Long-term Prednisone versus Hydrocortisone Treatment in Children with Classic Congenital Adrenal Hyperplasia (CAH): A Controlled Study

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Introduction

- Debate still exists about the safety of long-term use of Prednisone (PD) versus Hydrocortisone (HC) for treating children with CAH.
- The mechanism by which glucocorticoid therapy interferes with growth is complex and multifactorial.
- Relatively slight supraphysiologic levels may be enough to blunt growth velocity, increase weight gain.

Objectives

- To evaluate the anthropometric and biochemical effects of long-term PD versus HC treatment in children with CAH-210HD.

Methods

- We studied 30 children with classic CAH (19 females and 11 males), 22 were on PD and 8 were on HC treatment, since their first diagnosis.
- Clinical data included age, gender, duration of therapy, the dose of HC and or equivalent dose of HC in the PD group, blood pressure, height (Ht) and weight. Ht-SDS and BMI were also calculated.
- Biochemical data included measurement of 17-OH progesterone, cholesterol, triglycerides (TG), HDL, LDL, fasting glucose, and insulin concentrations. HOMA-IR was calculated.
- Carotid intima-media thickness (CIMT) was measured using high-resolution B-mode ultrasonography.
- Thirty normal age-matched children were used as controls for the anthropometric and CIMT data.

Results

- The age of children and duration of treatment did not differ among the two treatment groups. After a mean of 6 years of treatment, the Ht-SDS and BMI did not differ between the three groups of children.
- The equivalent hydrocortisone dose of children on prednisone was significantly Higher than the dose for the hydrocortisone group.
- Both systolic and diastolic blood pressures (BP) of children on prednisone was slightly higher compared to those on the HC group. However, the BP of the 2 treatment groups was not different compared to control children.

Comparison of different variables between cases of CAH and controls

<table>
<thead>
<tr>
<th>Variables</th>
<th>Type of steroid treatment</th>
<th>P1*</th>
<th>p2*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HC</td>
<td>PD</td>
<td>Control</td>
</tr>
<tr>
<td>Age at presentation (mm)</td>
<td>3.9</td>
<td>6.7</td>
<td>4.5</td>
</tr>
<tr>
<td>Age (years)</td>
<td>7.4</td>
<td>6.4</td>
<td>6.2</td>
</tr>
<tr>
<td>Systolic BP mmHg</td>
<td>96.5</td>
<td>98.5</td>
<td>97.4</td>
</tr>
<tr>
<td>Diastolic BP mmHg</td>
<td>61.3</td>
<td>63.9</td>
<td>63</td>
</tr>
<tr>
<td>WSIDS at presentation</td>
<td>-0.99</td>
<td>-1.1</td>
<td>-0.5</td>
</tr>
<tr>
<td>Height SDS (± SD)</td>
<td>-0.3</td>
<td>-0.7</td>
<td>-0.25</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>19.0</td>
<td>18.7</td>
<td>19.8</td>
</tr>
<tr>
<td>Total daily dose (mg/m²/day)</td>
<td>15.2</td>
<td>5.5</td>
<td>ND</td>
</tr>
</tbody>
</table>

P1: Hydrocortisone versus Prednisone; P2: Patients versus controls

- Fasting blood glucose, HOMA-IR, plasma TG, HDL, and cholesterol did Not differ among the two treatment groups.
- LDL levels were significantly Higher in the PD group versus the HC group.
- CIMT did Not differ among the two treatment groups but was significantly higher in the treated groups versus controls.
- There was a significant linear correlation between BMI-SDS and CIMT (r= 0.37, p = 0.047).

Conclusions

- No difference in Ht-SDS, BMI, HOMA-IR, or CIMT was detected among the two treated groups.
- The efficiency, safety and convenience of a single daily dose of PD could be a good and relatively safe alternative to HC for the continuing treatment of CAH children.