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EVALUATION OF ADIPONECTIN CONCENTRATIONS IN OBESE CHILDREN AND ITS CORRELATION WITH LIPID AND CARBOHYDRATE PARAMETERS

INTRODUCTION

Biologically active molecules secreted by adipose tissue regulate insulin action and energy metabolism and may contribute to the development of obesity–related disorders. In contrast to most adipocytokines, serum adiponectin concentration lowers as adipose tissue increases which attenuate its beneficial effect on the lipid and carbohydrate metabolism.

THE AIMS of the study was to evaluate the plasma adiponectin levels in obese children depending on children age, gender, stage of puberty and its relationship with lipid and carbohydrate metabolism parameters.

MATERIAL AND METHODS

Study group - 122 obese children (52 girls, 70 boys), aged 5.3-17.9 years (11.6 ± 3 yrs), 52 children in prepubertal and 65 in pubertal period. Obesity was defined using IOTF criteria. Mean BMI was 29.5 **±** 4.9 kg/m2
Control group - 58 healthy children (11.7 ± 3 yrs). Mean BMI 18.7 **±** 2.7 kg/m2.
ANTHROPOMETRIC MEASUREMENTS: including bioelectrical impedance analysis (%FAT).
LABORATORY TESTS: adiponectin concentration (radioimmunoassay method), lipids profile. In obese children oral glucose tolerance test was performed (OGTT). In 26 obese patients adiponectin were taken during OGTT.
HOMA was calculated.
STATISTICAL ANALYSIS (SPSS 19 software): Pearson correlation analysis, T test or Mann-Whitney test, multiple linear regression analysis.

RESULTS

1. The plasma adiponectin levels were significant lower in obese children than in control group (13.1 vs. 15.9 µg/ml; p = 0.004).
2. Slightly lower values were found in obese boys compared to obese girls (12.9 µg/ml vs. 13.4 µg/ml; p = 0.77) and in pubertal children compared to prepubertal children (12.5 µg/ml vs.13.8 µg/ml; p = 0.238) with the lowest values of adiponectin at Tanner stage 3 (9.56 µg/ml). According to gender and pubertal period the changes in adiponectin concentration were observed in the obese boys.
3. The linear regression models showed the negative correlation adiponectin with pubertal period, at Tanner stage 3 (**Table 1**).
4. Adiponectin correlates with HDL cholesterol (r = 0,183, p = 0,047) **(Figure 1**). Logistic regression analysis showed that an increase of 1 unit in adiponectin reduces the risk of lowered <40 mg/dl HDL-C levels by 0.9 times.
5. Adiponectin levels did not appear to be modulated by glucose challenge during OGTT (**Figure 2**).

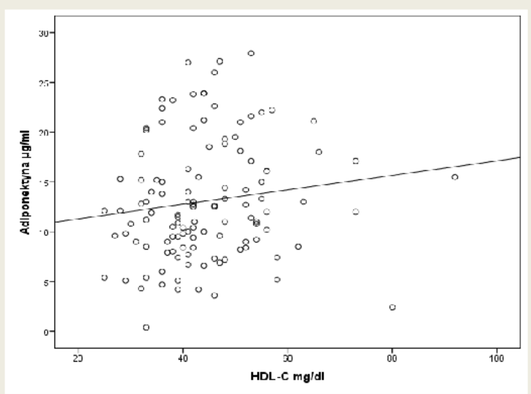

Figure 1.

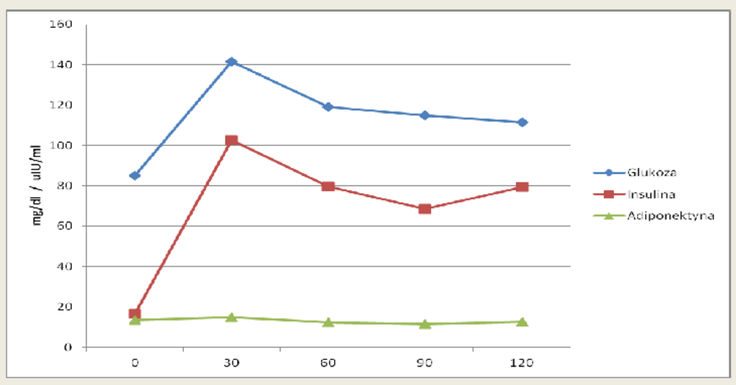

Figure 2.

Models	B	SE	p-valuae
Age	-0.021	0.338	0.949
Gender	-0.210	1.190	0.860
T2	-0.858	2.064	0.676
T3	**-4.131**	**2.052**	**0.046**
T4	0.042	2.287	0.986
T5	-0.121	2.768	0.965
BMI	0.053	0.140	0.708
Gender	-0.274	1.137	0.810
T2	-1.003	1.909	0.601
T3	**-4.404**	**1.758**	**0.014**
T4	-0.465	1.883	0.805
T5	-0.629	1.916	0.744
SDS BMI	0.165	0.389	0.673
Gender	-0.153	1.147	0.894
T2	-0.862	1.896	0.650
T3	**-4.230**	**1.675**	**0.013**
T4	-0.309	1.662	0.853
T5	-0.458	1.713	0.790
WC	0.026	0.062	0.673
Gender	-0.422	1.216	0.729
T2	-1.098	1.945	0.573
T3	**-4.502**	**1.814**	**0.015**
T4	-0.605	2.009	0.763
T5	-0.761	2.028	0.708
%FAT	-0.014	0.069	0.838
Gender	-0.383	1.164	0.742
T2	-0.880	1.919	0.648
T3	**-4.254**	**1.736**	**0.016**
T4	-0.075	1.611	0.963
T5	0.035	1.707	0.984

Adiponectin dependent variable, T = Tanner stage, WC= waist circumferance, SE=standard error

Table 1.

CONCLUSIONS

Sex related differences between plasma adiponectin levels were dependent on puberty stage.
Hypoadiponectinemia in obese children is a risk factor for low HDL-C level.

(The authors declare no conflicts of interest)

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