

# The effect of two different GH dosages on final height and bone geometry

## Introduction

Growth hormone (GH) has a strong positive influence on bone stimulating both bone elongation and increase in size by enhancing the accrual of trabecular and cortical bone up to the attainment of peak bone mass in young adult.

## Objectives

We compared the effect of two different GH dosages on statural growth and bone geometry in two groups of GH-deficient children at final height. Data has been collected retrospectively from 1994 to 2013.

## Methods

We evaluated 121 (86 males, 35 females) children of two different cohorts. Group 1 (44 patients) had been treated with GH at a mean dose of 0.3 mg/kg/week and group 2 (77 patients) at 0.2 mg/kg/week.

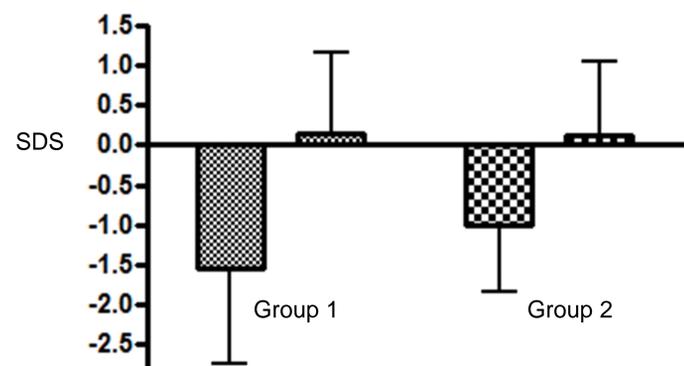
The auxological data were collected at the beginning (Height 1) and at the end of treatment (Height 2). A digitalized X-ray obtained at final height for the determination of bone age was used to study bone geometry.

## Results

Height was corrected for mid-parental height (parentally adjusted height SDS), while the following parameters were employed to assess bone geometry: metacarpal index (MI), cross-sectional area (CSA), cortical area (CA) and medullary area (MA).

Height (SDS): at the beginning of treatment was significantly shorter in group 1 than in group 2 (-1.54 vs -1.01;  $p < 0.005$ ), while at the end of treatment there was no difference between the 2 groups (0.15 vs 0.11). Height gain was significantly higher in group 1 than in group 2 (1.62 vs 1.13;  $p < 0.001$ ).

Height Gain in Group 1 and in Group 2



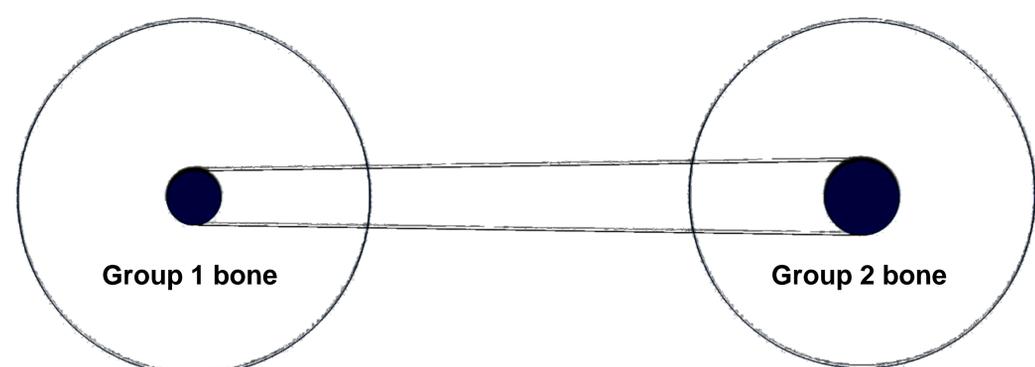
Auxological parameters

Group	Height 1 (SDS)	Height 2 (SDS)	GAIN
1	-1.54 ± 1.14	0.15 ± 1	1.62 ± 0.69
2	-1.01 ± 0.83	0.11 ± 0.94	1.13 ± 0.70
p	<0.005	NS	<0.001

Bone geometry: MI was significantly greater in group 1 (0.62 vs 0.55;  $p < 0.001$ ) as well as CA (46.87 vs 42.69;  $p < 0.005$ ), while MA was significantly lower in group 1 (8.48 vs 11.65;  $p < 0.002$ ). There was no difference in total cross sectional area.

Bone geometry parameters

Group	MI	CA (mm)	MA (mm)	CSA (mm)
1	0.62 ± 0.07	46.87 ± 9.39	8.48 ± 3.87	55.35 ± 11.14
2	0.55 ± 0.07	42.69 ± 8.39	11.65 ± 4.65	54.34 ± 11.66
p	<0.001	<0.005	<0.002	NS



## Conclusions

Higher GH doses elicit a significantly greater statural gain and an improvement of the bone geometry by stimulating the growth of the cortical area

## References

1. Influence of two different GH dosage regimens on final height, bone geometry and bone strength in GH-deficient children. Radetti G, D'Addato G, Gatti D, Bozzola M, Adami S. Eur J Endocrinol. 2006 ar;154(3):479-82.