

ESTIMATION OF FGF21 CONCENTRATION IN PREPUBERTAL CHILDREN WITH GROWTH HORMONE DEFICIENCY BEFORE AND AFTER 6 MONTHS OF GROWTH HORMONE TREATMENT

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Background and Aim

Fibroblast growth factor 21 (FGF21) is a metabolic and growth regulator. The growth-promoting effect of GH in GHD children depends on many factors. FGF21 concentration in GHD and its interaction with growth deficiency and growth response to GH was not examined, however there are data suggesting that FGF21 influences growth (1,2,3).

To estimate the FGF21 concentration and its correlation with degree of growth deficiency and growth response in non-obese, prepubertal children with isolated GHD before (GHD untreated group) and after 6 months of GH therapy (GHD after 6 m group).

Materials and Methods

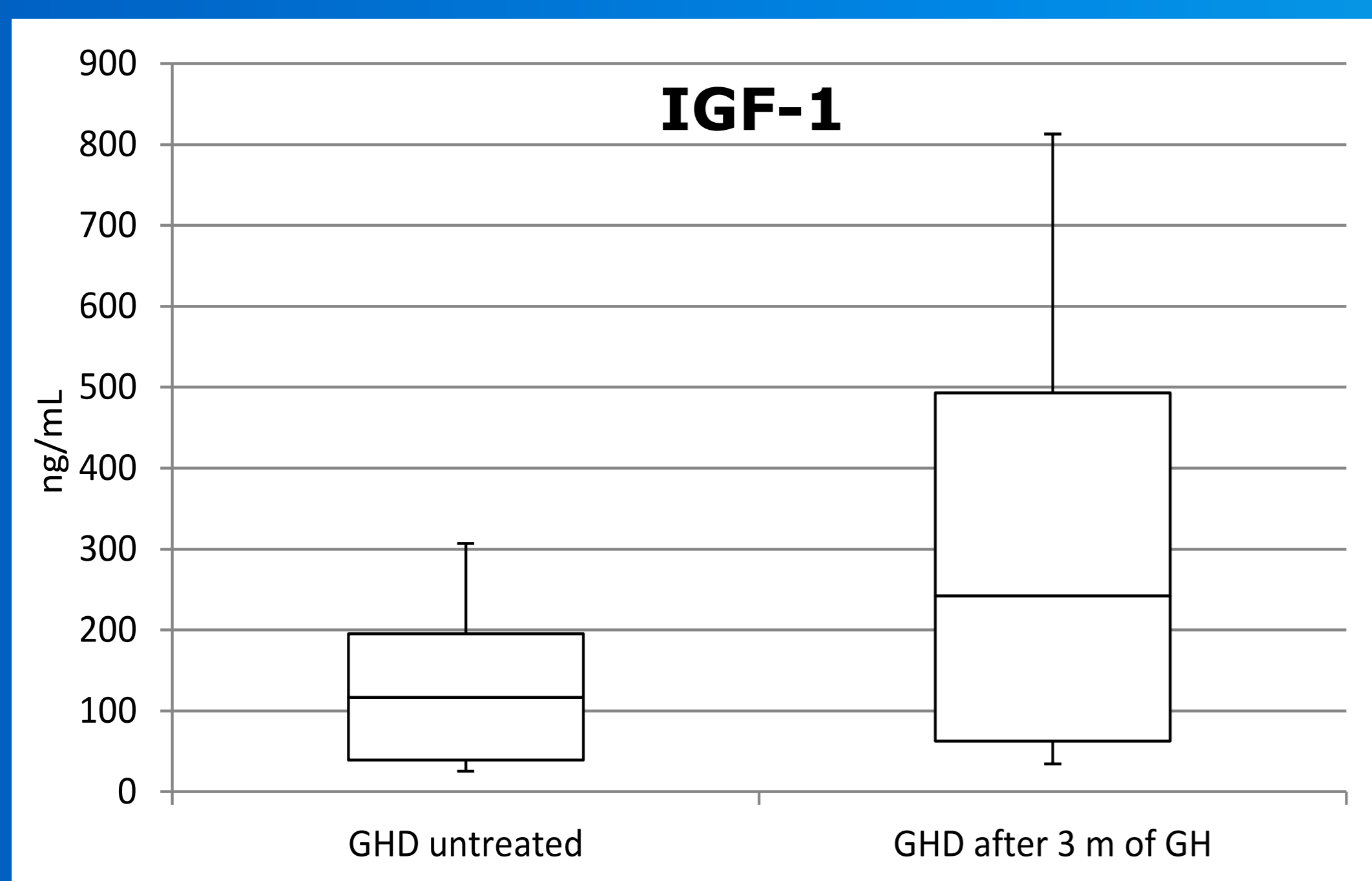
- 32 (22 boys, 10 girls) non-obese, short children with GHD (mean height 117.9 cm, -2.77 SD, mean BMI -0.75 SD), mean age 8.87 years.
- 18 (11 boys, 9 girls) age matched healthy children (mean height 125.8 cm, -0.93 SD, mean BMI -0.28 SD), control group (CG)
- Serum fasting FGF21 was measured in all and in GHD after 6 months.
- In GHD children IGF1 concentration was measured before and after 3 months of GH therapy.
- GHD patients were divided into subgroups dependently on degree of growth deficiency before GH: A < median height SD and B > median height SD.
- In statistical analysis t-Student and U Mann - Whitney tests were applied.

Results

- The median concentration of FGF21 did not differ significantly between CG, GHD untreated and GHD after 6 m, however in CG it was lower than in GHD (median: 94,1 pg/mL in CG vs. 99,8 pg/mL before GH and 133 pg/mL after 6 m GH).
- IGF1 was significantly higher after 3 m of GH (242 ng/mL vs. 116,4 ng/mL).
- FGF21 after 6 m correlated with height SD after 6 m: the higher FGF21 after 6 m the more profound growth deficiency ($r=-0,50$, $p<0,05$).
- Stepwise discriminant analysis showed that FGF21 and IGF1 are differentiating features between A and B subgroup (canonical factor: 0,49).
- In subgroup A FGF21 was higher than in subgroup B.
- FGF21 before GH was higher in subgroup A than in subgroup B with border significance (median 111 pg/mL vs. 84,5 pg/mL, $p=0,07$) while FGF21 in subgroup A after 6 m of GH was significantly higher (median FGF21 174,5 pg/mL vs. 94,1 pg/mL, $p<0,05$).
- IGF1 was significantly lower in group A than in B both before and after 3 months of GH therapy.

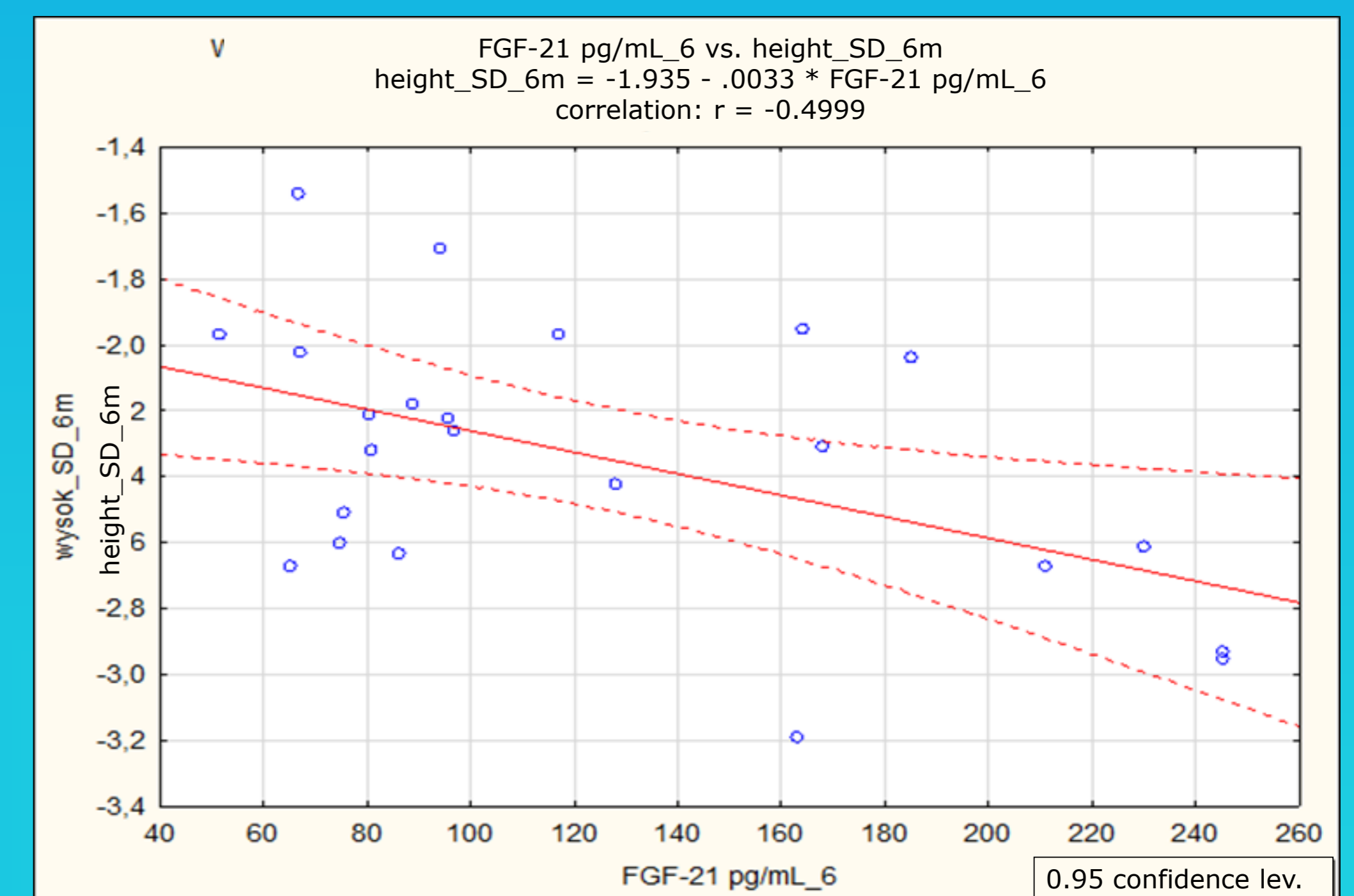
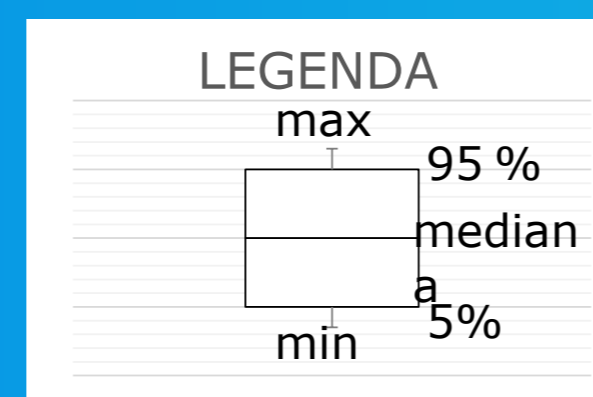
FGF 21 (pg/mL)

	Mean	Median	Minimum	Maximum	Percentile 5%	Percentile 95%	Std. Dev.
GHD untreated	137	99,8	40,5	362	54,9	326	90,1
GHD after 6 m of GH	163	133	51,6	949	65,2	317	158
Control Group	435	94,1	51,1	2268	51,1	2268	749



$p < 0.00001$

Differences not statistically significant



$p < 0.05$

FGF21 pg/mL (mean, median, SD)		Subgroup A < median height SD	Subgroup B > median height SD	Statistical Significance
		GHD untreated	163; 111; 99,6	112; 84,5; 73,9
GHD after 6 m of GH		169; 175; 71,8	105; 94,1; 42,1	$p<0,05$
IGF1 ng/mL (mean, median, SD)	GHD untreated	93,2; 90; 40,1	139,6; 137; 63,9	$p<0,05$
	GHD after 3 m of GH	186,5; 183; 90,8	297,9; 265,5; 196,2	$p<0,05$

Conclusion

FGF21 has a potential negative impact on stature growth in GHD children.

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