Bone status, quality and structure in a patient with IGF-I receptor deletion syndrome

INTRODUCTION AND OBJECTIVES

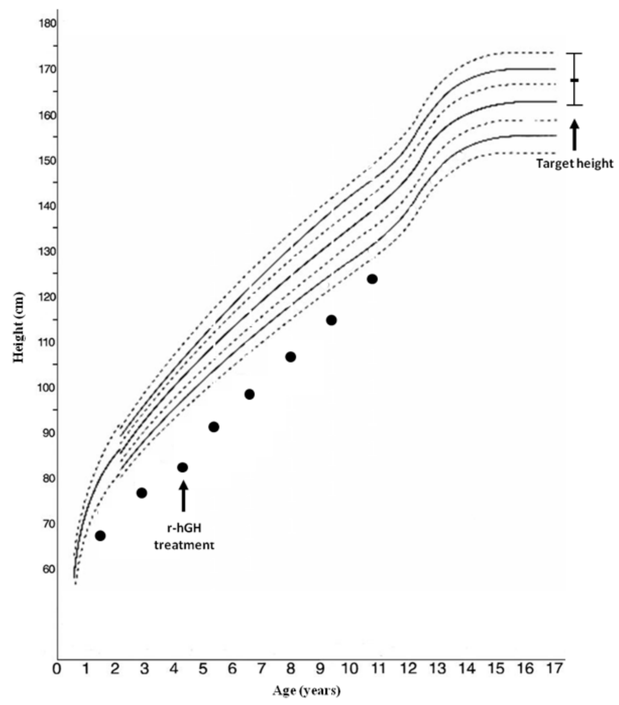
Various aspects of *IGF1R* defects have been analyzed to date, but the effects of *IGF1R* haploinsufficiency bone status and metabolism were rarely investigated. To study bone metabolism and structure in a case of *Insulin-like growth factor-I (IGF-I) receptor* (*IGF1R*) gene deletion.

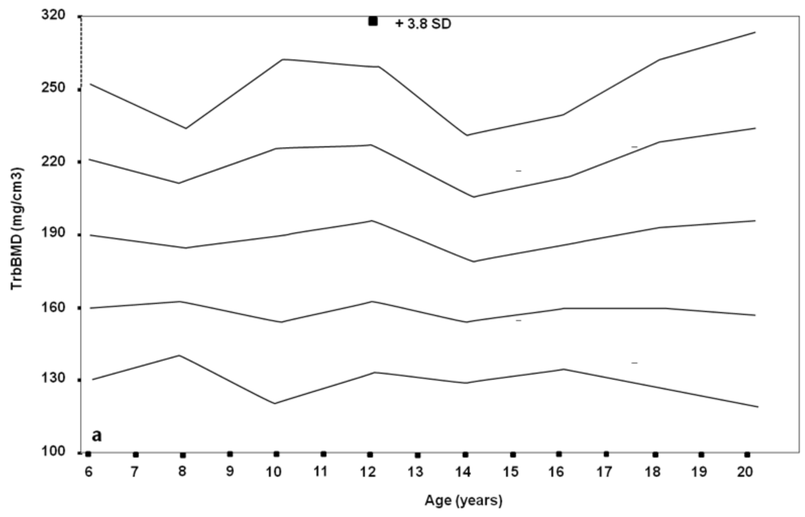
METHODS

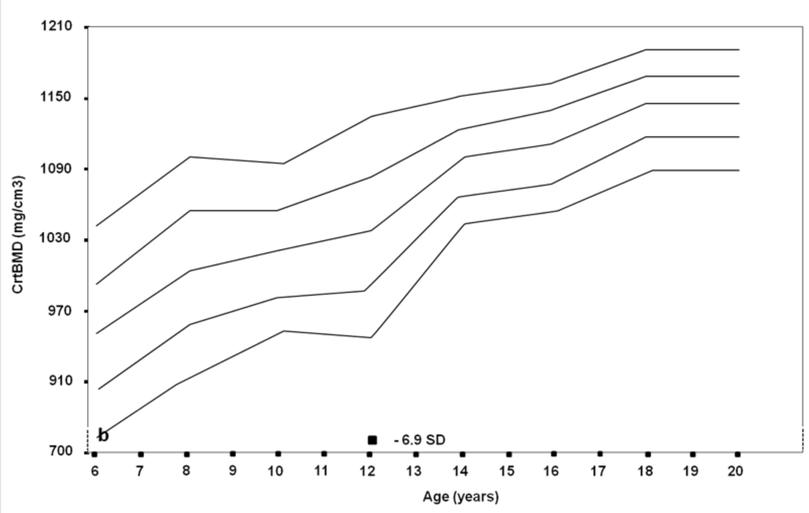
Genetic analysis, GH stimulation, rhGH treatment, CGH-array, dual-x-ray absorptiometry (DXA), peripheral quantitative computed tomography (pQCT), phalangeal bone sonography, bone metabolism study were carried out in this patient.

RESULTS

We report a patient referred to our centre at the age of 18 months for failure to thrive. GH stimulation tests revealed a GH deficiency (GH peak after arginine 8.92 ng/mL, after clonidine 6.92 ng/mL), whereas IGF-I was 248 ng/mL. rhGH treatment (0.23 mg/kg/week) showed only a slight improvement (from -5.1 to -3.5 SDS). Target height was 166.5 cm (0.67 SD). So, at 10 years of age, the child was re-evaluated: CGH-array identified a heterozygous *de novo* 4.92 Mb deletion in 15q26.2, including the *IGF1R* gene. DXA showed a normal BMD z-score (the BMD z-score corrected for height was 0.6), while pQCT revealed very reduced cortical (- 6.9 SDS) and increased trabecular density (3.8 SDS). The total density was normal (0.7 SDS), whereas we showed a significantly reduced bone area for muscle area (-4.0 SDS) and for height (-4.1 SDS). The SSI polar (-2.2 SDS) was significantly reduced. Fat area was also poorly represented (-1.8 SDS). Phalangeal bone sonography showed significantly reduced AD SoS and BTT values. Bone metabolism study revealed a reduced bone modelling and accrual with moderately high PTH and reduced osteocalcin, bone alkaline phosphatase and urinary deoxypyridinoline concentrations







CONCLUSIONS

Our study showed the presence of changes in bone architecture, quality, and metabolism in heterozygous *IGF1R* deletion patients, supporting IGF-I as key in bone modelling and accrual.

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