

Supplemental Online Content

van der Linden IA, Roodenburg R, Nijhof SL, et al. Early-life risk factors for carotid intima-media thickness and carotid stiffness in adolescence. *JAMA Netw. Open.* 2024;7(9):e2434699. doi:10.1001/jamanetworkopen.2024.34699

eTable 1. Comparison of Participant Characteristics Between Participants Who Attended This Adolescent Follow-Up and Who Did Not Attend This Follow-Up

eFigure 1. Missing Data

eTable 2. Participant Characteristics Stratified by Sex

eFigure 2. Early-Life Risk Factors for Carotid Intima-Media Thickness and Carotid Distensibility in Adolescence

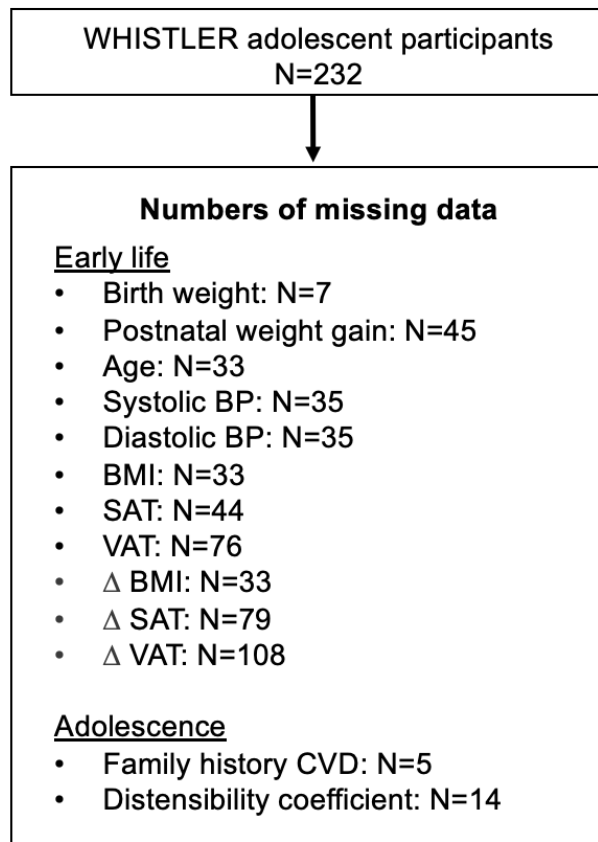
This supplemental material has been provided by the authors to give readers additional information about their work.

eTable 1. Comparison of participant characteristics between participants who attended this adolescent follow-up and who did not attend this follow-up

Characteristic No. (%) or mean (SD)	No		Adolescent			
	adolescent follow-up (N=2773)	N ^a	follow-up (N=232)	N ^b	P	95% CI
<i>Sex, female</i>	1284 (50%)	2556	122 (54%)	228	0.34	-0.10 – 0.04
<i>Birth weight, g</i>	3542 (503)	2488	3530 (506)	225	0.74	-56.86 – 80.41
<i>GA, wks</i>	39.4 (1.4)	2491	39.6 (1.4)	225	0.20	-0.30 – 0.06
<i>Maternal BMI</i>	24.7 (4.0)	2109	24.7 (4.0)	205	0.99	-0.57 – 0.58
<i>Paternal BMI</i>	25.1 (3.2)	2002	24.9 (3.1)	194	0.24	-0.19 – 0.74
<i>Maternal smoking in pregnancy</i>	157 (6.3%)	2482	15 (6.7%)	225	0.84	-0.04 – 0.03
<i>Maternal ever smoked</i>	712 (34.5%)	2064	72 (35.6%)	202	0.74	-0.06 – 0.08
<i>Paternal ever smoked</i>	758 (40.5%)	1870	85 (45.7%)	186	0.17	-0.02 – 0.13
<i>Maternal SES, high educated</i>	1438 (69.7%)	2063	134 (65.7%)	204	0.24	-0.03 – 0.11
<i>Paternal SES, high educated</i>	1253 (64.0%)	1957	113 (59.8%)	189	0.25	-0.03 – 0.11
<i>Maternal ethnicity, Caucasian</i>	1695 (81.6%)	2077	177 (87.6%)	202	0.03*	-0.12 - -0.01

GA: Gestational age, BMI: Body Mass Index in kg/m², SES: Socioeconomic status. ^aDenominator of WHISTLER participants who did not attend adolescent follow-up. ^bDenominator of WHISTLER participants who did attend adolescent follow-up.

eFigure 1. Missing Data



Postnatal weight gain: measured as the difference in weight Z-score from birth (corrected for sex and gestational age) to 6 months of age (corrected for age and sex). cIMT: carotid intima-media thickness, BMI: Body Mass Index, BP: blood pressure, SAT: abdominal subcutaneous adipose tissue depth, VAT: abdominal visceral adipose tissue depth, CVD: cardiovascular disease. “Δ” is the difference between adolescence (12-16 years) and early life (5 years) value.

eTable 2. Participant characteristics stratified by sex (part 1)

Characteristic	Birth (0-6 months)				N ^a
	Male	N ^a	Female	N ^a	
<i>Gestational age, wks</i>	39.0 (39.0–40.8)	104	40.0 (39.0–41.0)	121	225
<i>Birth weight, g</i>	3570 (530)	104	3495 (484)	121	225
<i>Postnatal weight gain, Z-score^d</i>	0.2 (1.1)	82	0.0 (0.9)	105	187
<i>Age, y</i>			NA		
<i>BMI, kg/m²</i>			NA		
<i>BMI, Z-score</i>			NA		
<i>Smoking, No. (%)</i>			NA		
<i>Family history of CVD, No. (%)</i>			NA		
<i>Systolic BP, mmHg</i>			NA		
<i>Percentile^e</i>			NA		
<i>Diastolic BP, mmHg</i>			NA		
<i>Percentile^e</i>			NA		
<i>SAT, mm</i>			NA		
<i>ΔSAT, mm</i>			NA		
<i>VAT, mm</i>			NA		
<i>ΔVAT, mm</i>			NA		
<i>cIMT, μm</i>			NA		
<i>Distensibility coefficient, 10⁻³/kPa</i>			NA		

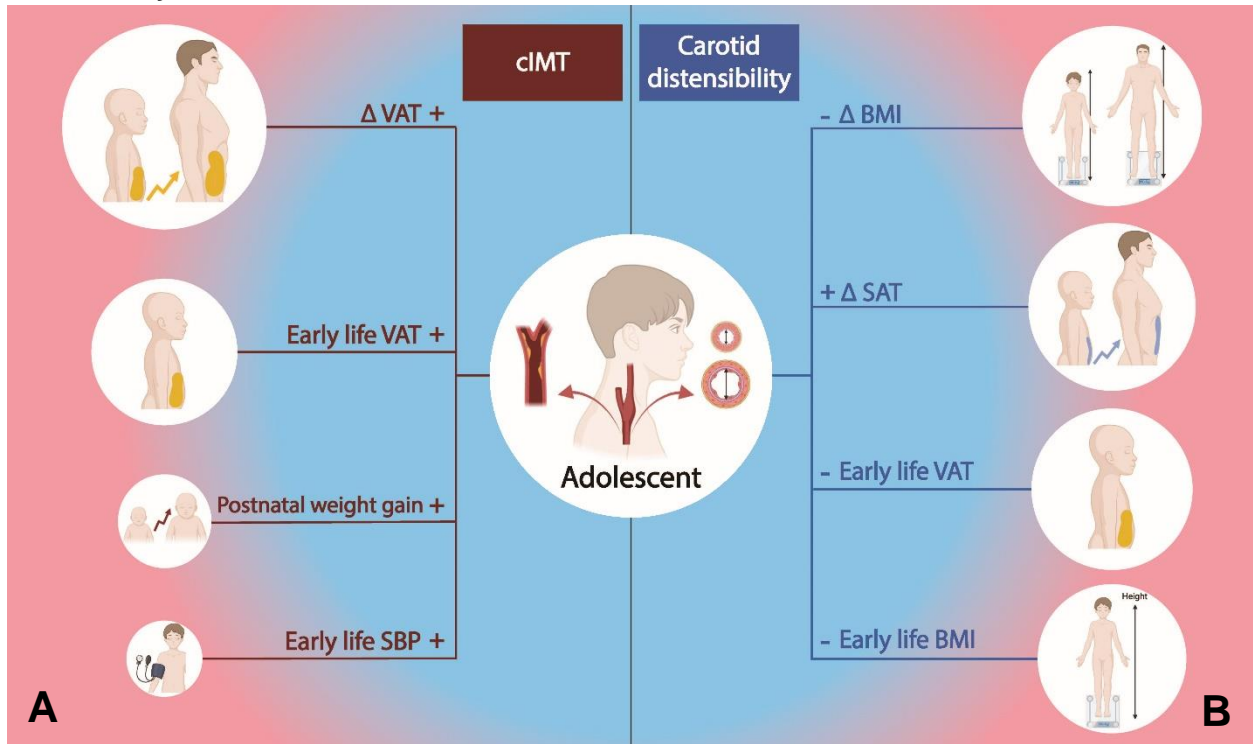
This is original non-imputed data. Shown are number (N) (%), mean (SD) for variables with normal distributions or median (interquartile range) for variables with skewed distributions. BP: blood pressure, BMI: Body Mass Index, SAT: abdominal subcutaneous adipose tissue depth, VAT: abdominal visceral adipose tissue depth, CVD: cardiovascular disease, cIMT: carotid intima-media thickness, “Δ” is the difference between adolescence (12-16 years) and early life (5 years) value. ^aDenominator of birth characteristics. ^bDenominator of early life characteristics. ^cDenominator of adolescent characteristics. ^dPostnatal weight gain measured as the difference in weight Z-score from birth (corrected for sex and gestational age) to 6 months of age (corrected for sex and age). ^eBP percentiles were calculated based on sex, height, and age.

eTable 2. Participant characteristics stratified by sex (continued - part 2)

Characteristic	Early life (5 years)				N ^b
	Male	N ^b	Female	N ^b	Total
Gestational age, wks	NA				
Birth weight, g	NA				
Postnatal weight gain, Z-score ^d	NA				
Age, y	5.3 (5.2–5.5)	91	5.3 (5.2–5.5)	108	199
BMI, kg/m ²	15.2 (1.2)	91	15.0 (1.2)	108	199
BMI, Z-score	-0.2 (1.1)	91	-0.2 (1.0)	108	199
Smoking, No. (%)	NA				
Family history of CVD, No. (%)	NA				
Systolic BP, mmHg	104 (99–110)	89	104 (99–108)	108	197
Percentile ^e	70.3 (22.2)	89	73.8 (17.9)	108	197
Diastolic BP, mmHg	54.6 (6.6)	89	53.0 (7.4)	108	197
Percentile ^e	40.4 (23.3)	89	35.9 (22.2)	108	197
SAT, mm	5.4 (4.2–6.8)	85	6.5 (5.3–8.3)	103	188
ΔSAT, mm	NA				
VAT, mm	36.2 (5.6)	76	35.0 (6.8)	80	156
ΔVAT, mm	NA				
cIMT, μm	NA				
Distensibility coefficient, 10 ⁻³ /kPa	NA				

Characteristic	Adolescence (12–16 years)				N ^c
	Male	N ^c	Female	N ^c	Total
Gestational age, wks	NA				
Birth weight, g	NA				
Postnatal weight gain, Z-score ^d	NA				
Age, y	14.7 (13.4–15.7)	109	14.9 (13.9–15.9)	123	232
BMI, kg/m ²	19.4 (3.3)	109	20.2 (2.9)	123	232
BMI, Z-score	0.1 (1.3)	109	0.3 (1.0)	123	232
Smoking, No. (%)	2 (1.8)	102	0 (0.0)	121	223
Family history of CVD, No. (%)	32 (29.4)	104	44 (35.8)	123	227
Systolic BP, mmHg	112.8 (106–119.9)	108	111 (105–116)	123	231
Percentile ^e	44.5 (25.7)	108	46.4 (22.9)	123	231
Diastolic BP, mmHg	56.7 (6.7)	108	56.7 (6.2)	123	231
Percentile ^e	20.6 (16.3)	108	17.0 (15.4)	123	231
SAT, mm	9.3 (7.2–15.3)	80	13.7 (10.1–20.0)	105	185
ΔSAT, mm	4.1 (2.2–8.3)	64	6.8 (4.4–11.9)	89	153
VAT, mm	45.3 (40.5–54.8)	77	40.8 (36.8–47.0)	103	180
ΔVAT, mm	11.4 (10.3)	55	8.2 (10.8)	69	124
cIMT, μm	430 (396–491)	109	435 (376–495)	123	232
Distensibility coefficient, 10 ⁻³ /kPa	40 (30–50)	101	40 (40–50)	117	218

eFigure 2. Early-life risk factors for carotid intima-media thickness (cIMT) and carotid distensibility in adolescence



Summary of the study findings following assessment of cIMT (A) and carotid distensibility, assessed by the carotid distensibility coefficient (B). Risk factors with significant associations with the outcome measures are displayed in the white circles, scaled according to their effect size determined by the standardized beta coefficients. Plus signs (+) indicate a positive association and minus signs (-) indicate a negative association. VAT: abdominal visceral adipose tissue depth, SBP: systolic blood pressure, BMI: Body Mass Index, SAT: abdominal subcutaneous adipose tissue depth, “ Δ ” is the difference between the early life (5 years) and adolescent (12-16 years) value. Created with BioRender.com