

Body composition and cardiovascular function in pre-adolescent children of South Asian and White European origin: Relationship to maternal status in pregnancy.

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Conclusions

- ❖ ethnicity influences cardiovascular function and body composition
- ❖ maternal BMI in pregnancy has a long lasting impact on offspring body composition.

Background

- South Asian (SA), British born adults have increased cardiovascular (CV) risk factors compared to White Europeans (WE).
- Early detection of CV risk may allow intervention.
- Babies of SA origin are born shorter, lighter and with a lower mean BMI than those of WE origin.
- We report here on ethnic differences in CV function and body composition in childhood.

Methods

- 102 subjects recruited from original Manchester Hyperglycaemia and Adverse Pregnancy Outcome study.
- 56 WE (25F; 31M) and 46 SA (22F:24M). Mean age 8.9y (range 6-12y).
- Height, weight, body fat % (truncal and arm fat as markers of central and peripheral fat respectively) and skinfold thickness measurements were taken along with Doppler echocardiography and blood pressure.
- Child birth data and maternal pregnancy data were already available.

Results

- Differences in height and weight previously reported between SA and WE babies were no longer significant at ~9 years of age and SA and WE children had comparable BMIs (Table 1).
- SA children did have significantly higher whole body fat.
- Increased fat was deposited as both central and peripheral fat.
- Suprailiac skinfolds were higher in SA compared to WE children.
- Body composition correlated positively with maternal BMI.

	Ethnicity	N	Mean ± SD	P value	Mat.BMI β Coeff	P value
BMI	WE	40	18.7 ± 2.5	0.31	0.34	.005
	SA	35	19.6 ± 4.4			
Whole body fat	WE	41	23.3 ± 5.0	0.001	0.33	.006
	SA	35	28.4 ± 7.9			
Central fat	WE	41	16.9 ± 4.6	0.001	0.30	.012
	SA	35	21.9 ± 6.9			
Peripheral fat	WE	41	31.8 ± 4.9	0.001	0.27	.025
	SA	35	36.8 ± 7.2			
Suprailiac	WE	51	10.3 ± 6.0	0.002	0.33	.002
	SA	46	15.3 ± 8.7			

Table 1. Body composition at age 9y. Groups were compared by t-tests and body composition was correlated to maternal BMI (Mat.BMI), glucose tolerance and blood pressure correcting for ethnicity and gender. Significant results (p < 0.05) are presented.

Diastolic Function

- Early phase Left Ventricular filling (E wave) was reduced in SA vs WE children (Fig. 1A).
- Late phase (A wave) was significantly elevated in SA compared to WE children (Fig. 1B).
- The E/A ratio was significantly lower in SA vs WE children (Fig. 1C) and remained so after correcting for Body Surface Area (BSA) indicating poorer diastolic function (Fig. 1D).
- Differences were unrelated to maternal BMI, glucose tolerance or blood pressure.

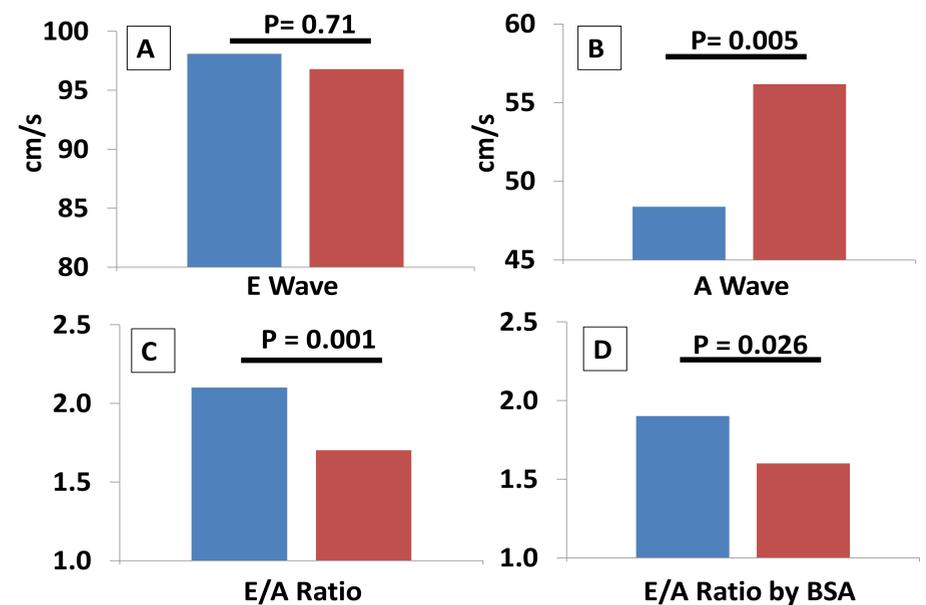


Figure 1. Echocardiography measures of Left Ventricular filling

Generalised Linear Modelling

- Ethnicity was significantly associated with the E/A ratio (p=0.003).
- Ethnicity, height SDS and weight SDS were significantly associated with central adiposity (all p<0.001). (Table 2)

E/A ratio	β Coeff	Wald Chi-Square	Sig.
Ethnicity	0.36	9.2	0.002
Gender	0.09	0.7	0.40
Weight SDS age 9	-0.07	0.9	0.34
Height SDS age 9	0.03	0.1	0.73
BMI SDS at birth	-0.03	0.3	0.59
maternal BMI	0.01	0.2	0.65

Central Fat	β Coeff	Wald Chi-Square	Sig.
Ethnicity	-4.8	29.9	<0.001
Gender	3.3	15.8	<0.001
Weight SDS age 9	5.0	75.5	<0.001
Height SDS age 9	-2.3	13.5	<0.001
BMI SDS at birth	0.3	0.8	.38
maternal BMI	-0.02	0.05	.83

Table 2. Generalised Linear Modelling of E/A ratio and Central fat. Significant models included ethnicity, gender, current height SDS and weight SDS (or BMI SDS), BMI SDS at birth and maternal BMI SDS as variables and either the E/A ratio (upper table) or central adiposity (lower table) as dependent variable.

Summary

- SA children had lower E/A ratios suggesting poorer diastolic function.
- SA children had higher levels of both central and peripheral fat than their WE counterparts despite having similar BMIs.
- Maternal BMI in pregnancy correlated with their child's body composition at age 9.