Effect of three-month diet and physical activity on adipokines and inflammatory status in children with metabolic syndrome

Ramona Stroescu, Otilia Mărginean, Teodora Bazona, Mihai Galencu, Gabriela Doria
Emergency Hospital for Children "Louis Türcanu", Timișoara, Romania
University of Medicine and Pharmacy "Victor Babes", Timișoara, Romania

Abstract: The prevalence of metabolic syndrome (MetS) in young population continues to rise. Obesity is a chronic inflammatory disorder in which leptin, adiponectin and C reactive protein (hs-CRP) play an important role. This study aimed to determine whether these adipokines are significant markers in defining MetS in pediatric population and to assess the effect of hypocaloric diet and physical activity on serum concentrations of adiponectin, leptin, and high sensitivity CRP (hs-CRP). Material and Methods: A prospective study was conducted over a period of 1 year, between January 2015 and December 2016, on 66 cases of obesity in children diagnosed at the Louis Türcanu Emergency Hospital for Children Timișoara. The patients diagnosed with MetS were put on diet and physical exercise for 3 months. Results: MetS was present in 65.6% of obese children. There was a significant and positive correlation between MetS and both leptin and hs-CRP, and a significant, negative correlation between MetS and adiponectin. After diet and physical activity 3 patients no longer met the criteria for MetS. Leptin, adiponectin and hs-CRP concentrations statistically improved after a three-month diet and physical activity program. Conclusions: hs-CRP, leptin and adiponectin can be used as predictors of cardiovascular risk in pediatric population. Diet and physical activity have an impact on the metabolic status.

Keywords: adipokines, leptin, hs-CRP, child obesity

Material and Methods

This study aimed to investigate the relationship between markers of adiposity like leptin, adiponectin and hs-CRP in obese children, and to determine whether these adipokines are significant markers in defining MetS in pediatric population; a further goal was to assess the effect of hypocaloric diet on serum adiponectine, leptin, and hs-CRP concentrations. We tested the hypothesis that long-term lifestyle changes and moderate weight loss would reduce the plasma concentrations of adipokines involved in inflammation, angiogenesis, and chemotaxis and would increase adiponectin concentrations.

Material and methods:

A prospective study: 1 year (January 2015 and December 2016) 66 cases of obesity in children diagnosed at the Louis Türcanu Emergency Hospital for Children Timișoara.

Results and Discussions

42 out of 66 patients met the criteria for MetS. They were put on diet and physical activity over a period of 3 months. Anthropometric and biological changes are shown in Table 3.

Table 3 - Anthropometric and biological changes following diet and physical activity

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Baseline</th>
<th>After 3 Months</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI kg/m²</td>
<td>31.98±3.31</td>
<td>29.96±4.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Adiponectin ng/ml</td>
<td>2.75±2.70</td>
<td>3.07±2.40</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>hs-CRP mg/dl</td>
<td>9.95±6.27</td>
<td>7.96±6.16</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>MetS</td>
<td>42</td>
<td>37</td>
<td>0.72</td>
</tr>
</tbody>
</table>

This research was supported by a grant at Victor Babes University of Medicine and Pharmacy Timişoara PI-ID-02-TC-2014 ChildObesity-2014 obtained by Ramona Stroescu.

Material and Methods

A prospective study was conducted over a period of 1 year, between January 2015 and December 2016, on 66 cases of obesity in children diagnosed at the Louis Türcanu Emergency Hospital for Children Timișoara.

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Discussion

Obesity is a chronic inflammatory disorder, in which leptin, adiponectin and CRP play an important role.

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