ASSOCIATION OF PLASMA MATRIX METALLOPROTEINASE-9 LEVELS WITH SUBCLINICAL ATEROSCLEROSIS AND VASCULAR STIFFNESS IN HEALTHY SUBJECTS

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Background: Matrix metalloproteinase-9 (MMP-9) is a vascular protease thought to serve as a biomarker of vascular remodeling. Plasma MMP-9 is decreased in hypertensive subjects with increased vascular stiffness. We tested the hypothesis that plasma MMP-9 would correlate with vascular health.

Methods: In a cross-sectional study of 99 healthy adults (age 41-69 years, mean 52.0±7.5) without hypertension, hypercholesterolemia, diabetes, or tobacco use were compared with 117 subjects (age 43-79, mean 60.7±8.4) with subclinical atherosclerosis and elevated cardiac risk (mean Framingham Risk Score = 7.6±8.7%). Carotid intima media thickness (IMT) by ultrasound, arterial stiffness by tonometry, and plasma MMP-9 were measured.

Results: Healthy subjects had lower carotid artery IMT (0.66±0.11 versus 0.79±0.14 mm, p<0.001) and lower arterial stiffness (augmentation index of 13.1±14.5 versus 25.5±11.0, p=0.002) than in at-risk subjects. Plasma MMP-9 was higher in healthy subjects than in the cardiovascular risk cohort (82.4±40.6 versus 33.5±17.6 ng/mL, p<0.001), even after controlling for age (Figure 1) and sex. While age in healthy subjects correlated with IMT (r=0.541, p<0.001) and augmentation index (0.238, p=0.025), there was no correlation with MMP-9 levels.

Conclusions: MMP-9 is an age-independent marker associated with reduced subclinical atherosclerosis and preserved arterial compliance, suggesting a contribution of MMP-9 in maintenance of vascular health.