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Journal of Cardiology & Current Research

Editorial

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Role of carotid intima-media thickness in the detección of subclinical atherosclerosis

Volume 4 Issue 1 - 2015

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Received: November 17, 2015 | **Published:** November 18, 2015

Keywords: carotid intima-media thickness, subclinical atherosclerosis, risk marker

Editorial

Atherosclerosis is a systemic disease process that affects the arterial tree of the human body when it is exposed to elevated risk factor levels.[1–3] Carotid intima media thickness (IMT) is a measure of early atherosclerosis and vascular remodelling that can be rapidly and non-invasively assessed with high-resolution ultrasound. Indeed, carotid IMT is widely utilized because it can be measured relatively simply, non-expensibly, and it is commonly utilized to investigate atherosclerosis.[4–6] Increased carotid IMT is considered to represent a manifestation of subclinical atherosclerosis and it has been included in the European hypertension guidelines,[7] and in the European prevention guidelines.[8] The ultrasound technique measurement of carotid IMT is stated in the ACC/AHA 2010 guidelines as a tool for cardiovascular risk assessment in appropriately selected patients. Hence, assessment of carotid IMT has emerged as a simple and noninvasive technique for measuring atherosclerotic burden.[9]

In addition, in order to study the efficacy of pharmacological interventions in clinical trials, drug-induced regression or slow progression in carotid IMT in the follow-up period are being used as an alternative, or surrogate clinical end point for cardiovascular morbidity and mortality.[1] Serum biomarkers have been widely utilized to assess the risk of developing atherosclerosis. Despite their benefits and their usefulness in this context, carotid IMT has the additional theoretical advantage of directly visualizing the final consequence of the disease itself, namely atherosclerosis in the vessel wall. The current widespread application of the ultrasound values of carotid IMT measurements has been based on the validity, standardization, and reproducibility of the technique, and the evidence that an increased carotid IMT can be regarded as a marker of atherosclerosis and of increased cardiovascular risk.[10–16] This harmless ultrasound procedure has several advantages due to the lack of invasiveness and its usefulness of repeatability which makes carotid IMT measurement an attractive biomarker, potentially useful as a therapeutic target in those at increased cardiovascular risk.[17]

Despite major improvements performed in the therapeutic management of acute coronary syndromes decreasing its morbidity and mortality, it still remains as the number one cause of death in the world.[18–22] This highlights the necessity to close the gaps that are left between risk assessment with traditional risk factors and the real clinical event. Evidence based medicine relies on clinical data from randomized controlled trials to guide therapeutic clinical decisions. Carotid IMT can be considered as a biomarker halfway between risk factors and organ damage that can help prevent clinical events. This approach avoids the substantial costs and lengthy follow-up required of traditional clinical trials that are focused on hard, but uncommon, clinical end points such as myocardial infarction, stroke, or death.[11–13]

Although, ultrasound measurement is a well-validated technique that has undergone substantial technical improvements in both the manner of imaging and the IMT quantification, it is still a limited imaging modality for assessing carotid atherosclerosis. Newer non-invasive techniques such as magnetic resonance imaging have attractive properties that may improve the assessment of atheroma burden in this vascular territory.[23] Carotid magnetic resonance imaging has already begun to be used for evaluating the artery wall changes associated with pharmacological treatment.[24–28] The proper utilization of carotid resonance may lead to more accurate quantification of atherosclerotic burden and improve the correlation of IMT changes with clinical events. Anyway, regardless of the technique utilized to perform the measurements, carotid IMT measurements have increasingly been used in observational and interventional clinical studies. Carotid IMT has been applied as an outcome variable in studies on the determinants of atherosclerosis, and it has been employed as a biomarker in order to predict coronary artery disease and stroke. Change in carotid IMT over time as an indicator for atherosclerosis progression, has predominantly served in interventional studies as a primary outcome variable aimed at assessing the effects of risk factor interventions.

Acknowledgments

None.

Conflicts of interest

Author declares there are no conflicts of interest.

Funding

None.

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