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Plasma leptin levels and inflammation biomarkers in well nourished and malnourished haemodialysed patients

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Plasma leptin in haemodialysed patients has different local and systemic pleiotropic effects as uraemic toxin and acute positive phase reactant. Leptin is a potential anorexigen implicated in the malnutrition–inflammation–atherosclerosis (MIA) syndrome in these patients.

The study aims to analyse the influence of the nutritional status and plasma leptin levels on C-reactive protein (CRP) and interleukin-6 (IL-6) in haemodialysed patients.

A sample of 45 patients (68.2 ± 14.5 years) on haemodialysis was analysed. Their nutritional status was evaluated by objective and subjective methods according to the following criteria (percentage ideal body weight, mid arm muscle circumference, triceps skinfold thickness, serum albumin and total lymphocytes). Patients were also classified according to plasma leptin levels (<15 and ≥ 15 ng/ml). CRP and IL-6 were measured by Immunoturbidimetry and ELISA, respectively.

The BMI was similar in well nourished and malnourished patients with <15 ng/ml leptin levels, but significantly higher in the well-nourished patients with ≥ 15 ng/ml leptin levels ($P = 0.02$). Most overweight and obese patients (data not shown) had ≥ 15 ng/ml leptin levels and were well nourished. In patients with <15 ng/ml leptin levels, IL-6 appeared significantly increased ($P = 0.03$), while CRP tended to be increased in malnourished patients in comparison with their well-nourished counterparts ($P = 0.09$). Differences in those inflammatory biomarkers were not significant between well and malnourished patients with ≥ 15 ng/ml leptin levels.

Table 1. CRP and IL-6 levels in haemodialysed patients differing in plasma leptin and nutritional status

	Plasma leptin <15 ng/ml		<i>P</i>	Plasma leptin ≥ 15 ng/ml		<i>P</i>
	Well nourished (<i>n</i> = 11)	Malnourished (<i>n</i> = 13)		Well nourished (<i>n</i> = 14)	Malnourished (<i>n</i> = 7)	
BMI (kg/m ²)	24.3 \pm 3.5	22.4 \pm 2.5	0.14	27.9 \pm 3.9	23.2 \pm 3.9	0.02
CRP (mg/dl)	0.53 \pm 0.3	2.17 \pm 3.04	0.09	1.1 \pm 1.2	0.7 \pm 0.7	0.22
IL-6 (ng/ml)	2.6 \pm 2	6.0 \pm 4.7	0.03	4.8 \pm 3.1	5.3 \pm 3.9	0.74

In conclusion, while malnutrition seems to impair the inflammation in patients with leptinaemia <15 ng/ml, this effect was not observed in their ≥ 15 ng/ml leptin level counterparts. Results suggest that MIA syndrome should be analysed and discussed in the context of plasma leptinaemia in haemodialysed patients.