



P97 Age Modifies the Relationship Between Arterial Stiffness, Adiposity and Blood Pressure from Adolescence to Adulthood in Men and Women

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ABSTRACT

Introduction: Adult obesity is associated with greater arterial stiffness however in youth the relationship is unclear. We investigated associations between arterial stiffness and adiposity and explored the contribution of blood pressure from adolescence to emerging adulthood (17–24 yrs).

Methods: 3885 individuals (2152 female) had measurements of carotid-femoral pulse wave velocity (PWV), DXA total fat mass (TFM) and mean arterial pressure (MAP). Measurements were repeated aged 24 yrs ($n = 1659$). Linear regression and mixed models assessed sex—stratified associations between PWV, TFM and MAP, and age interactions.

Results: From 17–24 yrs PWV, TFM and MAP increased (Table 1). TFM showed a weak negative association with PWV in males at 17 yrs and 24 yrs. A positive association was observed in females at 17 yrs which was stronger at 24 yrs (pinteraction = 0.03). After adjustment for MAP the negative association was stronger in males and a negative association emerged in females aged 17 yrs; at 24 yrs the association remained positive in females. Adjustment for smoking, socioeconomic status and education attenuated associations in females aged 24, but otherwise had minimal effects. MAP was positively associated with PWV in both males and females at 17 yrs and 24 yrs; however, the association was weaker at 24 yrs, especially in males (pinteraction < 0.0001).

Conclusion: The association between adiposity and arterial stiffness differs by sex, is modified by age and influenced by blood pressure. In emerging adolescence, a positive association is seen between adiposity and PWV in women, suggesting that this may be an important time to control adiposity to provide long term cardiovascular benefits.

Table 1

	17 years		24 years		Male	Female
	Male	Female	Male	Female		
	mean ± SD	mean ± SD	mean ± SD	mean ± SD		
PWV (m/s)	6.1 ± 0.7	5.5 ± 0.6	6.7 ± 1.2	6.1 ± 0.7	0.65 ± 0.1**	0.55 ± 0.9**
TFM (kg)	13.0 ± 8.8	20.9 ± 8.5	20.3 ± 9.3	24.5 ± 10.3	7.3 ± 6.5**	3.7 ± 6.5**
MAP (mmHg)	83.0 ± 6.5	80.8 ± 6.5	85.5 ± 7.7	81.3 ± 7.7	2.5 ± 7.4**	0.5 ± 7.4*
Regression analysis						
PWV and TFM	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	TFM**age	p-value
Age	-0.004 (-0.10, 0.03)	0.083 (0.004, 0.0)**	-0.072 (-0.18, 0.04)	0.17 (0.10, 0.23)**	0.3	0.03
+ MAP	-0.13 (-0.20, -0.06)**	-0.020 (-0.07, 0.03)	-0.12 (-0.24, -0.001)*	0.10 (0.03, 0.17)**	0.16	0.05
+ SES education and smoking	-0.13 (-0.2, -0.06)**	-0.025 (-0.08, 0.03)	-0.13 (-0.26, 0.0007)*	0.05 (-0.025, 0.12)	0.4	0.7
PWV and MAP					MAP**age	p-value
Age	0.16 (0.10, 0.22)**	0.24 (0.20, 0.28)**	0.06 (-0.04, 0.15)	0.20 (0.13, 0.26)**	<0.0001	<0.0001
+ TFM	0.20 (0.14, 0.26)**	0.24 (0.20, 0.28)**	0.10 (-0.006, 0.23)*	0.16 (0.09, 0.23)**	<0.0001	<0.0001
+ SES education and smoking	0.23 (0.16, 0.29)**	0.25 (0.21, 0.30)**	0.13 (0.014, 0.25)*	0.16 (0.09, 0.23)**	<0.0001	<0.0001

* $p < 0.05$, ** $p < 0.01$. Associations between Pulse wave velocity (PWV), total fat mass (TFM) and mean arterial pressure (MAP). Socioeconomic status (SES).

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