40 ms before Te in AMI patients. However, it was observed at the T-peak in only AMI patients with poor prognosis. This finding suggests that MCG might be used to diagnose the repolarization dispersion produced by ischemia and predict the prognosis in AMI.

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Which one is more important in prognosis between carotid intima-media thickness and carotid plaque?

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Background: Carotid intima-media thickness (CIMT) and plaque are both important in primary prevention. However, it is still unclear which one is more important in prognosis in patients with coronary artery disease (CAD). **Methods:** The study population, consists of 1473 consecutive patients with CAD, was followed up for a mean of 40.7 months. Study population was divided into 4 groups according to the CIMT (0.78mm, median value) and the presence of carotid plaque. **Results:** Patients with plaque and thick CIMT ($n=309$, 21.0%) were older and had higher prevalence of hypertension and diabetes mellitus than those with plaque and thin CIMT ($n=140$, 9.5%), those without plaque and thick CIMT ($n=429$, 29.1%) and those without plaque and thin CIMT ($n=595$, 40.4%). In univariate analysis, patients with plaque and thick CIMT had higher mortality (8.1% vs. 5.7%, 2.1% and 2.0%, respectively, $p<0.001$), restenosis (15.2% vs. 12.1%, 12.4% and 5.4%, respectively, $p<0.001$), hospitalization for congestive heart failure (4.5% vs. 2.1%, 2.3% and 1.0%, respectively, $p=0.005$) and total MACE (35.0% vs. 27.1%, 22.6% and 12.3%, respectively, $p<0.001$) than other groups. Cox regression analysis showed that the independent predictors of total MACE were carotid ultrasound findings (HR 1.46, 95% CI 1.276 to 1.549, $p<0.001$) and diabetes mellitus (HR 1.360, 95% CI 1.066 to 1.736, $p=0.013$). **Conclusion:** Carotid ultrasound findings are important predictor in patients with CAD. Presence of carotid plaque is more important than CIMT in prognostic power.

