LEPTIN AND CYTOKINES ARE NOT THE BEST MARKERS FOR METABOLIC SYNDROME

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Introduction

- Leptin, some cytokines and triglyceride/cholesterol -HDL ratio (TG/C-HDL ratio) are markers of insulin-resistance in children and adolescents with overweight/obesity. Due to the high prevalence of this pathology it’s necessary to find an easy and better routinely marker that identify these patients in the outpatient clinic.
- Previous results demonstrated that the TG/C-HDL ratio >2 was a better predictor of metabolic syndrome (sensitivity 100%; specificity 76.7 %) than HOMA or insulin, without differences between sex and pubertal stage (p<0.0001).

Objective

- Define if leptin and some cytokines are better markers of insulin-resistance than TG/C-HDL ratio in the pediatric population with overweight/obesity.

Methods

- Patients with overweight/obesity defined by Orbegozo 2008 were included. Anthropometric variables (body mass index, waist circumference) were measured with standard methods. Sexual maturity was evaluated by Tanner staging.
- Abdominal ultrasound scan was performed to detect liver steatosis.
- Biochemical data: fasting plasma glucose (FPG), 2h OGTT glucose, insulin, HOMA, lipid profile, and C-peptide were analyzed. Cut off point was considered >95th percentile of each variable. Metabolic syndrome was diagnosed according to criteria of Diabetes International Federation.
- Leptin, adiponectin and osteocalcin were analyzed by enzymoimmunoanalysis. SPSS.19 was used for statistical analysis.

Results

- 110 patients (2-17 years of age) were included, 40% boys and 44.6% pubertal.
- Clinical and biochemical data are represent in Table 1.

<table>
<thead>
<tr>
<th>Population characteristics</th>
<th>Mean (Standard Deviations)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year old)</td>
<td>10,01 (3,01)</td>
<td>201 - 17</td>
</tr>
<tr>
<td>Body Mass Index (Kg/m2)</td>
<td>27,77 (4,11)</td>
<td>19,4 - 36,98</td>
</tr>
<tr>
<td>Standard Deviations BMI</td>
<td>4,40 (1,53)</td>
<td>2 - 8,17</td>
</tr>
<tr>
<td>Waist Circumference (cm)</td>
<td>85,61 (11,08)</td>
<td>60,0 - 113,0</td>
</tr>
<tr>
<td>TG/C-HDL</td>
<td>2,07 (1,9)</td>
<td>0,28 - 13,03</td>
</tr>
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</table>

- There is a positive correlation between TG/C-HDL ratio and
  - HOMA r = 0.358  p 0.01
  - Leptin r = 0.301  p 0.04
  - Osteocalcin r = 0.287  p 0.06

- There is a negative correlation between TG/C-HDL ratio and
  - Adiponectin r = -0.272  p 0.09.

- Those patients (35) with TG/C-HDL ratio >2 have higher levels of leptin ( p 0.02 )
- Leptin nor cytokines levels were not correlated with liver steatosis but interestingly patients with this liver disease have significant higher values of the TG/C-HDL 3.35 vs TG/C-HDL 1.5 ( p 0.027 ).

Conclusions

- Due to differences in standard values of leptin and cytokines related to age, sex and pubertal stage, TG/C-HDL ratio>2 could be and effective and simple tool to identify the early stage of potential metabolic syndrome in overweight/obese pediatric population at any age and pubertal stage, avoiding expensive resources.