

SERUM ENDOCAN AS A PREDICTIVE BIOMARKER OF CARDIOVASCULAR RISK IN OBESE PEDIATRIC PATIENTS

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INTRODUCTION

Endocan is a soluble dermatan sulfate proteoglycan, composed of 165 amino acid core protein, expressed and secreted by endothelial cells of dermal microvasculature, coronary, pulmonary arteries, and capillaries from adipose tissue. It plays an important role in the pathogenesis of vascular disorders, inflammation, and neoangiogenesis. Endocan biosynthesis is upregulated by inflammatory cytokines (TNF- α , IL-1, TGF- β 1, VEGF, EGF, and FGF-2); conversely, it is downregulated by INF- γ and insulin level. **Endocan is a valid marker of endothelial cell damage in systemic inflammation, obesity, and cardiovascular diseases**, and could be linked to the severity and outcomes of these disorders.

AIM

Aims of our study are the following:

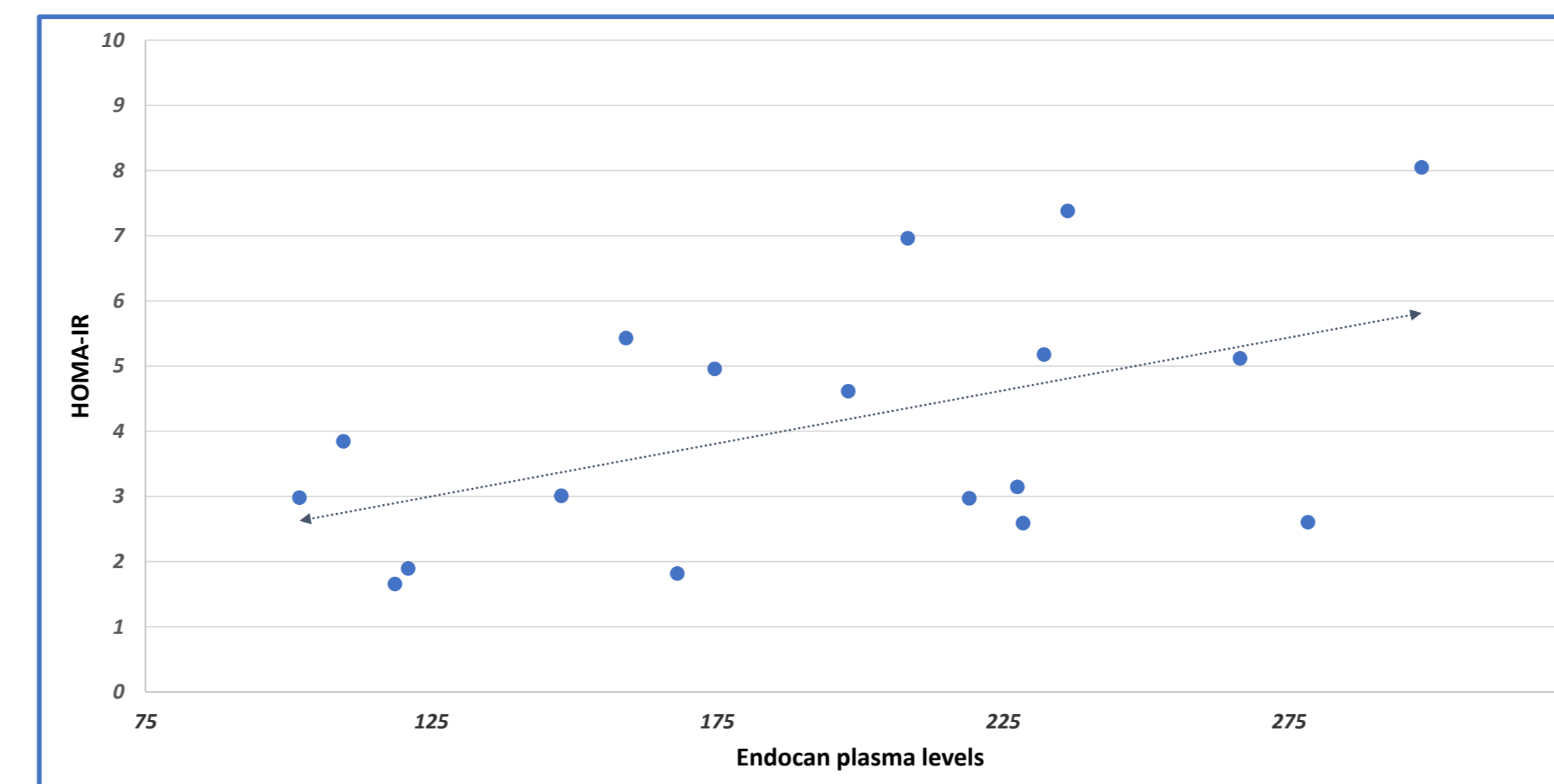
- to evaluate the use of endocan serum levels as an indicator of endothelial damage in children and adolescents with high BMI;
- to identify its possible correlation with other metabolic indices.

METHOD

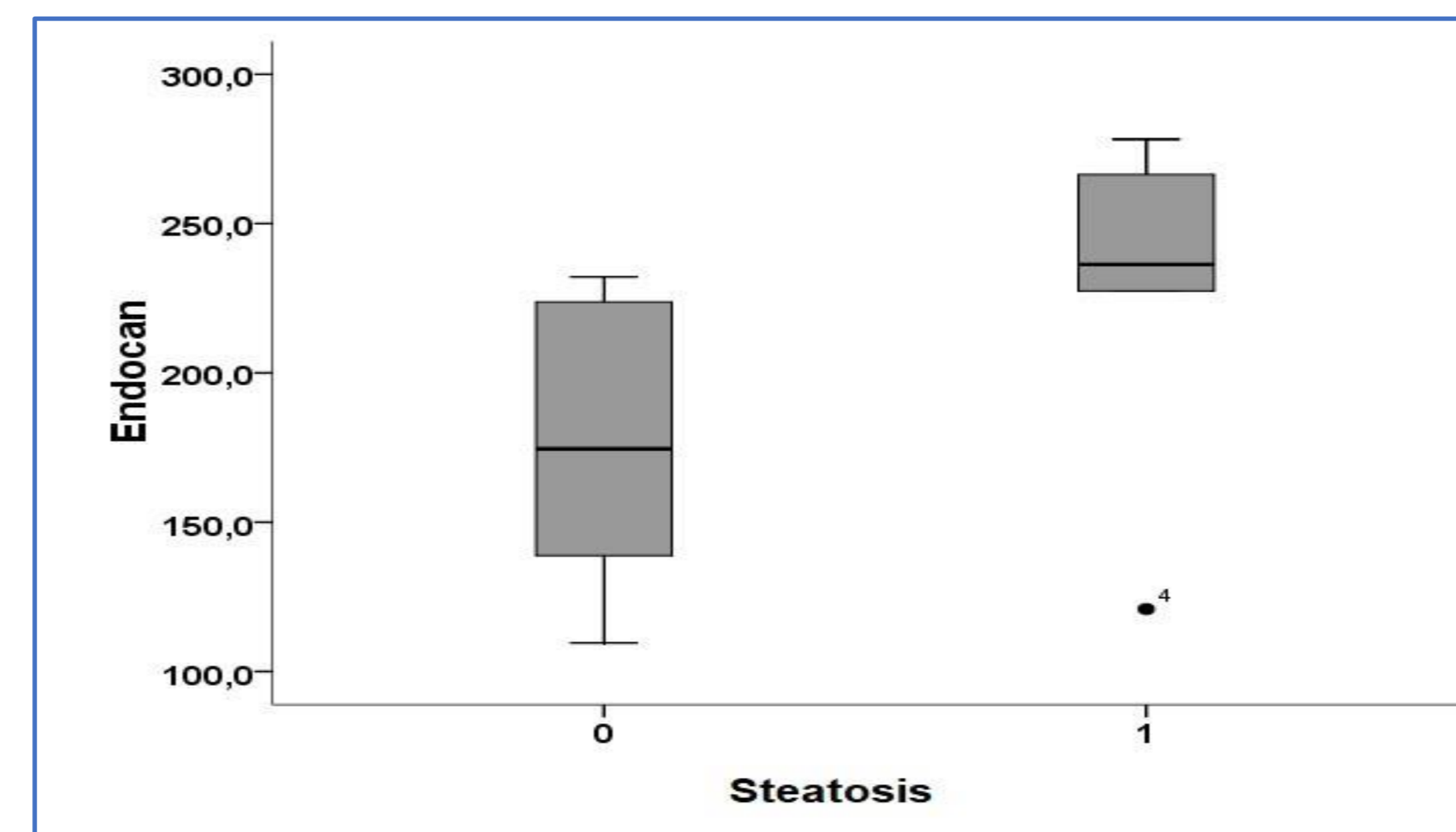
The study included **19 patients with obesity** (10 males, 9 females), **aged between 2-18 years** (mean age 11.94 \pm 0.52), screened at the Pediatric Endocrinology Unit of Messina (Italy) from October 2018 to May 2020. We assessed weight, height, and BMI, and measured levels of endocan, total cholesterol, HDL-C, LDL-C, triglycerides, blood glucose, and insulin. Abdomen ultrasound was also performed.

RESULTS

The results, compared with healthy controlled group, have shown upraised **endocan serum levels** in children with high BMI (**2.03 \pm 1.55 vs 0.82 \pm 0.34 ng/mL, p <0.001**); demonstrating a positive correlation trend between endocan and BMI (p = 0,13). Furthermore endocan serum levels were significantly correlated to **fasting insulin levels (p = 0,047)** and **HOMA-IR (p = 0.072)**. These findings confirm the linkage between endothelial damage and insulin resistance in obese children (*fig1*). Instead, we did not find any association between endocan and lipid profile (LDL-C p: 0,218; HDL p :0,684; TG p: 0,342), nor with fasting blood glucose value (p = 0,926). We also performed abdomen ultrasound, revealing a correlation with **steatosis and with its grade (p = 0.087, p = 0.088, respectively)**, despite not raising statistically significant results, given the small sample size, indeed only 12 children underwent ultrasound (*fig2*).



- Fig. 1 shows the correlation between Endocan and HOMA-IR (Spearman's Test)



- Fig. 2 shows the median levels of Endocan in relation with liver steatosis

	Endocan	
	Rho	P
AGE	0,165	0,5
BMI	0,356	0,135
SBP	-0,113	0,689
DBP	-0,279	0,313
TC	0,123	0,675
TG	-0,275	0,342
HDL	-0,119	0,684
LDL-C	0,306	0,218
GLUC	0,024	0,926
Insulin	0,474	0,047
HOMA	0,434	0,072
Steatosis	0,514	0,087
Steatosis grade	0,512	0,088

Tab. Correlation Panel (Spearman's test) between Endocan and other variables in the study

CONCLUSIONS

We can assume that endocan could be used, as a biomarker, also in children with obesity and that could be a valid predictor, in order to stratify the future cardiovascular risk in adulthood.

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