1.4: PROGNOSTIC VALUE OF PROXIMAL AORTA LONGITUDINAL STRAIN IN MARFAN SYNDROME

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Background: This study aims to translate two arterial measurements, aortic Pulse Wave Velocity (aPWV) and carotid Intima-Media Thickness (cIMT), into a combined Vascular Ageing Index (VAI), to evaluate the predictive power of VAI and utilize it to identify a sub-group with Healthy Vascular Ageing (HVA).

Methods: In all, 2718 subjects were included from the CV arm of the Malmo Diet Cancer study (median age 72 years, 62.2% females). Median follow-up for CV events (N = 269) was 6.5 years. VAI was created by a function that combined aPWV and cIMT. Cox regressions for aPWV, cIMT and VAI, adjusted for conventional CV risk factors, were carried out. aPWV and cIMT were mutually adjusted for while VAI was analyzed separately. Model improvements for a model of conventional CV risk factors were assessed using Harrell's c-statistic and continuous Net Reclassification Index (NRI).

Results: Cox regression Results: (fully adjusted model): 1 SD of log-(aPWV), HR: 1.22 (95% CI: 1.03–1.42, P = 0.010), 1 SD of log-VAI, HR: 1.43 (95% CI: 1.22–1.68, P < 0.001) (Figure1). C-statistics: 0.715 (conventional risk factor model), 0.721 (+aPWV), 0.734 (+aPWV and cIMT) and 0.732 (+VAI). NRI showed a significant (P < 0.001) improvement for classification of event-free subjects when adding aPWV and cIMT or VAI.

Conclusion: VAI added marginally to prediction of CV events. However, the classification of subjects who remained free from CV events was significantly improved.

1.5 DEEP VASCULAR PHENOTYPING IN PATIENTS WITH FIBROMUSCULAR DYSPLASIA

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Background: Fibromuscular dysplasia (FMD) is a non-atherosclerotic, non-inflammatory vascular disease involving medium-sized muscular arteries, whose pathophysiology is still unknown.

Objectives: We aimed at identifying systemic vascular alterations in usually non-affected arteries of patients with multifocal renal FMD by a deep imaging-based phenotyping.

Methods: This cross-sectional study included FMD patients (n = 50, 84% hypertensives), age-, sex- and BP-matched patients with primary hypertension (PH, n = 50) and healthy normotensive subjects (HS, n = 50). Brachial artery, carotid, BA endothelium-dependent flow-mediated dilation (EDD) and endothelium-independent vasodilation (EID) were studied. Aortic stiffness was assessed by carotid-to-femoral pulse wave velocity (PWV). We quantified abnormal echographic patterns in the common carotid wall by the triple signal score. Common carotid Young’s incremental elastic modulus (Einc)/stress curves were also plotted.

Results: FMD patients had impaired EID compared to PH and HS (p = 0.008, after adjustment for confounders p = 0.002), smaller BA diameter but comparable EDD and PWV. The prevalence of triple signal score >6 was 56%, 40% and 24% in FMD, PH and HS respectively (p = 0.005). FMD, but not PH, was significantly associated with triple signal (beta = 0.143, p = 0.022, r2 = 0.058). Impaired EDD was only present in FMD patients with triple signal score >6 (p for interaction = 0.047). For a given stress value of 80 kPa, Einc was higher in the presence of a triple signal score >6, especially in FMD patients.

Conclusions: Non-affected muscular and elastic arteries in patients with multifocal renal FMD exhibit a cluster of functional and structural abnormalities, while elastic arteries are preserved. Triple signal in FMD may identify a distinct vascular phenotype.