1.5: DEEP VASCULAR PHENOTYPING IN PATIENTS WITH FIBROMUSCULAR DYSPLASIA

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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.

1.4 PROGNOSTIC VALUE OF PROXIMAL AORTA LONGITUDINAL STRAIN IN MARFAN SYNDROME

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Background: Aortic root dilation and type A aortic dissection are the most common cardiovascular complications of Marfan syndrome (MFS). Current clinical management of MFS patients relies on a close follow-up of aortic root diameter and preventive aortic root surgery in case of severe or fast-progressing dilation. However, as the capacity of aortic diameter to predict type A aortic dissection is limited, new non-invasive biomarkers to improve risk stratification are needed. We investigated the capacity of proximal aorta longitudinal and circumferential strain and ascending aorta distensibility to predict aortic root diameter dilation and occurrence of major cardiovascular events in Marfan patients.

Methods: Eighty-seven Marfan patients without previous cardiac/aortic surgery or dissection were prospectively included in a multicenter follow-up. Proximal aorta longitudinal and circumferential strain and distensibility were computed from baseline CMR.

Results: During a follow-up of 81.6 ± 17 months, 11 patients underwent elective aortic root replacement, and 2 experienced type A aortic dissections. Mean dilation rate was 0.65 ± 0.67 mm/year and z-score growth rate 0.07 ± 0.131/year. In multivariable analysis, proximal aorta longitudinal strain but not circumferential strain and distensibility were independent predictors of diameter growth-rate (p = 0.001, p = 0.385 and p = 0.381, respectively), z-score growth-rate (p = 0.018, p = 0.515 and p = 0.484, respectively) and major cardiovascular events (p = 0.018, p = 0.064 and p = 0.205, respectively) corrected for demographic and clinical characteristics and baseline aortic root diameter.

Conclusions: In Marfan syndrome, proximal aorta longitudinal strain is an independent predictor of aortic root dilation and major cardiovascular events beyond aortic root diameter and established risk factors.