Timing of GH peak in provocation tests is important in predicting the effectiveness of treatment with rhGH in prepubertal children with GHD

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Introduction

Peak Growth Hormone (GH) level during stimulation tests (STs) stands as an important parameter in growth prediction models and relatively recent it was shown that timing of the peak value in glucagon stimulation test (GST) may be an important indicator of growth hormone deficiency (GHD). Moreover, weak evidence exists of a possible relationship between GH peaking at atypical times in arginine stimulation tests and decreased growth response in treatment with rhGH.

The aim of this study was to detect a possible relationship between timing of the peak value of GH during STs and the effectiveness of treatment with rhGH in children with idiopathic GHD deficiency (iGHD).

Patients and Methods

Study group (n=92)

Females

38%

62%

Males

Prepubertal

70.7%

29.3%

Pubertal

Results

Retrospectively study of patients with iGHD inclusion criteria were:
- Diagnosis of GHD confirmed by 2 provocation tests (GHmax<10ng/ml)
- All possible causes of GHD excluded (iGHD)
- Patients completed at least one-year follow-up.

92 (57 boys and 35 girls) patients with iGHD were fulfilling the above criteria. Mean decimal age at diagnosis: 9.93 ± 3.17 years.

Standard Deviation Scores for auxological parameters were calculated according to sex- and age- matched population according to the WHO reference population. Observed and predicted (according to KIGS Prediction Model) height velocity (HV) during the first year of treatment and the index of responsiveness (IoR) were calculated for the prepubertal children (n=65).

Glucagon Stimulation Test

Prepubertal Patients

IoR was lower in the prepubertal patients who had “atypical” GST with a difference that was approaching significance.

Clonidine Stimulation Test

Prepubertal Patients

IoR was lower in children with “atypical” CST compared to children with “typical” CST

Conclusions

- The presence of atypical GH stimulation test correlates with lower response in the rhGH treatment of prepubertal children with GHD
- The timing of GH peak in provocation tests is important for the prediction of the effectiveness of treatment with rhGH in prepubertal children with iGHD and consequently for the tailoring of the treatment dose.

Total number of atypical tests

| Parameter | 2 atypical | 1 atypical | No atypical | P
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<tr>
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</thead>
<tbody>
<tr>
<td>Prepubertal</td>
<td>6/7</td>
<td>18/23</td>
<td>43/62</td>
<td>0.603</td>
</tr>
<tr>
<td>Predicted Height Velocity</td>
<td>10.87 ± 0.68</td>
<td>9.84 ± 0.81</td>
<td>10.10 ± 1.00</td>
<td>0.077</td>
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<tr>
<td>Height Velocity (1st year treatment)</td>
<td>7.37 ± 0.67</td>
<td>7.03 ± 1.29</td>
<td>7.89 ± 1.54</td>
<td>0.116</td>
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<tr>
<td>IoR</td>
<td>-2.09 ± 0.66</td>
<td>-1.64 ± 0.61</td>
<td>-1.29 ± 0.07</td>
<td>0.045</td>
</tr>
</tbody>
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GH and ISF Treatment

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