DETERMINANTS OF DEVELOPMENT OF STRUCTURAL ARTERIAL DISEASE IN YOUNG ADULTHOOD: THE ALSPAC STUDY

Poster Contributions
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Background: Endothelial dysfunction is an early event in the development of cardiovascular disease and has been associated with adverse cardiovascular outcome in adulthood. In the largest longitudinal study of Parents and Children (ALSPAC) we investigated whether endothelial function and change in cardiovascular risk factors from childhood to adulthood can explain the development of structural arterial disease in young adulthood.

Methods: Cardiovascular risk factors including blood pressure, total cholesterol, and body mass index were measured in ALSPAC cohort at 10 and 17 years of age. Endothelial function was measured by flow mediated dilatation (FMD) in the brachial artery at 10 years and structural arterial disease was assessed by carotid intima media thickness (cIMT) at 17 years.

Results: FMD was performed in 6614 children and cIMT in 4621. Males had higher cIMT compared to females at 17 years (p<0.001). As there was a sex interaction with FMD, determinants of cIMT and change in CV risk factors were assessed separately for males and females. In males, change in CV risk factors including systolic blood pressure, lipids, body mass index was not predictive of cIMT at 17 years whereas systolic blood pressure at 17 was the main determinant (beta 0.05 per 10 mmHg, p <0.001). In females, FMD (beta -0.001, p: 0.004), systolic blood pressure at 17 years (beta 0.05 per 10 mmHg, p: 0.001) and were strongly associated with cIMT.

Conclusion: In the largest longitudinal study of children to young adulthood, we demonstrated that the determinants of development of structural arterial disease are different between males and females. In males progression of arterial disease is mostly blood pressure driven whereas endothelial function, blood pressure contribute to the development of arterial disease in females. These findings are important for the evaluation of preventative strategies as children progress through adolescence.