

Bone age maturation during three years of growth hormone therapy in patients with idiopathic growth hormone deficiency : the results of LG Growth Study

Young Suk Shim¹, Il Tae Hwang¹, Seung Yang¹, Eun Young Kim²

¹Department of Pediatrics, Hallym University School of Medicine, Seoul, Korea

²Department of Pediatrics, Chosun University School of Medicine, Gwangju, Korea

INTRODUCTION

- GH and IGF-I are traditionally considered as potent stimulators of bone growth.
- After GH treatment in children with GH deficiency (GHD), increased serum level of IGF-I or GH itself can stimulate growth plate and results in progression of bone age (BA), however, its progression rate has been reported various.

The purpose of this study

- ✓ To investigate the progression of BA in children with idiopathic GHD (iGHD) and idiopathic short stature (ISS) during the first three years of GH treatment based on a LG Growth Study
- ✓ To compare the progression rate of BA relative to chronologic age (CA) between iGHD and ISS and to find their associated factors

SUBJECTS & METHODS

iGHD diagnostic criteria

- height percentile below 3rd
- peak GH levels < 10 µg/L in two stimulation tests
- the BA delay compared to the CA
- normal brain MRI

ISS diagnostic criteria

- height percentile below 3rd
- normal GH responses in two stimulation tests
- no identifiable diseases related to short stature

Inclusion criteria in this study

- prepubertal status at baseline
- GH treatment for at least 3 years
- at least one BA obtained per year during follow-up period

Ht-, Wt-, and BMI-z score, BA, BA-CA



Statistics by SPSS software (version 21.0, IBM)

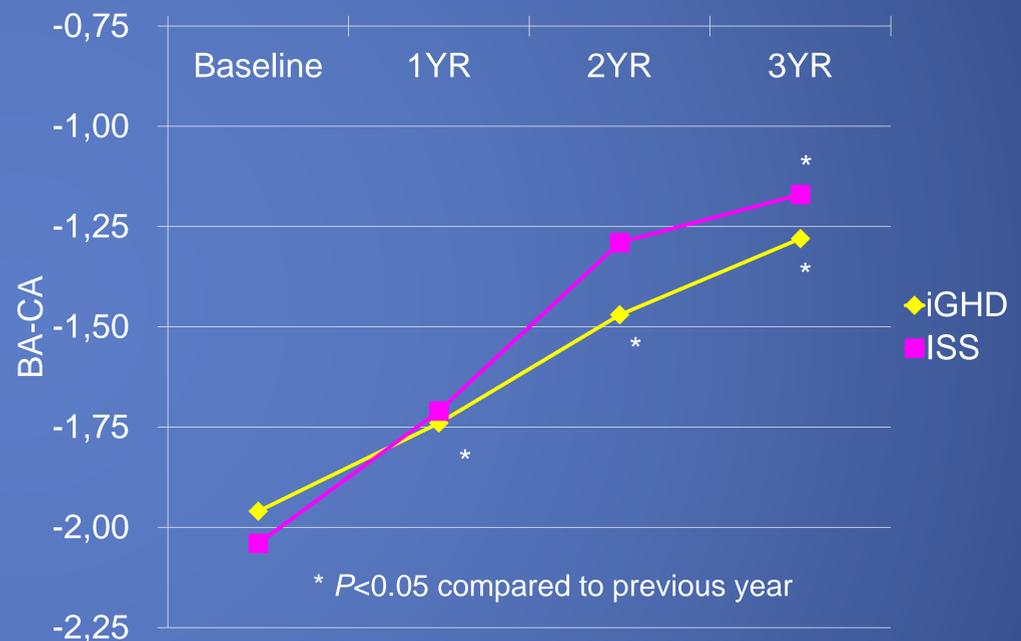
- Data expression: mean±SD
- Serial changes of parameters: ANOVA
- Associated factors of BA-CA at 3 year GH Tx: t-test, Pearson's correlation, logistic regression analysis
- P-value <0.05: significant

RESULTS

Table 1. Baseline characteristics of subjects

	iGHD (n=79)	ISS (n=14)
Sex (M:F)	48:31	8:6
Age	7.77±2.77	8.14±2.97
Ht z-score	-2.45±0.66	-2.60±0.62
BMI z-score	-0.24±1.07	-0.28±0.93
BA-CA	-1.96±0.96	-2.04±1.25

Figure 1. Mean values of BA-CA changes during 3 years of GH treatment in subjects with iGHD and ISS



- Significant factors affecting to BA-CA at 3YR GH Tx in subjects with iGHD ⇒ BA-CA at 1YR GH Tx

	BA-CA < -1.00 (n=46)	BA-CA ≥ -1.00 (n=33)
BA-CA at 1YR GH Tx	-2.10±0.80	-1.24±1.21

- significant by multiple logistic regression analysis

SUMMARY & CONCLUSION

- The BA maturation was accelerated relative to the progression of CA during 3 years of GH treatment in children with iGHD.
- The BA acceleration rate at 1 year GH treatment affected to the BA-CA at 3 year GH treatment.
- In conclusion**, the progression rate of BA during GH treatment is significant although clinically acceptable, therefore, this factor must be considered when efficacy of GH treatment is evaluated.