
Genetics and Pharmacogenomics

3.1 Heritability of the Ambulatory Arterial Stiffness Index in Swedish Families

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Introduction: In our previous study we obtained high estimates of heritability for pulse pressure measured by 24-hour Ambulatory Blood Pressure (ABP) monitoring suggesting that arterial stiffness has a strong genetic component. The Ambulatory Arterial Stiffness Index (AASI) obtained from ABP monitoring was recently proposed as index of arterial stiffness and was associated with increased cardiovascular morbidity and mortality. The aim of our study was to test if the AASI is heritable.

Methods: We measured ABP in 260 healthy siblings without drugs that can alter blood pressure from 118 Swedish families. The AASI was calculated as 1- the regression slope of diastolic blood pressure on systolic blood pressure. Heritability of the AASI was estimated with a maximum likelihood method before and after adjustment for significant covariates (age, pulse pressure, heart rate).

Results: AASI resulted to be significantly heritable both before and after adjustment for covariates (41% before adjustment; PWe then, reanalysed 24-hour PP heritability after adjusting it also for AASI to see if the significant heritability of PP is independent from that of AASI. AASI was independently related to 24 hour-PP. After adjustment of 24-hour PP for AASI, age sex and BMI the heritability decreased from 63% to 55% but remained significant (p=0.0019).

Conclusion: Our data suggest that both AASI and PP are partially under genetic control and can capture independent information on inherited factors that contribute to arterial stiffness. Thus, genetic linkage and association studies of AASI and PP may identify loci and gene variants of importance for arterial stiffness.