

Bone Health Index is low at diagnosis of growth hormone deficiency, and improves during growth hormone therapy

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Background

- BoneXpert software calculates bone health index (BHI) from cortical thickness and mineralisation of three metacarpals (Figure 1)
- Strong correlations between BHI and dual-energy x-ray absorptiometry (DXA) and peripheral quantitative computed CT (pQCT) measurements are reported
- Low bone mineral density (BMD), measured by DXA, and improvement with growth hormone (GH) is described in childhood GH deficiency (GHD).

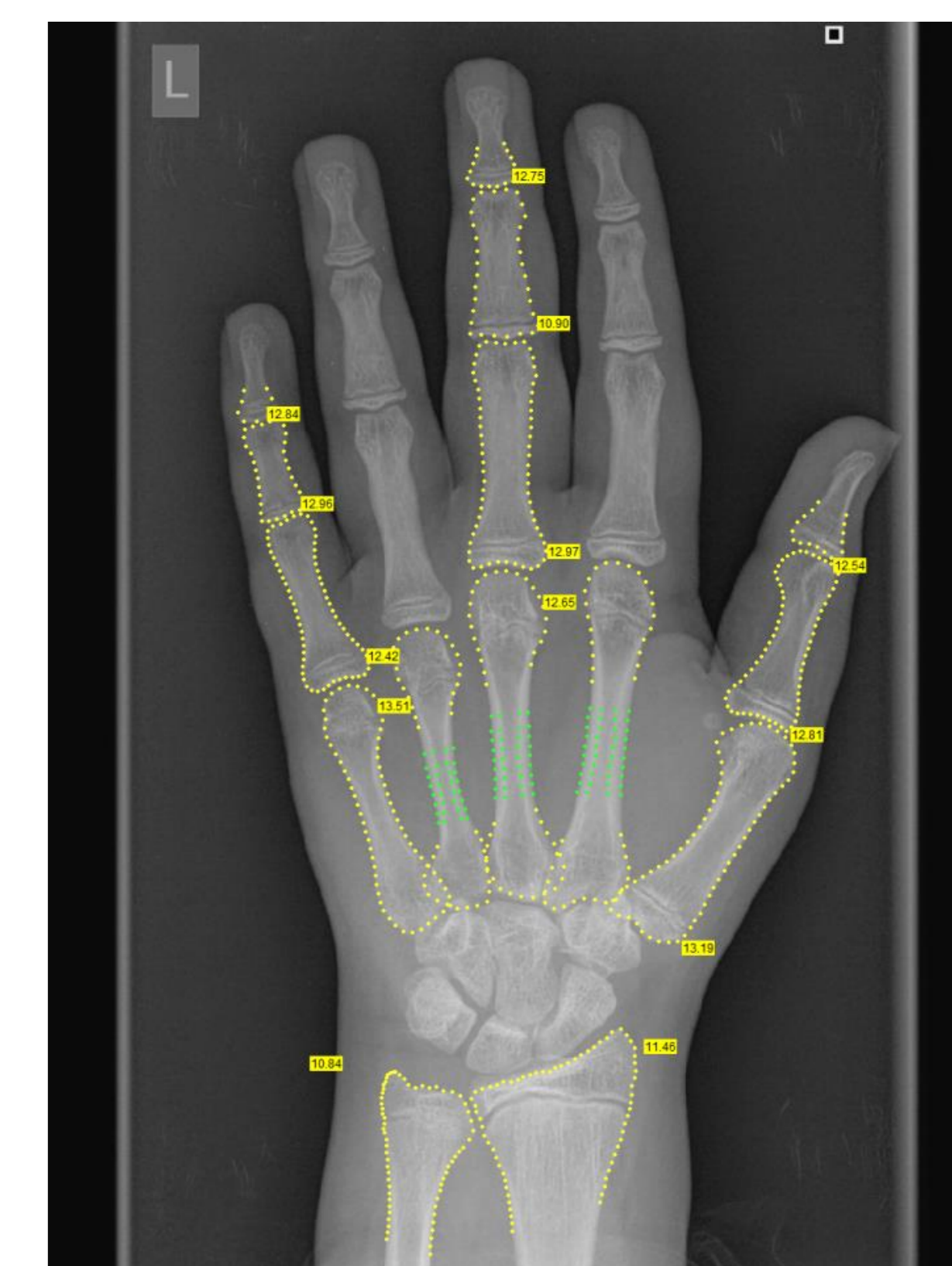


Figure 1: Hand and wrist x-ray illustrating points of analysis for BHI

Aim

- To describe BHI SDS at diagnosis of GHD and after one year of treatment.

Methods

- Children with GH diagnosed between 2005 and 2016 were identified.
- Children with additional diagnoses or medications that may affect BHI were excluded.
- Change in baseline parameters was determined by paired t-test
- Associations between parameters examined using Pearson correlation.

Results

- Patient characteristics at baseline, and following 1 yr of treatment are given in Tables 1 and 2.
- BHI SDS at diagnosis was related to IGF-I SDS ($p=0.02$).
- Δ BHI SDS inversely related to height SDS ($p=0.04$) and BHI SDS at diagnosis ($p<0.001$).

Conclusion

- These data are consistent with previous reports of the effect of GH on BMD
- Our data lend support to the use of BHI, a for the identification and monitoring of children at risk of impaired bone health.

Table 1: Characteristics of 120 patients at diagnosis of GHD

Factor	N	Mean (SD) or N (%)
Age (yrs)	120	11.6 (3.5)
Gender: Female	120	31 (26%)
Male		90 (74%)
Height SDS	120	-2.43 (0.94)
Bone age delay	99	1.9 (1.5)
BHI SDS	85	-1.06 (1.04)
IGF-I SDS	114	-2.45 (1.25)
Peak GH (mcg/L)	116	3.6 (1.7)
GH dose ($\mu\text{g}/\text{kg}/\text{day}$)	120	28.4 (3.7)

Table 2: Change in height and BHI SDS, and bone age delay after 1yr treatment for GHD

Factor	N	Change Mean (95% CI)	P-value
Height SDS	114	0.71 (0.61, 0.80)	<0.001
Bone age delay	85	-1.2 (-1.5, -0.9)	<0.001
BHI SDS	67	0.80 (0.58, 1.02)	<0.001



Inspired by children

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