The urinary proteomic profile of arterial stiffness in the general population

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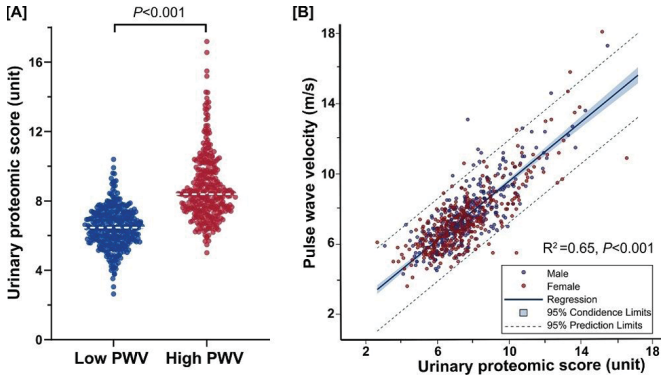
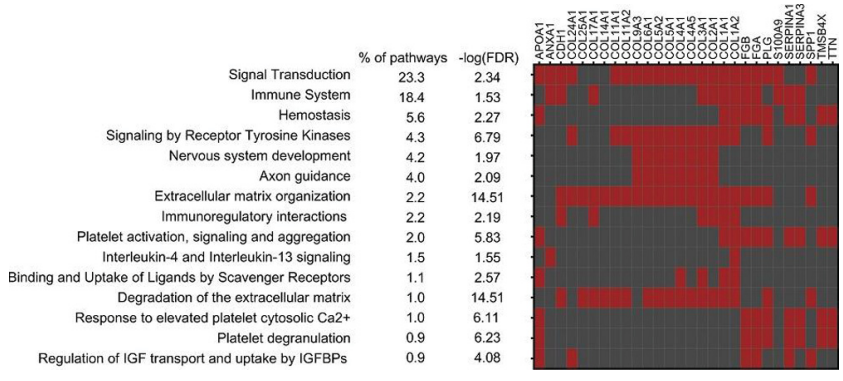
Background: Although arterial stiffness is an independent predictor of cardiovascular outcomes, its physiopathology remains unclear.
Purpose: This study aimed to investigate the urinary proteomic profile of aortic stiffness and provide insights into pathogenetic processes of arterial stiffness by pathway analysis.
Methods: In 669 participants (mean age, 50.5 years; 48.9% men) randomly recruited from the Flemish population, we measured carotid-femoral pulse wave velocity (PWV) by applanation tonometry. The proteomics of urine samples was quantified by using capillary electrophoresis coupled mass spectrometry. The proteomic data were analysed by the orthogonal projections to latent structures, a supervised dimensional reduction statistic method and summarised as a urinary proteomic (UP) score.
Results: The mean values were 7.56±2.02 m/s for PWV and 7.59±1.95 unit for the UP score. PWV was significantly associated with the UP score before and after adjustment for the potential covariates (β coefficient: 0.81 and 0.75, respectively; $p<0.001$). The significant proteins in the urinary proteomic profile consisted of 43 kinds of proteins, including collagen I, II and III, fibrinogen, matrix Gla-protein, apolipoprotein A-I and A-VI. The pathways annotated by the significant proteins mainly involved in fibrosis, signal conduction, platelet activation and aggregation.
Conclusions: In conclusion, the urinary proteomic profile could be a new biomarker of aortic stiffness and the altered proteins may link to the underlying mechanisms and holds the potential to discover novel therapeutic targets for arterial stiffness.



Distribution and Correlation



The Enrichment Pathways

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