Birth length and metabolic syndrome in obese children.

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Background

Low birth weight is associated with cardiometabolic risk in adulthood. To date, there is no evidence of a relationship between birth length and metabolic risk.

Objective: to evaluate the relationship between birth size and risk of metabolic syndrome (MetS) in obese children.

Methods

41 obese children were studied (23 F/18 M, 13.2 ± 1.26 yrs). All patients underwent anthropometric, biochemical, hormonal evaluation and careful familial history. Body composition assessment was available in 30 subjects. MetS was defined according to The International Diabetes Federation criteria.

Subjects were subdivided into two groups matched for age (± 0.5 year), gender and BMI (± 0.5), according to the presence of MetS (11 F/ 9 M, 13.2 ± 1.84 yrs) or not (12 F/ 9 M, 13.1 ± 1.68 yrs).

	Obese children with MetS	Obese children without MetS
N	20	21
F/M	11/9	12/9
Age yrs	13.2 1.8	13.1 1.7
BMI sds	3.1 0.9	3.1 0.9
IGF-1 sds	-0.6 1.01	-0.9 0.7
IGF-2 sds	-0.6 0.9	-0.3 0.8
Total fat mass %	40.9 4.6	41.1 4.8
Trunk fat mass %	41.1 3.6	41.4 3.9

Table 1. Clinical and biochemical parameters in obese children with and without metabolic syndrome.
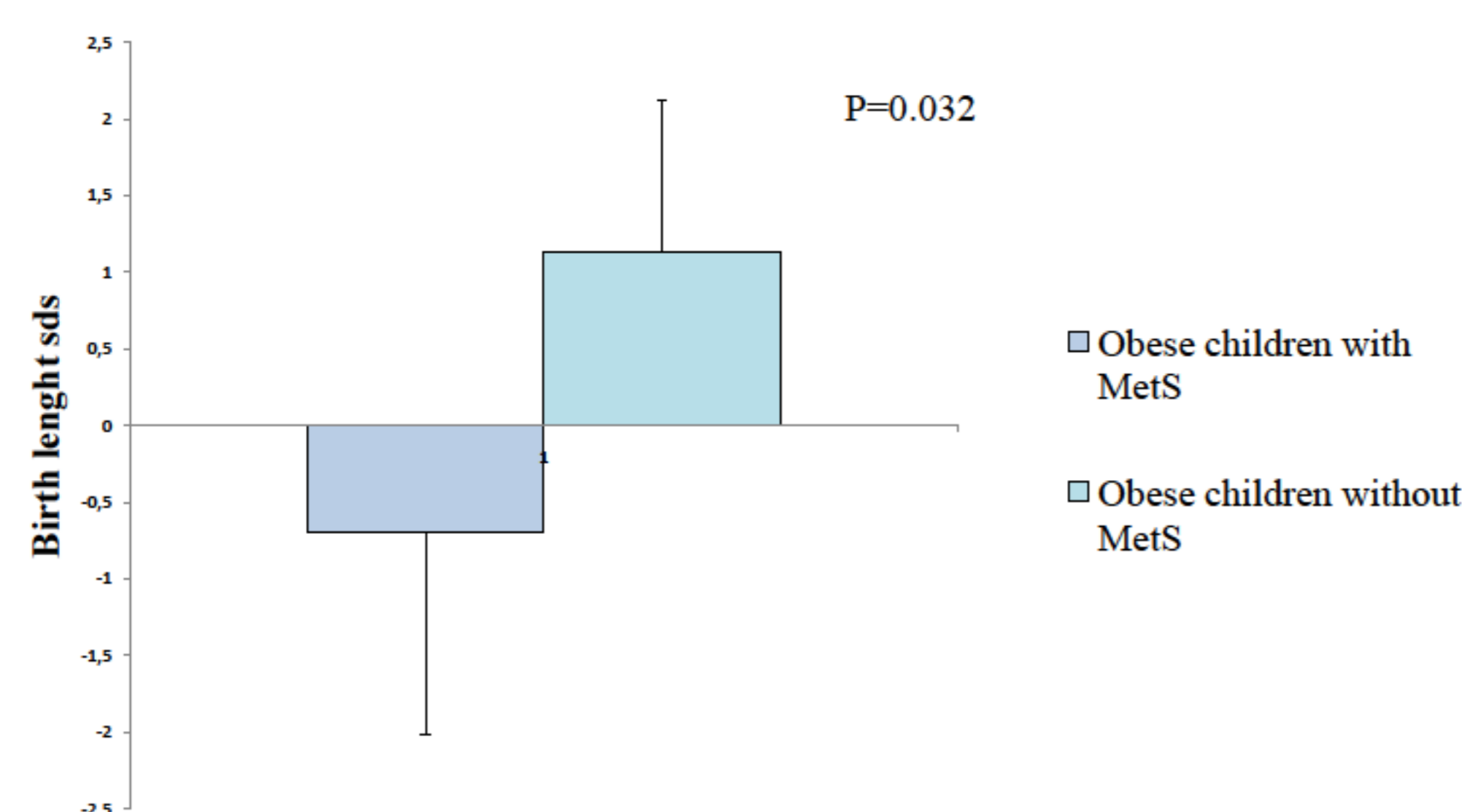

Figure 1. Birth lenght in obese children with and without metabolic syndrome.

Results

Patients with MetS were significantly shorter at birth than patients without MetS (-0.7±1.3 vs 1.13±2.39 SDS, p=0.032), whereas no difference in birth weight, current height, body composition were found. Familial history for obesity, type 2 diabetes and cardiovascular disease was not significantly different in the two groups. Birth length was inversely related to waist circumference height ratio (r= -0.49, p= 0.02) and BMI (r= -0.46, p= 0.03). Birth weight was inversely related to triglycerides (r= -0.44, p< 0.01) and triglyceride HDL cholesterol ratio (r= -0.44, p= 0.005).
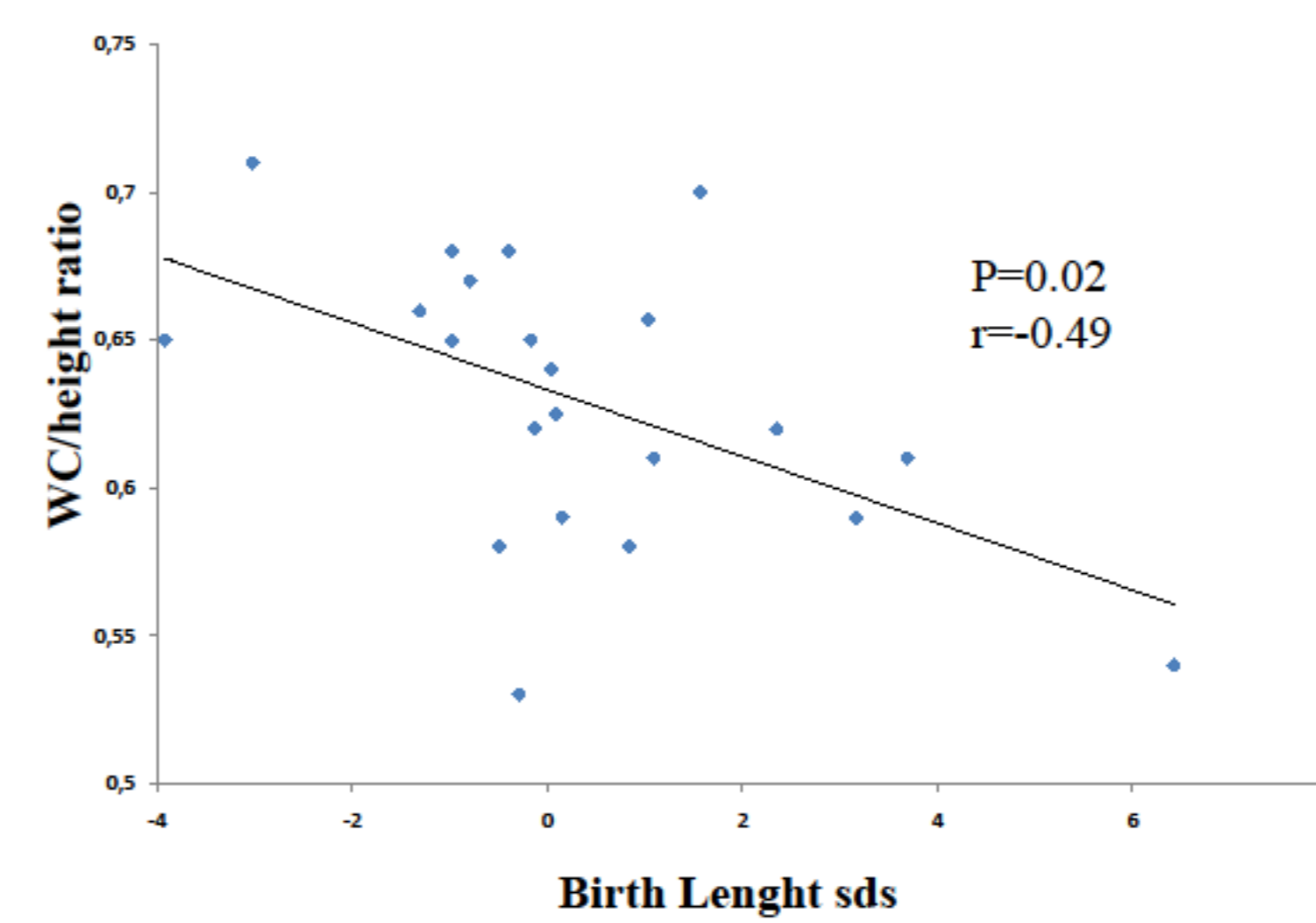

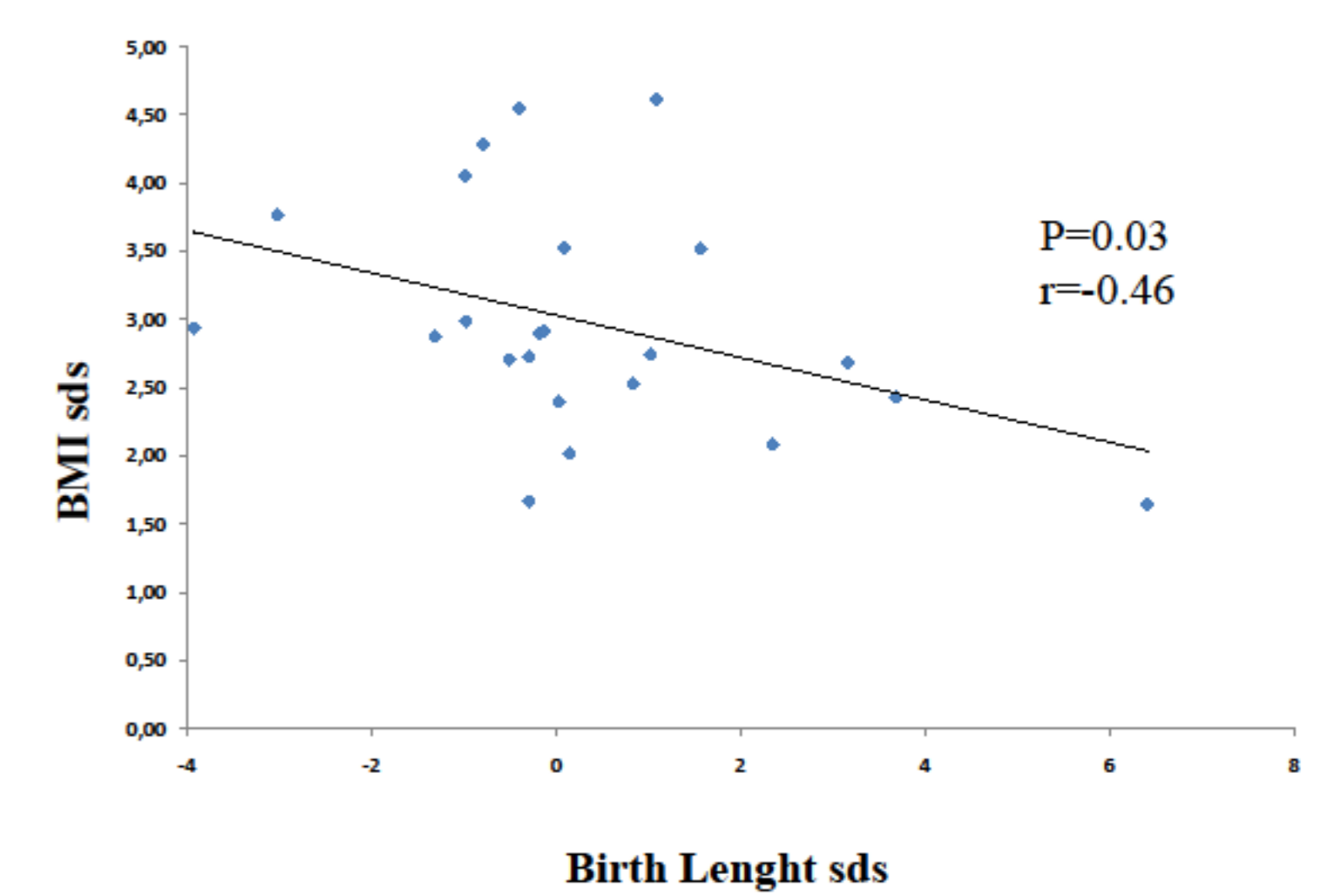Figure 1. Correlation between birth lenght and waist circumference/height ratio

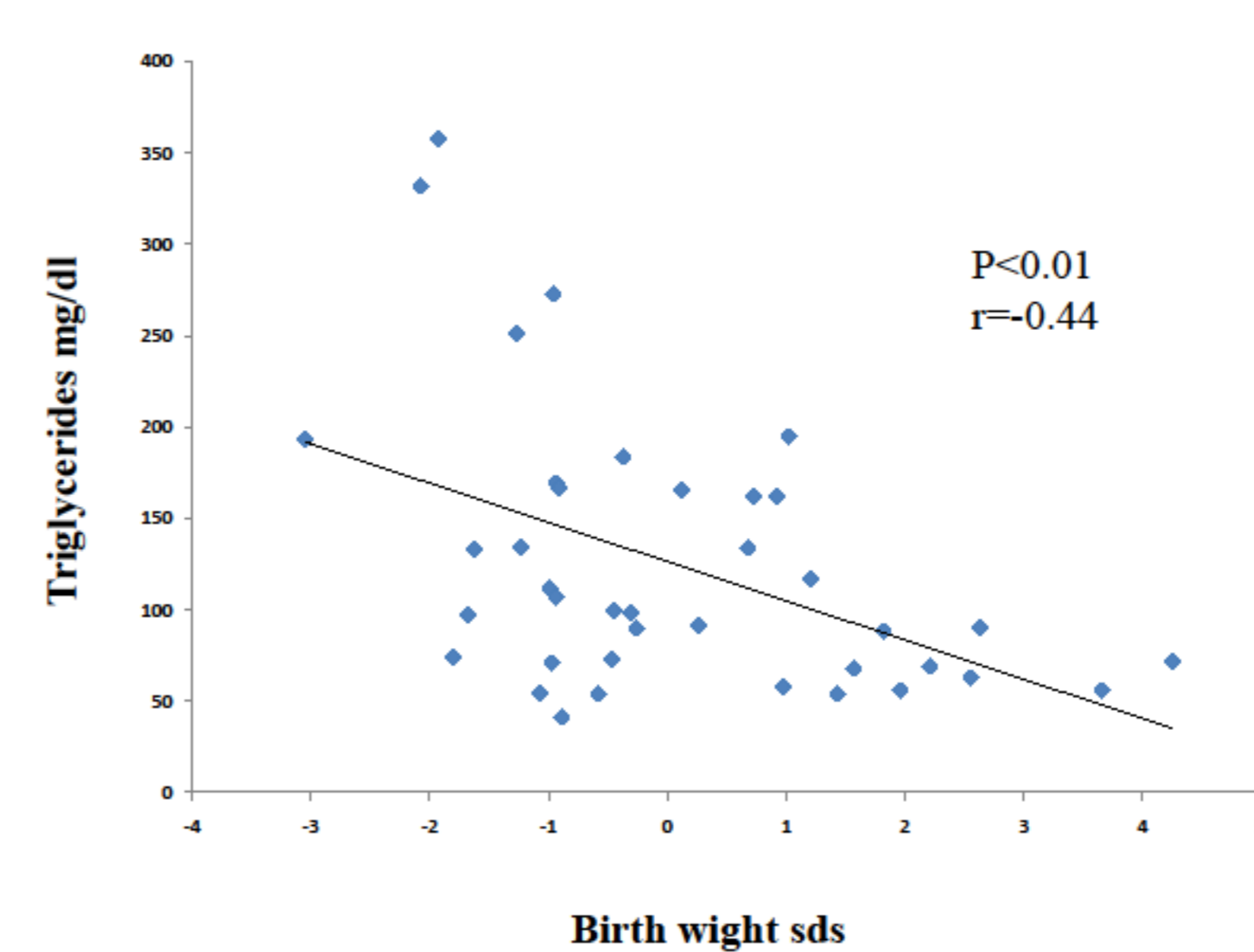Figure 2. Correlation between birth lenght and BMI

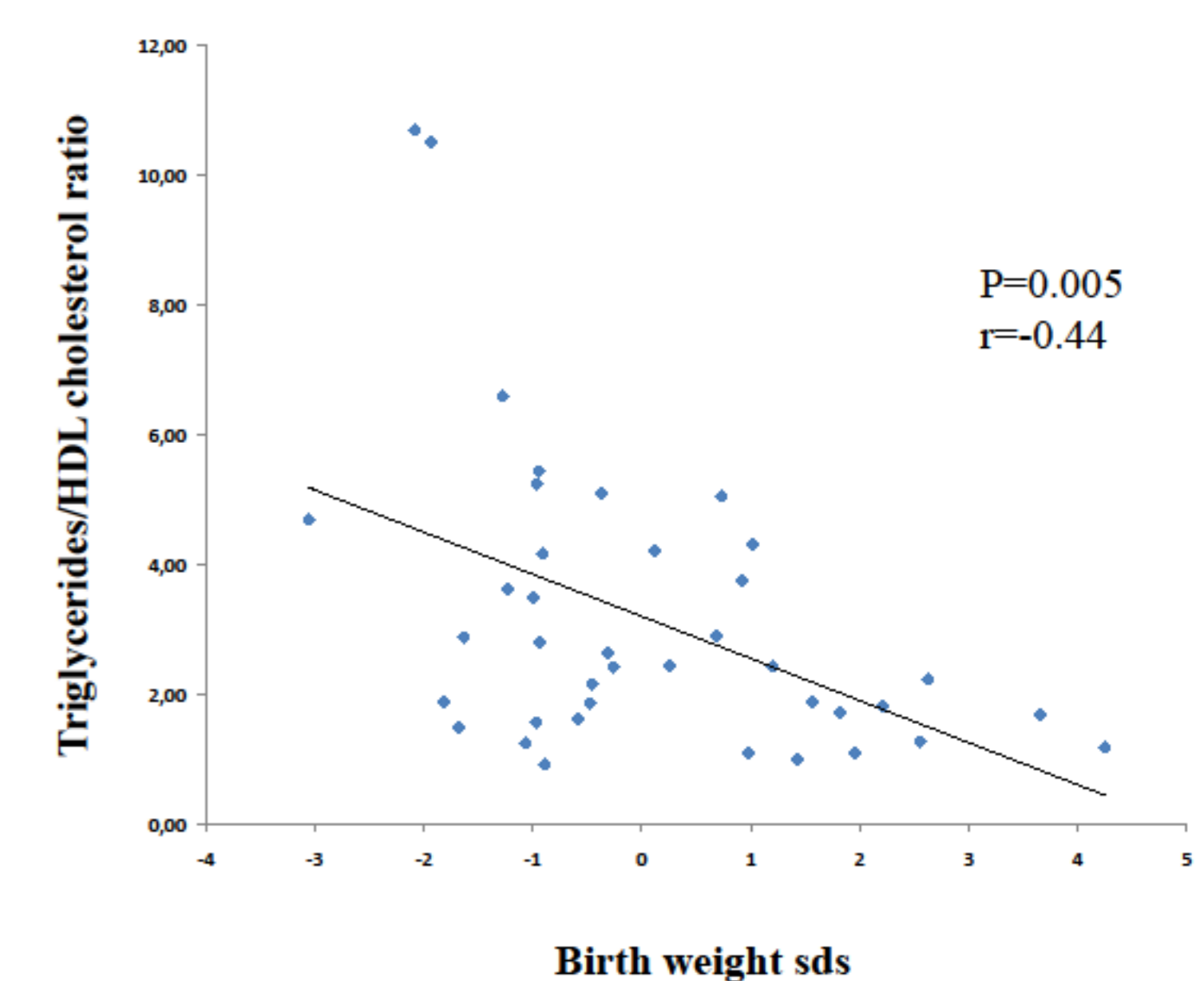Figure 3. Correlation between birth weight and triglycerides levels

Figure 4. Correlation between birth weight and triglycerides/HDL cholesterol levels

Conclusions

Our results suggest for the first time that birth length may be related to the risk of MetS in obese children independently of birth weight.

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