Leptin as a biomarker in renal cell carcinoma

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Aim:
Definition of the leptin serum levels in newly diagnosed renal cell carcinoma (RCC) and its correlation with histological subtype, tumor stage and grade.

Material and methods:
The total of 113 patients underwent surgery for kidney tumor from September 2011 to March 2013. We have prospectively recorded demographic characteristics and measured laboratory values. Histological examination included determination of the type and size of the tumor, grade and other histological findings. The control group consisted of 50 subjects without presence of malignancy. In all patients, fasting blood testing was performed in the morning before the procedure, the control group was managed in the comparable period. Serum was frozen and the leptin levels were determined by ELISA at the same time. Correlation of serum leptin levels was evaluated by using the nonparametric ANOVA method (Wilcoxon test).

Results:
The average age of the patients was 65 years (22-84), the total of males were 79 patients (70%), mean body mass index (BMI) was 28.2 (18.9 to 38.5), current smokers were 30 patients (26.5%).

Benign tumor was diagnosed in 12 (10.6%) patients, clear cell RCC in 74 (65.5%), papillary and chromophobe RCC in 11 and 5 patients, respectively. A total of 11 patients (9.7%) with generalized RCC underwent cytoreductive nephrectomy. The most common grade for localized RCC was G2 (51.8%), followed by G1 and G3 (both 20%).

Clinical stages I, II, III and IV were detected in 57.1%, 10.2%, 23.5% and 9.2%, respectively. Serum leptin levels were statistically different between the histological subtypes of RCC (p = 0.0419) and between localized and metastatic RCC (p = 0.0324). The leptin levels were also different between the grades of RCC (p = 0.0270) and clinical stages of RCC (p = 0.0323). Serum leptin levels positively correlated with body mass index (BMI). However, BMI did not differ between the tested groups.

Conclusion:
Serum leptin was significantly lower in patients with advanced RCC, the lowest leptin levels were detected in the most aggressive grades. However we were not able to differentiate between patients with localized tumor and negative controls, therefore it seems that leptin is not suitable for renal cell cancer screening but may be effective in active surveillance programs.

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