PATIENTS WITH DIABETES MELLITUS AND CORONARY ARTERY DISEASE EXHIBIT HIGHER CAROTID ATHEROSCLEROTIC PLAQUE INFLAMMATION: INSIGHTS FROM A NEW NONINVASIVE METHOD

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Background: Although patients with diabetes mellitus (DM) are more prone to stroke than non-DM patients, similar carotid plaque ultrasound characteristics and distributions have been shown in both groups. However, inflammation that is implicated in the progression of atherosclerosis seems to be pronounced in patients with DM. The aim of this study was to evaluate the impact of DM on morphological and functional carotid artery characteristics in patients with documented coronary artery disease (CAD).

Methods: Consecutive patients (n=300) with significant CAD documented by coronary angiography were evaluated by: 1) ultra-sound echo-color Doppler (US-ECD) study of both carotid arteries, and 2) microwave radiometry (MR), a new noninvasive method, which allows the in vivo measurement of the internal temperature of tissues reflecting local inflammation. Carotid plaques were identified as focal intima-media thickening ≥1.2mm. ΔT by MR was defined as the maximum temperature difference of both carotid arteries. Vessel- and patient based analysis were performed to determine the impact of DM on morphological and functional carotid artery characteristics.

Results: Hundred-thirteen patients had DM (37.7%). Carotid plaques were identified in 235 patients and 390 carotid arteries (65%). Patients with DM had similar carotid intima-media thickness in both vessel- and patient-based analysis (0.85±0.18 versus 0.86±0.21mm, p=0.83; 0.95±0.17 versus 0.94±0.17 mm, p=0.62, respectively). Patients with DM had similar carotid plaque thickness in both vessel- and patient-based analysis (1.92±0.99 versus 2.08±1.13mm, p=0.08; 2.22±0.99 versus 2.48±1.26mm, p=0.07, respectively). Interestingly, patients with DM exhibited higher ΔT in both vessel- and patient-based analysis (0.85±0.50°C versus 0.74±0.46°C, p=0.007; 1.03±0.51 versus 0.91±0.46°C, p=0.03, respectively).

Conclusion: Functional abnormalities may be more profound to structural changes in patients with non-significant carotid plaque stenosis and DM. The impact of these functional carotid artery characteristics on patient prognosis still remains to be elucidated.