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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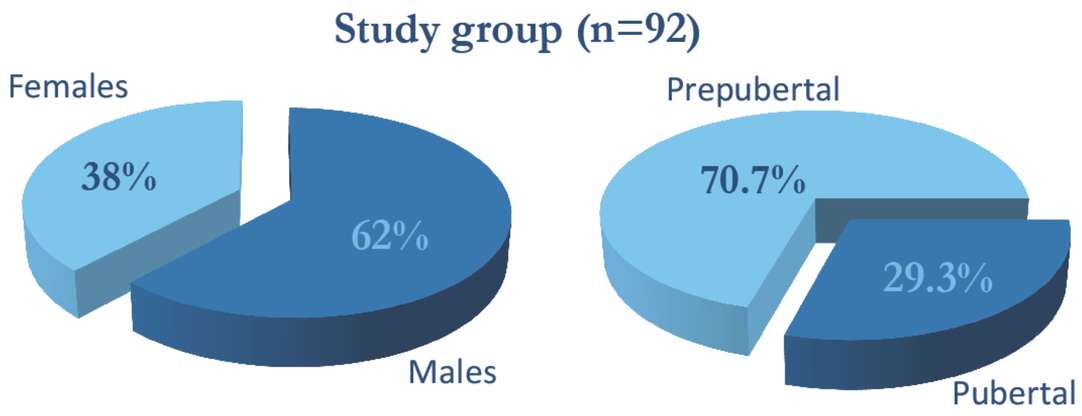
Disclosure Statement: none of the authors have a conflict of interest. **Funding:** This study received no funding.

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 GH deficiency (iGHD).

Patients and Methods



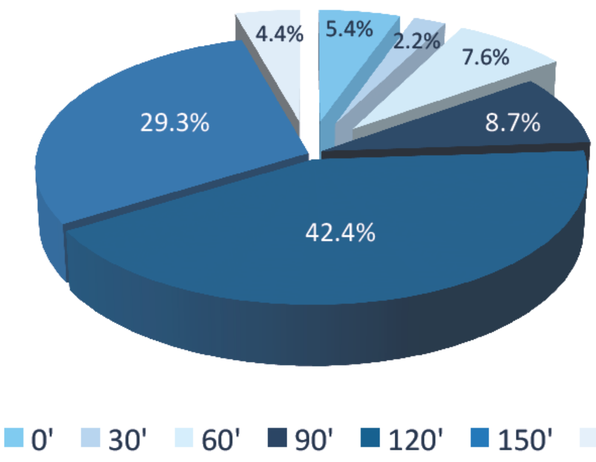
Retrospectively study of patients with iGHD. Inclusion criteria were:

- 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 criteri. 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 prepuberdal children (n=65).

Results

Typical: 90΄, 120΄, 150΄
Atypical: 0΄, 30΄, 60΄, 180΄

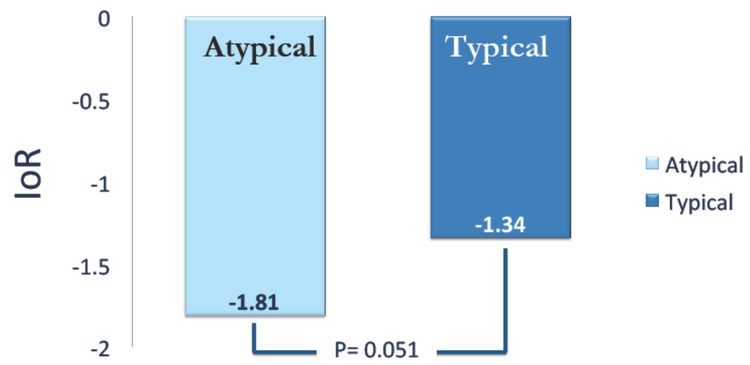


18 patients (19.8%) had "atypical" GST

Glucagon Stimulation Test

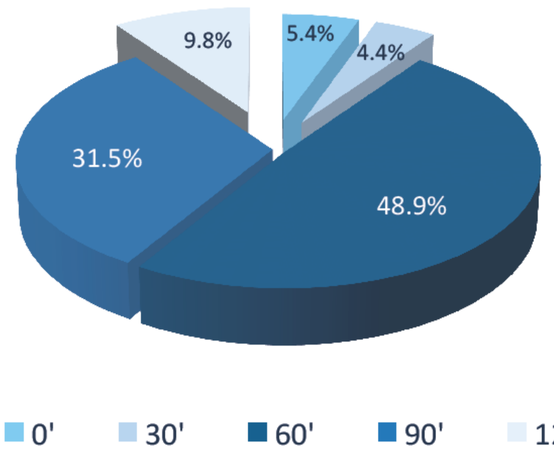
Prepubertal Patients

Parameter	Atypical	Typical	P
Prepubertal	15/18	50/74	0.188
Predicted Height Velocity	10.17 ± 0.89	10.09 ± 0.98	0.782
Height Velocity (1st year treatment)	7.05 ± 1.05	7.79 ±1.55	0.089
IoR	-1.81 ± 0,67	-1.34 ± 0.85	0.051



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

Typical: 60΄, 90΄
Atypical: 0΄, 30΄, 120΄

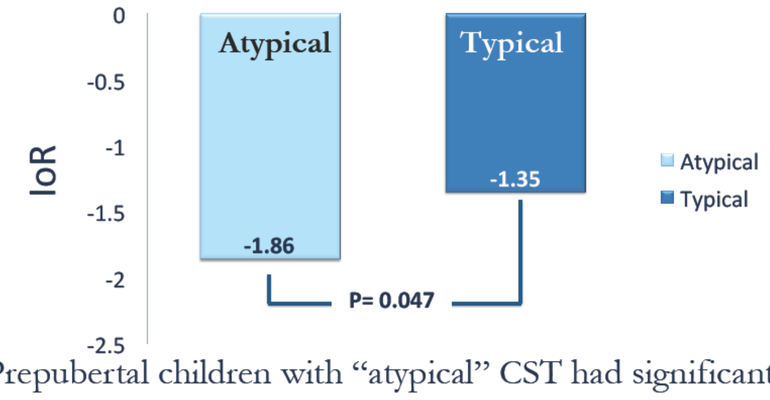


18 patients (19,6%) had "atypical" CST

Clonidine Stimulation Test

Prepubertal Patients

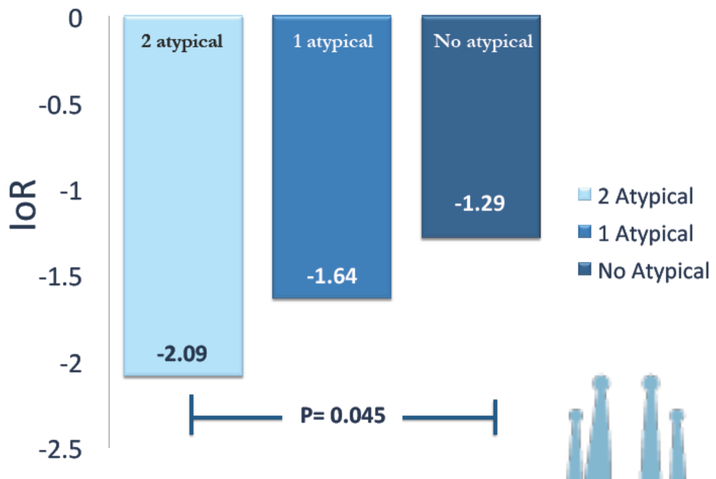
Parameter	Atypical	Typical	P
Prepubertal	13/18	52/74	0.811
Predicted Height Velocity	10.42 ± 0.93	9.76 ± 0.95	0.189
Height Velocity (1st year treatment)	7.23 ± 1.33	7.71 ± 1.51	0.294
IoR	-1.86 ± 0.66	-1.35 ± 0.84	**0.047**



Prepubertal children with "atypical" CST had significantly lower IoR compared to children with "typical" CST

Total number of atypical tests

Parameter	2 Atypical	1 Atypical	No Atypical	P
Prepubertal	6/7	16/23	43/62	0.661
Predicted Height Velocity	10.87 ± 0.68	9.84 ± 0.81	10.10 ± 1.00	0.077
Height Velocity (1st year treatment)	7.27 ± 1.07	7.03 ± 1.29	7.89 ± 1.54	0.116
IoR	-2.09 ± 0.68	-1.64 ± 0.61	-1.29 ± 0.87	**0.045**



Conclusions

- The presence of atypical GH stimulation test correlates with lower response in the rhGH treatment of prepubertal children with iGHD
- 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.

54th Annual Meeting of ESPE – 1-3 October 2015 – Barcelona

ESPE 2015 424--P2

GH and IGF Treatment

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DOI: 10.3252/pso.eu.54espe.2015

Poster presented at: 54th Annual Meeting 1-3 October ESPE 2015 BARCELONA European Society for Paediatric Endocrinology

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