HIGH SERUM LEPTIN LEVELS ASSOCIATE WITH GOOD NUTRITIONAL STATUS IN NON-OBESE CHRONIC HAEMODIALYSIS PATIENTS

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Objectives:

Leptin is a adipocyte-derived peptide hormone and a member of proinflammatory cytokines which functions to suppress appetite and increase energy expenditure in the healty population. Serum leptin levels are significantly elevated in patients with end stage renal disease (ESRD) primarily due to decreased clearance by kidneys. The role of hyperleptinemia and the influence of serum leptin levels on nutrition-inflammation status in chronic hemodialysis (HD) patients remained to be elucidated. Thus, we aimed to determine the association between serum leptin levels and malnutrition-inflammation status in non-obese chronic hemodialysis patients.

Methods:

Sixty-five patients who were on dialysis between January 1987-January 2013 were included in this cross-sectional study. Patients who had been undergoing HD treatment for at least 3 months, age ≥ 18 years, BMI <25 kg/m² were selected. To minimize the confounding effects of residual renal function on leptin and nutritional markers, we studied only anuric patients. The exclusion criterias were hospitalizations, major surgery, obvious infections or inflammatory disease within the preceding 3 months, end stage liver disease, metastatic malignancies, malabsorbsion syndromes. To determine nutrition-inflammation status; body mass index (BMI), dry weight, triceps scinfold thickness (mm), malnutrition inflammation score (MIS), serum albumin, prealbumin, hs-CRP and TNF-α levels were obtained from all patients. Patients were classified into 3 groups according to the serum leptin levels which adjusted by BMI and gender: Group 1 (low leptin), group 2 (normal leptin), group 3 (high leptin).

Table 1. The demographic features and laboratory findings of the patients according to the three groups of serum leptin levels.

Demographics	Low Leptin (n=9)	Normal Leptin (n=31)	High Leptin (n=25)	P
Age (y)	46.2±16.4	52.7±18.8	52.1±17.4	NS
Sex (male/female)	9/0	18/13	7/18	***0.001***
Duration on HD (months)	76.7±66.0	94.8±74.5	57.7±55.7	NS
Dry weight (kg)	49.6±10.8	55.8±8.5	54.1±8.5	NS
Body mass index (kg/m²)	18.1±1.9	21.3±2.0	21.3±2.8	***0.003***
Delivered dose of dialysis				
Kt/V	1.50±0.20	1.56±0.35	1.76±0.38	NS
Anthropometry				
Triceps skinfold thickness (mm)	9.1±3.2	11.1±4.3	15.4±6.8	***0.003***
Laboratory				
Predialysis urea (mg/dl)	117.0±39.6	135.9±25.1	135.9±28.0	NS
Predialysis creatinine (mg/dl)	7.6±2.7	8.8±2.0	8.4±1.9	NS
Hemoglobin (g/dl)	10.0±2.7	10.7±1.6	10.3±1.7	NS
Uric acid (mmol/L)	5.0±0.6	5.7±1.0	6.0±1.0	NS
Na (mmol/l)	138.1±2.7	138.2±3.0	138.0±2.2	NS
K (meq/L)	4.9±0.8	5.1±0.6	5.0±0.7	NS
Ca (mg/dl)	8.6±0.7	8.7±0.8	8.6±1.1	NS
P (mg/dl)	5.1±2.0	5.4±1.3	5.3±1.3	NS
CaxP	46.2±19.3	48.3±14.6	47.4±15.1	NS
intact PTH (pg/ml)	598.2±864.1	770.8±824.8	424.5±486.2	NS
Total cholesterol (mmol/L)	153.8±47.9	157.5±43.6	183.4±32.7	***0.041***
LDL (mmol/L)	83.0±28.4	92.7±37.0	106.8±35.6	NS
Triglyceride (mmol/L)	128.8±129.2	148.1±64.0	154.8±63.2	NS
Bicarbonate (mEq/L)	23.1±2.0	22.2±2.2	22.4±2.0	NS
Nutrition				
Albumin (g/L)	3.3±0.6	3.8±0.2	3.8±0.3	***0.001***
Prealbumin (mg/dl)	25.1±7.0	26.1±7.0	30.9±8.0	***0.033***
TIBC (g/L)	175.2±26.7	207.9±46.9	218.7±44.4	***0.045***
Malnutrition Inflammation Score (MIS)	10.0±4.3	6.2±2.6	5.8±2.8	***0.002***
Inflammation				
Hs-CRP (mg/L)	25.5±52.4	20.1±26.1	9.6±18.0	NS
TNF-alfa (pg/mL)	22.5±6.7	25.3±9.9	20.5±7.3	NS
Ferritin (ng/ml)	817.7±613.9	632.1±461.2	794.4±457.4	NS

Table 2. Factors corelates with serum leptin levels.

Leptin (ng/L)	p	r
Age (y)	0.028	−0.273
Gender	0.001	-0.665
Body mass index (kg/m²)	0.001	−0.489
Triceps skinfold thickness (mm)	0.001	−0.606
Kt/V	0.028	−0.273
Albumin (g/L)	0.035	−0.263
Prealbumin (mg/dl)	0.031	−0.267
Total cholesterol (mmol/L)	0.002	−0.374
LDL (mmol/L)	0.038	−0.258
Triglyceride (mmol/L)	0.006	−0.339
TIBC (g/L)	0.041	−0.254
Malnutrition Inflammation Score	0.028	-0.272
hs-CRP (mg/L)	NS	-0.215
TNF-alfa (pg/mL)	NS	-0.141

Figure 1. Correlation graphic of leptin and MIS.

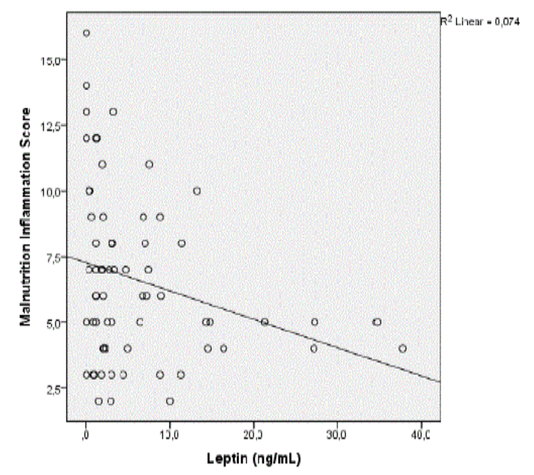

Table 3. Lineer regression analyse of leptin and BMI as a predictor of MIS.

			%95 Confidence Interval			
Predictor	**r**	**Adj R²**	**Lower**	**Upper**	**F**	**P**
Leptin	-0.272	0.059	-0.204	-0.012	5.037	0.028
BMI	0.533	0.273	-0.943	-0.405	25.04	0.001

Results:

Mean age and duration on dialysis of 65 patients (Male/Female: 34/31) were 51.6±17.8 years and 78.0±67.9 months, respectively. Mean leptin levels and malnutrition inflammation scores were 6.2±8.1 ng/mL and 6.6±3.2, respectively. As expected, leptin levels increased with older age, female gender, higher BMI and triceps skinfold thickness. There were no correlation between leptin and duration on haemodialysis. Elevated serum leptin levels were significantly correlated good nutritional status parameters including higher albümin (p= 0.001), prealbumin (p= 0.033), total iron binding capacity (p= 0.045), total cholesterol (p= 0.041) and lower malnutrition inflammation score (p= 0.002). In lineer regression analyse, significantly negative corelattion between serum leptin levels and malnutrition inflammation score remained after adjustment for BMI. No correlation was established between leptin and inflammation parameters including ferritin, hs-CRP and TNF-α.

Conclusions:

Elevated serum leptin levels seems to be associated with good nutritional status. However, the lack of correlation between leptin and inflammatory markers suggests that hyperleptinemia and inflammation are independent events in this population.

References:

1. Sharma K, Considine RV, Michael B, et al. Plasma leptin is partly cleared by the kidney and is elevated in hemodialysis patients. Kidney Int 1997, 51:1980-1985.
2. Kalantar-Zadeh K, Kopple JD, Block G, et al. A malnutrition-inflammation score is correlated with morbidity and mortality in maintenance hemodialysis patients. Am J Kidney Dis 38:1251-1263, 2001.
3. Svobodova J, Haluzik J, Bednarova V, et al. Relation between serum leptin levels and selected nutritional parameters in hemodialysed patients. Vnitr Lek 2001;47:594-8.

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