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Abstracts Issue



WORLD HEART
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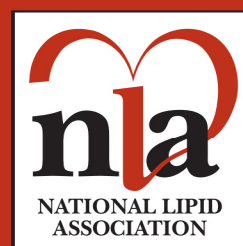


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Workshop 17 "IMAGING"

3:45 PM - 5:30 PM

Chairs: E. Tremoli, Milan, Italy and Z.A. Fayad, New York, NY, USA.

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MULTIMODALITY (PET/CT, MR, AND CT) IMAGING OF THE ATHEROSCLEROTIC PLAQUE: IMPLICATIONS FOR NEW REGRESSION CLINICAL TRIALS

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Atherosclerosis is an inflammatory disease, where the degree of inflammation, not the plaque size, determines risk of rupture and therefore likelihood of a clinical event. Magnetic Resonance Imaging (MRI) can image atherosclerotic plaque with high resolution, and several MRI parameters of disease extent in the carotid arteries and aorta have been shown to correlate with atherosclerotic risk factors. Dynamic-contrast-enhanced MRI (DCE-MRI) is a new technique for the study of plaque composition. In this study, the extent of plaque inflammation determined by FDG uptake was correlated with DCE-MRI. By providing a metabolic image of macrophage activity, F18-Fluorodeoxyglucose (FDG) positron emission tomography (PET) can image atherosclerotic plaque inflammation in patients and in animal models of disease, with a strong correlation between FDG uptake and plaque macrophage content. In addition, autoradiography has confirmed that the FDG signal originates from activated macrophages within the lipid core and fibrous cap of the plaque. This has led to the suggestion that FDG-PET might have a role in identifying 'high risk' plaques and monitoring their response to therapy. Computed tomography (CT) can be used in conjunction with PET to help co-register the PET images and for attenuation corrections. Moreover, CT with its exquisite coronary imaging has the potential to address atherosclerosis in the vessel wall of the coronary arteries. We review in this talk to use of multimodality imaging (MR, PET, and CT) for the study of inflammation of vessel wall may be useful in assessment of plaque vulnerability.

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CAROTID INTIMA MEDIA THICKNESS AS MARKER OF ATHEROSCLEROSIS: RESULTS OF THE IMPROVE STUDY

Elena Tremoli, Damiano Baldassarre. University of Milan, Milan, Italy; Monzino Cardilogic Center, Milan, Italy.

The intima-media thickness (IMT) of extracranial carotid arteries, measured by high-resolution B-mode ultrasound has been proposed as an useful surrogate marker of atherosclerosis in carotid arteries and in other vascular regions. IMT is a good predictor of new myocardial infarction and it has been shown to be influenced by drugs known to reduce cardiovascular events, which supports the concept that IMT represents a biomarker of atherosclerosis. Carotid IMT alone has the same predictive capacity of VRFs. In a longitudinal - observational study, we have shown that the integrated use of VRFs included into the Framingham risk score and ultrasonic measurements of carotid IMT significantly increase their capacity to predict cardiovascular events in patients at low/intermediate risk. The integration of carotid IMT with non conventional VRFs may further optimize the stratification of patient risk. Another important carotid ultrasonic variable that may have predictive capacity, alone or when integrated with conventional or non conventional risk factors, is the progression of carotid IMT. A prospective, multicenter, longitudinal, long-term, observational study (The IMPROVE study) is currently ongoing. It aims to investigate the capacity of both cross sectional carotid IMT and overall IMT-progression to predict alone, or after integration with both conventional and non conventional VRF, the rate of new vascular events in an European population classified at high risk of cardiovascular disease for the presence of at least 3 VRFs. The patients' enrolment ended in April 2005 and a total of 3711 patients were recruited in 6 European countries.

Funding: Italian Ministry of Health, European Commission, IMPROVE project