

IGF-I is associated with a more favourable pattern of body composition in obese children

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Background

Recent studies have suggested a role of IGF-I as a candidate prognostic marker for cardiometabolic complications of obesity.

Objective: To investigate the relationship between IGF-I serum levels and both biochemical and metabolic parameters as well as body composition in a cohort of obese children.

Methods

287 obese subjects (130F/157M), aged 11.2 ± 2.7 yrs, were studied. Anthropometry, biochemical and metabolic parameters, and IGF-I serum levels (expressed as SDS) were assessed. Body composition was evaluated by dual X-ray absorptiometry (DXA) in 201 children. IGF-I levels were subdivided in ascending tertiles. Differences between tertile groups were assessed by Mann-Whitney U-test.

	Correlation (R)	Significance (P)
Gender	-0.03	0.609
Age	0.107	0.071
Height sds	0.125	0.035
WC/height ratio	-0.35	<0.001
BMI sds	-1.31	0.03
AST	-0.231	0.001
ALT	-0.257	<0.001
C-reactive protein	-0.222	0.009
Fat mass percentage	-0.281	<0.001
Lean mass percentage	0.273	0.041
Total lean mass	0.145	0.041
Trunk lean mass	0.159	0.024

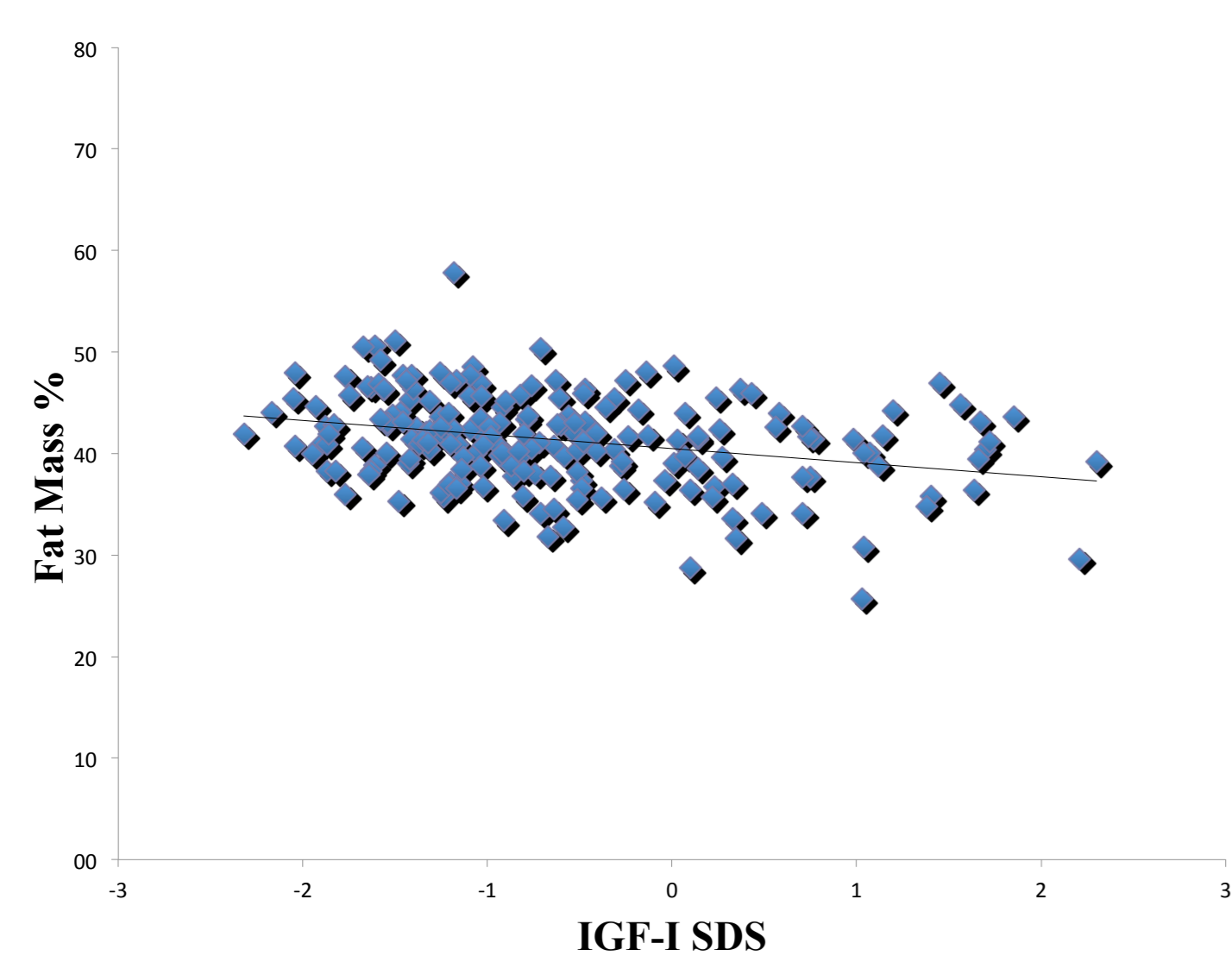


Fig. 1 Correlation between IGF-I SDS and Fat mass percentage

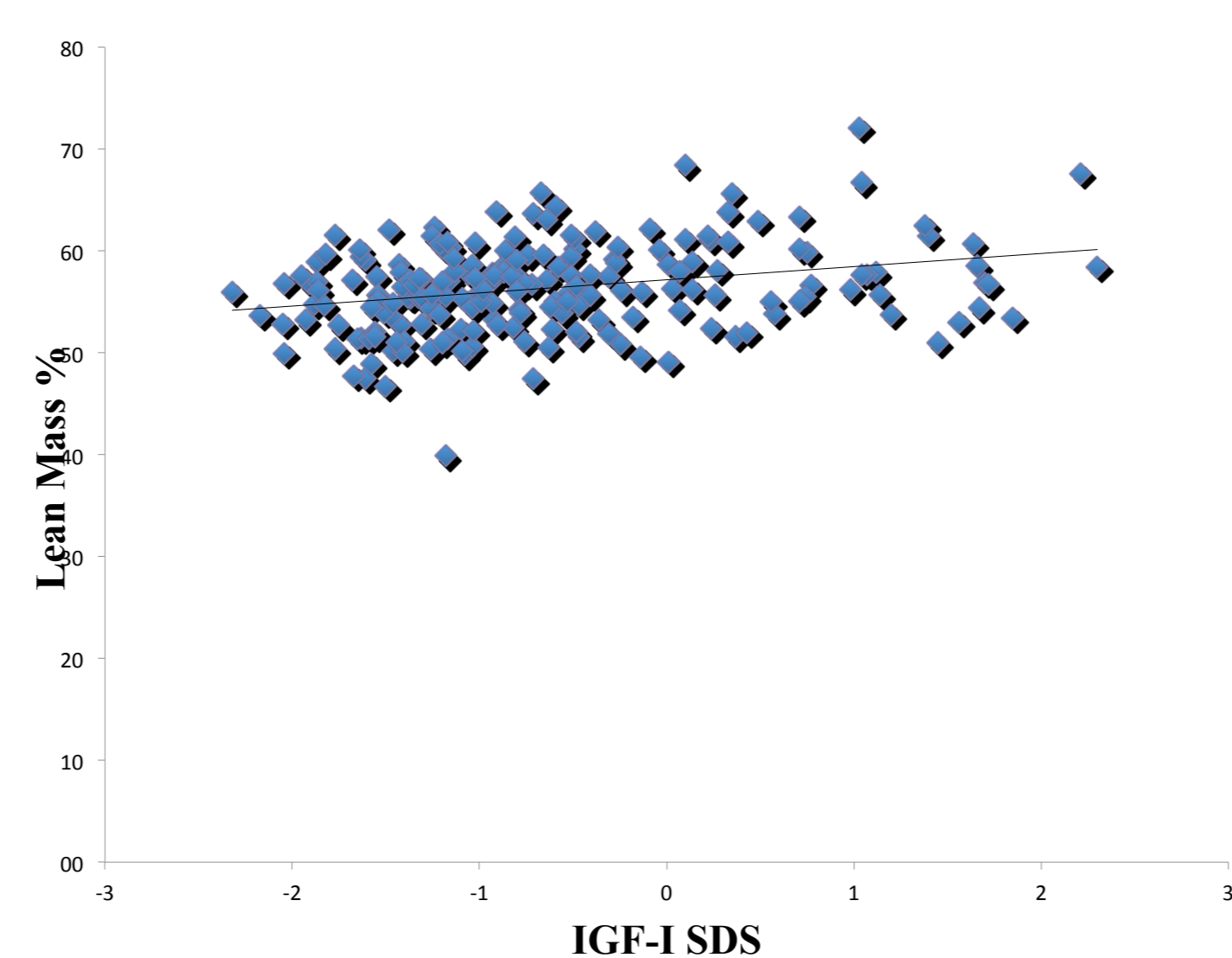


Fig. 2 Correlation between IGF-I SDS and Lean mass percentage

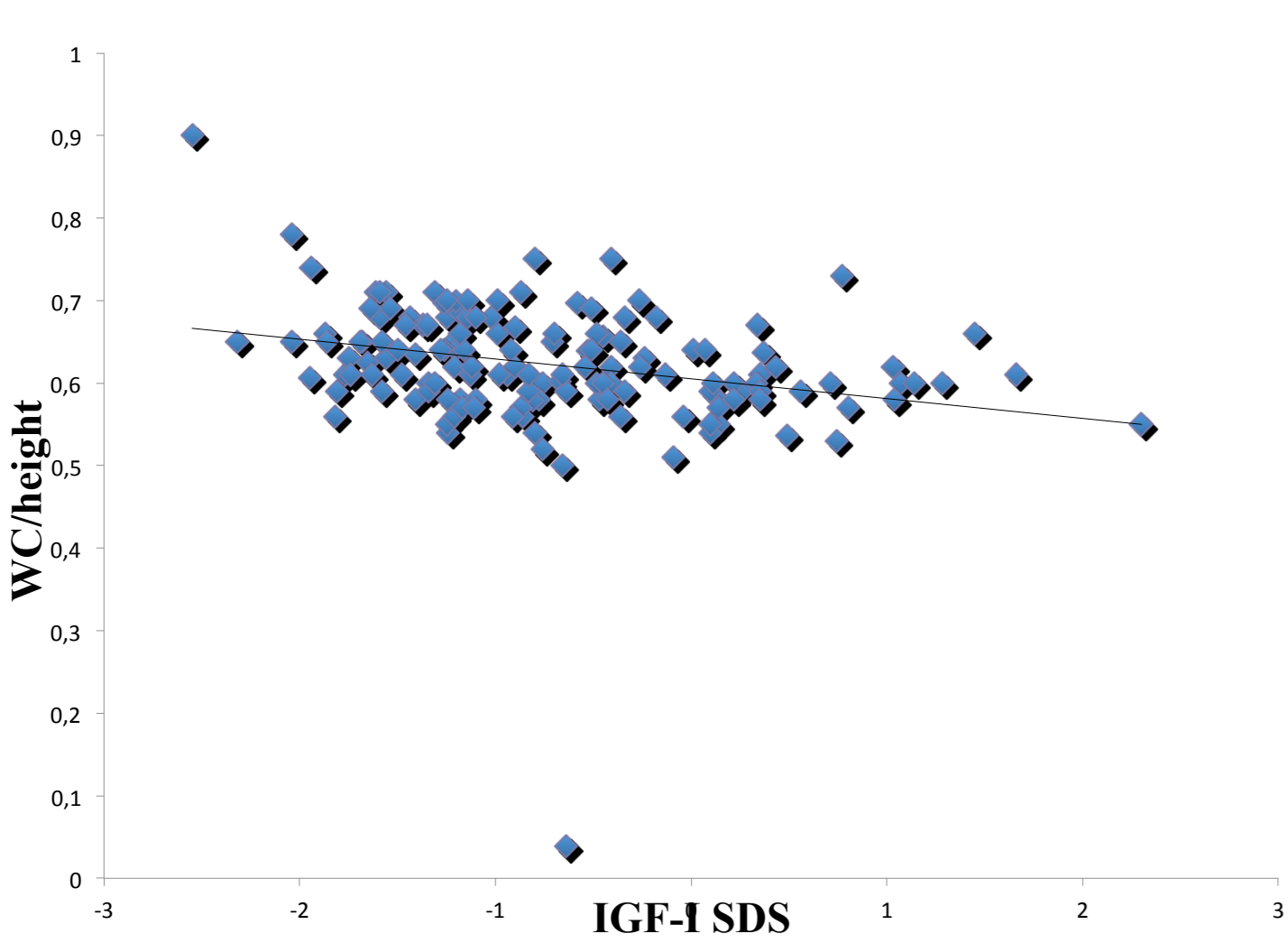


Fig. 3 Correlation between IGF-I SDS and WC/height ratio

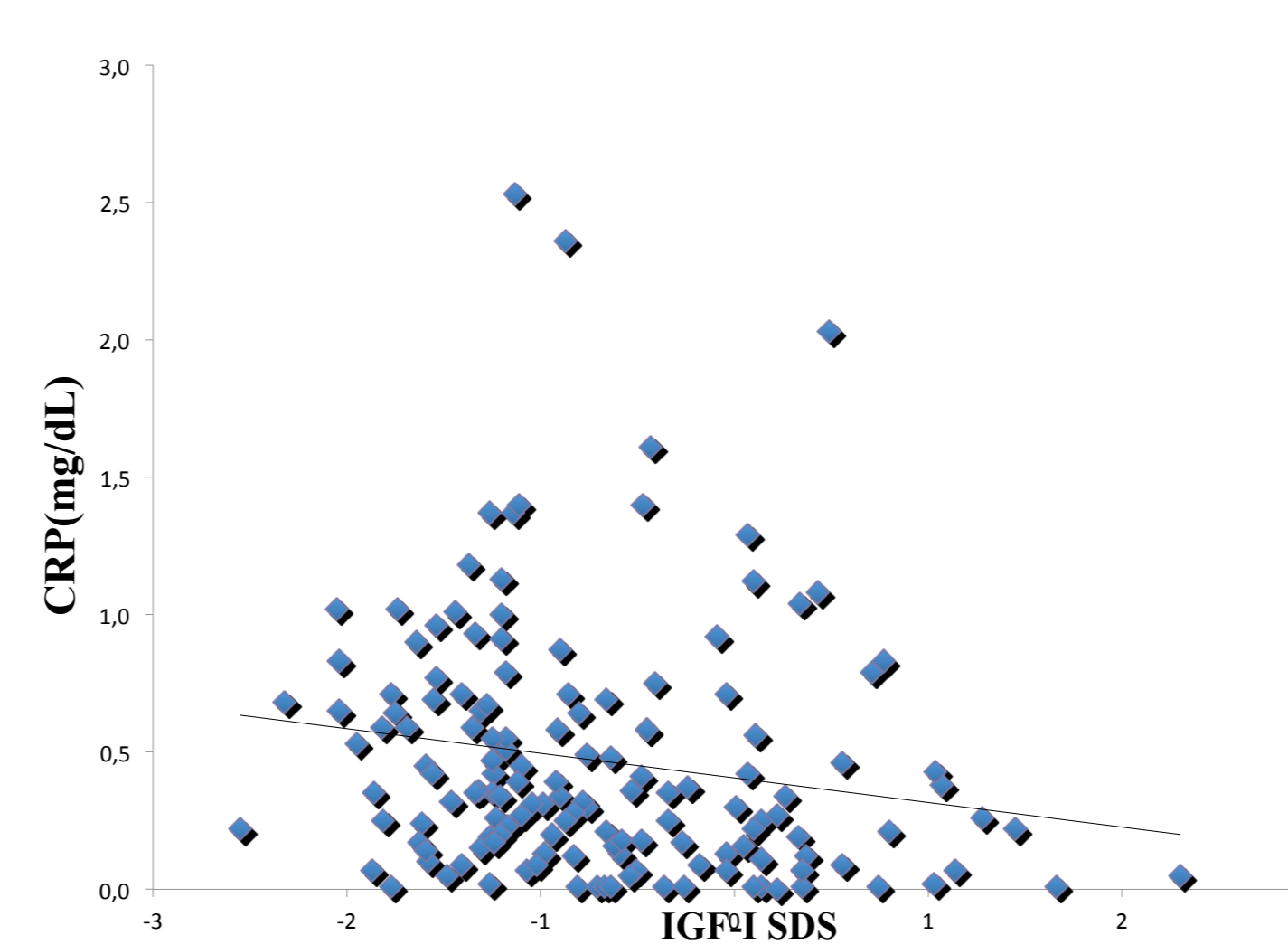


Fig. 4 Correlation between IGF-I SDS and C-reactive protein levels

Results

IGF-I levels were inversely related to waist circumference (WC)/height ratio ($r = -0.35$, $p < 0.001$), BMI SDS ($r = -1.31$, $p = 0.03$), aspartate aminotransferase (AST) levels ($r = -0.231$, $p = 0.001$), alanine aminotransferase (ALT) levels ($r = -0.257$, $p < 0.001$), fat mass percentage ($r = -0.281$, $p < 0.001$), and C-reactive protein (CRP) levels ($r = -0.222$, $p = 0.009$) and directly related with height SDS ($r = 0.125$, $p = 0.035$), lean mass percentage ($r = 0.273$, $p = 0.041$), total lean mass ($r = 0.145$, $p = 0.041$), and trunk lean mass ($r = 0.159$, $p = 0.024$). Stepwise regression analysis revealed that IGF-I was the major predictor of both fat mass percentage ($\beta = -0.3$, $p < 0.001$) and lean mass percentage ($\beta = 0.28$, $p < 0.001$). Compared to subjects with IGF-I levels in the highest tertile, patients with in the lowest tertile showed higher WC/height ratio (0.6 ± 0.051 vs 0.65 ± 0.058 , $p = 0.012$), fat mass percentage (38.98 ± 4.93 vs 42.81 ± 4.03 , $p = 0.001$), CRP levels (0.3 ± 0.29 vs 0.55 ± 0.43 , $p = 0.033$), LDL cholesterol levels (88.06 ± 19.57 vs 96.93 ± 23.88 , $P = 0.042$), AST levels (23 ± 7.15 vs 33.63 ± 19.67 , $p = 0.002$), and ALT levels (25.14 ± 17.83 vs 33.02 ± 20.67 , $p = 0.037$) while lean mass percentage resulted lower (55.01 ± 3.9 vs 58.58 ± 4.85 , $p = 0.002$).

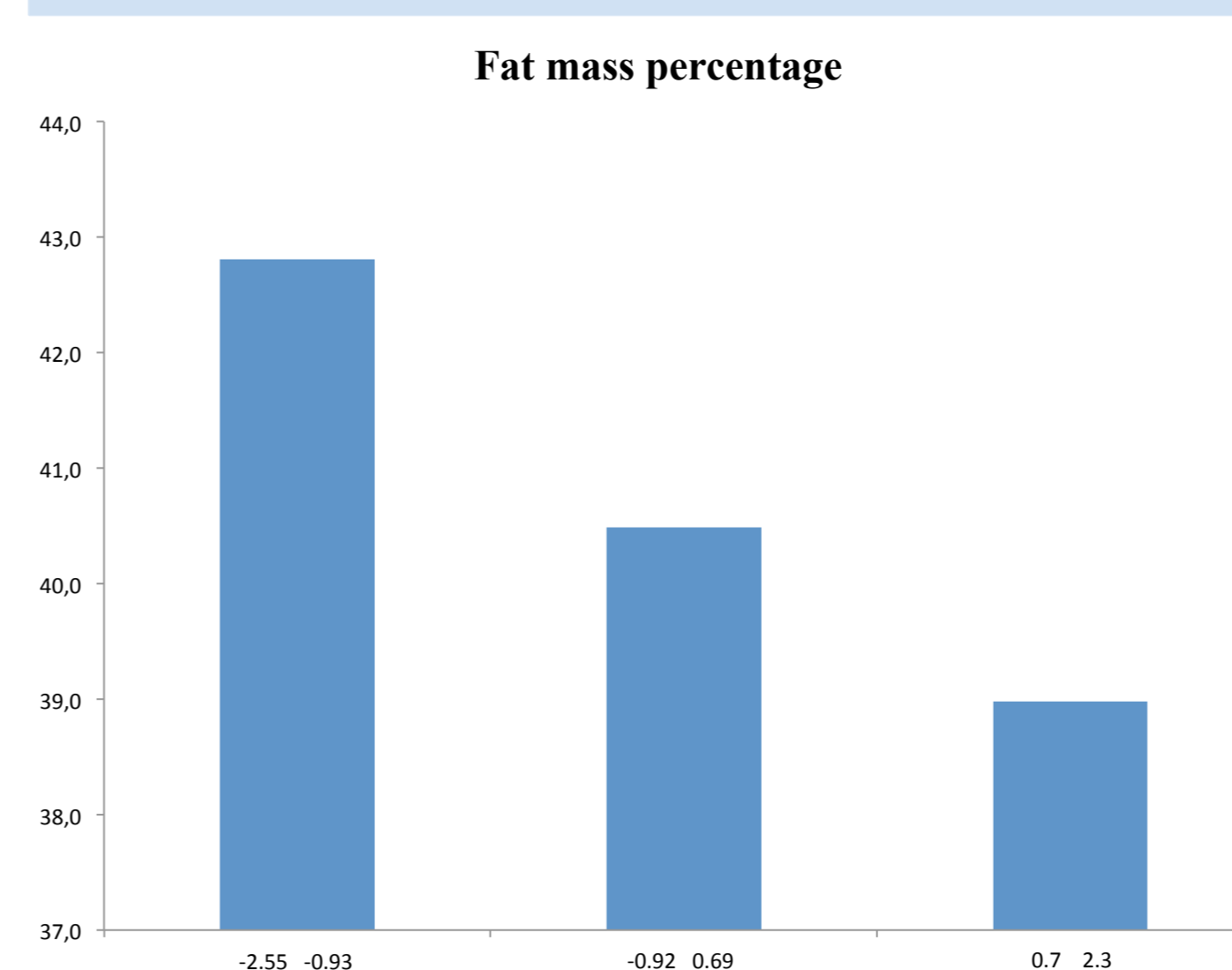


Fig. 5 Fat mass percentage in IGF-I sds tertile

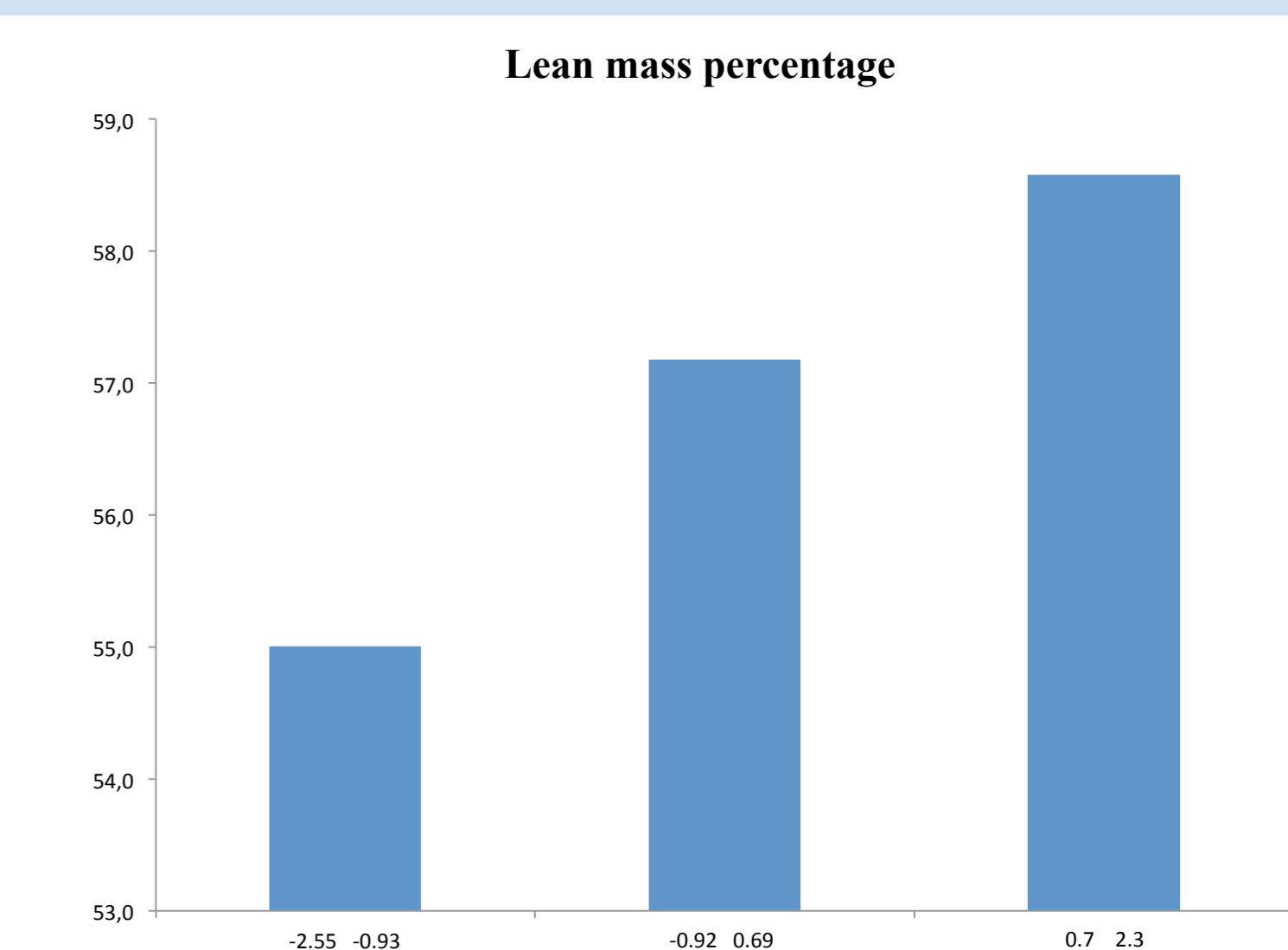


Fig. 6 Lean mass percentage in IGF-I sds tertile

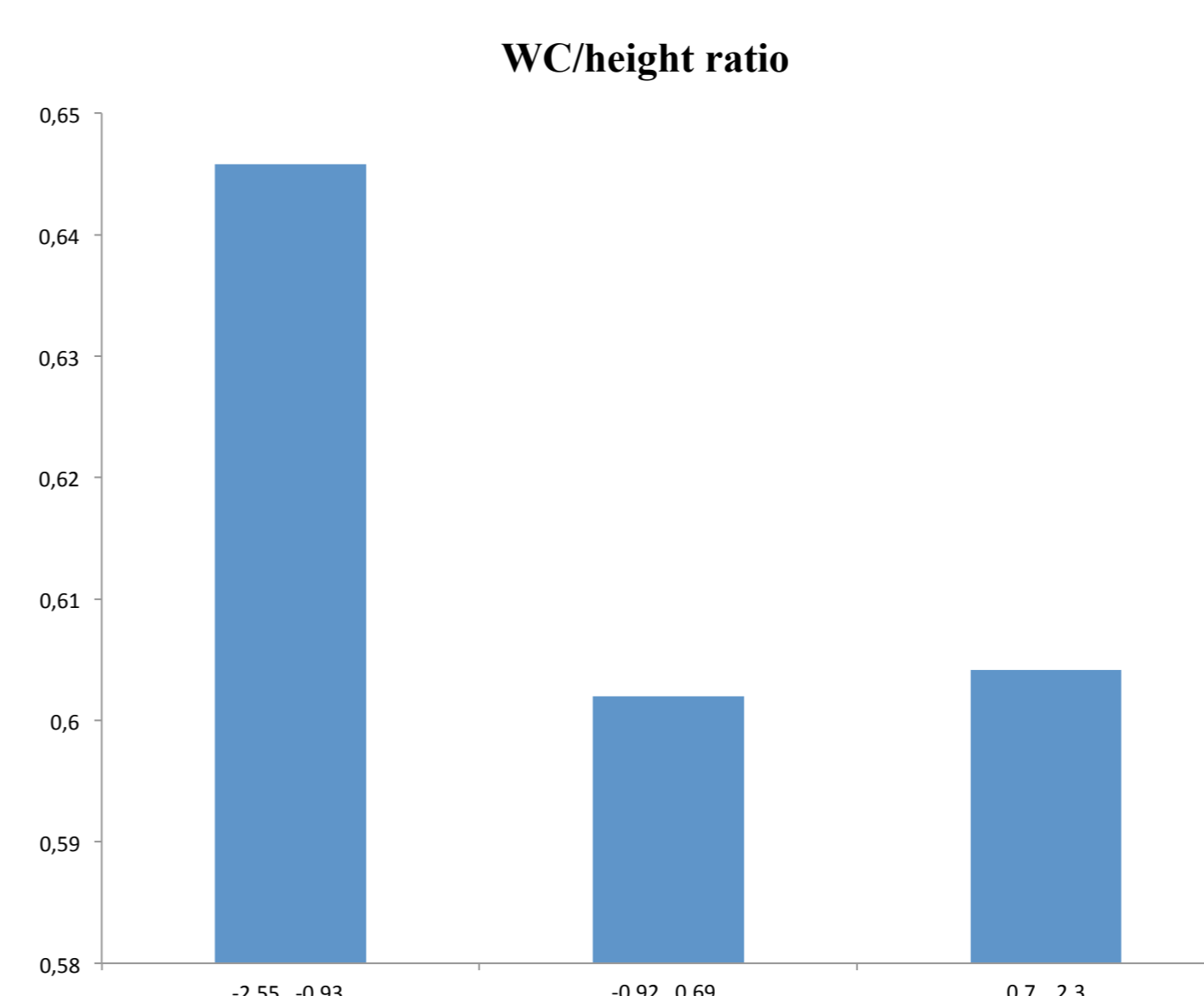


Fig. 7 WC/height ratio in IGF-I sds tertile

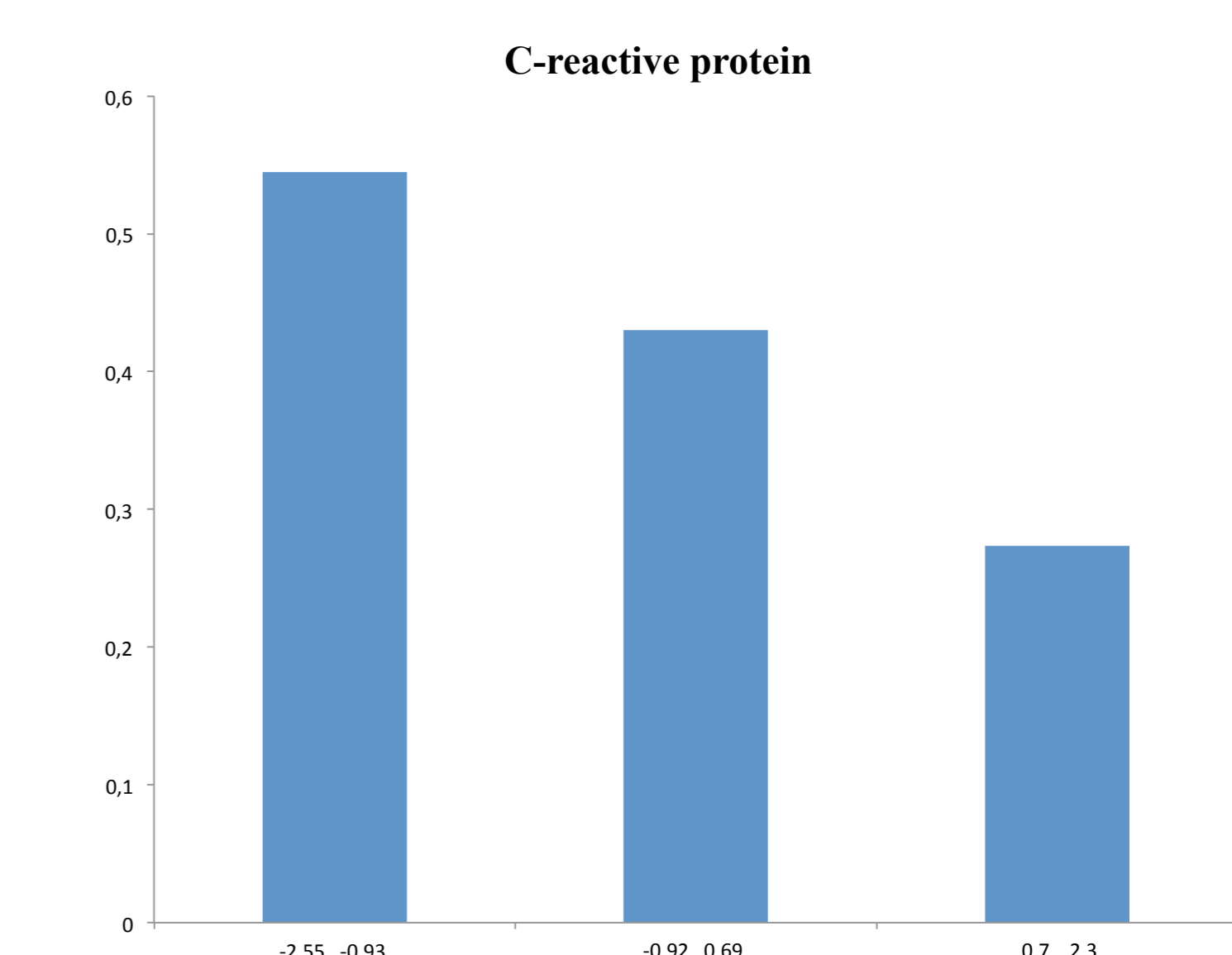


Fig. 8 CRP levels ratio in IGF-I sds tertile

Conclusions

IGF-I may play a role in the pathogenesis of obesity related cardiometabolic alterations and could represent a biomarker of risk in obese children.