Multiple Biological Predictors for Vulnerable Carotid Lesions

Background: In this study a multiscore analysis of various biomarkers including matrix metalloproteinases (MMPs), inflammatory factors and other clinical parameters was performed to establish a set of reliable biomarkers for improved detection of plaque instability in patients with advanced carotid stenosis. Methods: Study patients (n = 101) were classified as histologically stable (n = 37) or unstable (n = 64). Serum levels of MMP-1, -2, -3, -7, -8, -9, MMP inhibitors TIMP-1, -2, and inflammatory factors such as tumor necrosis factor (TNF-α), interleukin (IL)-1β, -6, -8, -10, and -12 were measured by ELISA assays. Multiscore analysis was performed using multiple receiver operating characteristics analysis and determination of appropriate cutoff values. Results: Circulating levels of MMP-1, -7, TIMP-1, TNF-α, and IL-8 were significantly enhanced in patients with unstable plaques compared to individuals with stable lesions, mean differences being 1.2 (p = 0.032), 2.5 (p = 0.004), 30.0 (p = 0.014), 1.3 (p = 0.047), and 2.2 (p = 0.033), respectively. The combination of MMP-1, -7, TIMP-1 and IL-8 demonstrated the highest positive predictive value of 89.4% and negative predictive value of 60.1% for patients correctly classified as individuals with unstable and stable carotid lesions by means of blood sample analysis. Conclusions: Multiple relevant biomarkers that play a decisive role in plaque instability can improve the correct determination...
of vulnerable carotid plaques in patients with advanced carotid artery stenosis.

Stichworte: Carotid artery; Vulnerable plaques; Biomarker; Matrix metalloproteinases; Inflammatory factors

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