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Diet quality scores in childhood and arterial stiffness and carotid artery intima-media thickness in adolescence/early adulthood: findings from the ALSPAC cohort

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This abstract was presented as the Nutrition in the treatment, management and prevention of disease Theme highlight.

The link between overall diet quality in children and arterial disease progression in adolescents and young adults remains unclear due to limited prospective studies in this area⁽¹⁾. Therefore, this cohort study examined the relationship between diet quality during childhood and arterial stiffness and thickness during adolescence and early adulthood.

Participants were children from the Avon Longitudinal Study of Parents and Children (ALSPAC)⁽²⁾ with diet diary data collected at 7, 10 and 13 years and data on pulse wave velocity (PWV) (marker of arterial stiffness) and carotid intima-media thickness (cIMT) (marker of pre-clinical atherosclerosis) measured at age 17 and 24 years. Complete data on PWV were available for 2,782 participants at 17 years and 1,636 at 24 years, and complete data on cIMT were available for 3,203 participants at 17 years and 1,382 at 24 years. Diet quality (DQ) was assessed with five scores: a children's relative Mediterranean-style diet (C-rMED) z-score, a children's Dietary Inflammatory z-Score (C-DIS), a Dietary Approaches to Stop Hypertension (DASH) z-score, a children's Eatwell Guide (C-EWG) z-score reflecting adherence to UK dietary guidelines, and an Obesogenic z-score (energy dense, high fat, high sugar, low fibre pattern derived using reduced rank regression). Multivariable linear regression models examined the associations between the DQ z-scores at 7, 10 and 13 years and PWV and cIMT at 17 and 24 years, after adjusting for relevant confounders and imputing missing covariate data.

In fully adjusted models, a more Obesogenic z-score at 7 and 10 years was associated with an increased PWV at 17 years; β 0.07 (95% CI 0.01, 0.13) and β 0.10 (95% CI 0.04, 0.16) for high versus low Obesogenic z-score, respectively. A higher C-rMED z-score at 7 years was associated with a decrease in PWV at 17 years (β -0.07; 95% CI -0.14, -0.01 for high versus low C-rMED score). A higher C-DIS z-score (more anti-inflammatory diet) at 10 years was associated with a lower PWV at 17 years: β -0.06 (95% CI -0.12, -0.01) for high versus low C-DIS score. None of the DP scores at 7, 10 or 13 years were associated with PWV at 24 years or were associated with cIMT at 17 or 24 years.

An Obesogenic dietary pattern at 7 and 10 years was related to increased arterial stiffness, while a Mediterranean-style diet and an anti-inflammatory diet (both predominantly plant-based diets, rich in fibre, mono- and poly-unsaturated fats, antioxidants and anti-inflammatory foods/nutrients) at 7 or 10 years, respectively, were related to a decrease in arterial stiffness in adolescence. This highlights the importance of establishing healthy dietary habits early in life to protect against arterial stiffness - a marker of vascular damage and strong predictor of cardiovascular disease later in life^(1,3).

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