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## Biomarkers of inflammation in prepubertal obese Spanish children

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Obesity is associated with a low-grade systemic inflammation, recently called ‘metaflammation’ (metabolically triggered inflammation)<sup>(1)</sup>. Excess adiposity is strongly associated with elevated concentrations of circulating markers of inflammation, such as C-reactive protein (CRP), interleukin-6 (IL-6) and tumour necrosis factor- $\alpha$  (TNF- $\alpha$ ), increased acute phase reactants and other mediators, and activation of a network of inflammatory signalling pathways<sup>(2)</sup>. Adipose tissue seems to be the principal inducer of expression and secretion of several mediators of inflammation in obesity. However, the adipose tissue is not the only source of inflammatory molecules in the obese state; there are other organs such as the liver which secrete inflammatory factors<sup>1</sup>. Therefore, the aim of the present study was to analyse inflammatory biomarkers in a cohort of obese prepubertal Spanish children.

Five hundred and ninety children between 6 and 14 years were classified by body mass index according to Cole *et al.*<sup>(3)</sup>. Inflammatory biomarkers were determined after 12 h overnight fasting; weight and height were measured and BMI was calculated. Hepatocyte growth factor, IL-6, IL-8 and TNF- $\alpha$ , were measured by immunoassay, with a MILLIplex™ kit using the Luminex 200 system and CRP was determined with a turbidimetric immunoassay (Dade Behring Inc., USA). One way ANOVA was used to determine statistical differences with a Bonferroni *post hoc* test ( $P < 0.05$ ).

	Normal weight (n = 204)		Overweight (n = 136)		Obese (n = 250)		P value
	Mean	SE	Mean	SE	Mean	SE	
Hepatocyte growth factor ( $\mu\text{g/l}$ )	0.63	0.03 <sup>a</sup>	0.53	0.03 <sup>b</sup>	0.75	0.04 <sup>a</sup>	0.001
IL-6 (ng/l)	4.80	0.60 <sup>a</sup>	4.40	0.70 <sup>a</sup>	7.80	0.90 <sup>b</sup>	0.004
IL-8 (ng/l)	1.60	0.10 <sup>a</sup>	1.70	0.20 <sup>a</sup>	2.30	0.20 <sup>b</sup>	0.003
TNF- $\alpha$ (ng/l)	3.21	0.12 <sup>a</sup>	3.46	0.20 <sup>a</sup>	4.16	0.14 <sup>b</sup>	0.000
CRP (mg/l)	0.54	0.08 <sup>a</sup>	0.93	0.12 <sup>b</sup>	2.44	0.18 <sup>c</sup>	0.000

Different superscript letters in the same row show significantly different values.

The results shown in the table demonstrate that the inflammatory biomarkers are already increased in obese children.

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