Bone Health Index: a potential discriminator between Growth Hormone Deficiency and Constitutional Delay in Growth and Puberty in adolescent children

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Background:

- Constitutional Delay in Growth and Puberty (CDGP), the most common cause of short stature in children, is a transient state of delayed growth, skeletal maturation and attenuated pubertal growth spurt.
- It is not always easy to differentiate CDGP from Growth Hormone Deficiency (GHD) even with robust clinical and auxological assessment, measurement of IGF1 and bone age evaluation
- Bone health index (BHI) is a quantitative measure of bone health calculated from a hand and wrist X ray using a software programme.

Objective and hypotheses:

- To examine whether measurement of BHI aids differentiation between GHD and CDGP during adolescence.

Methods:

- Retrospective data from 75 patients (43CDGP/32GHD) were analysed.
- GHD was diagnosed if GH peak was <6.7 mcg/L on 2 standard GH stimulation tests
- CDGP was diagnosed on clinical grounds and by exclusion of other pathologies causing growth and pubertal delay.
- Bone age (BA) and BHI estimation (Tanner-Whitehouse -2, 3) were performed by BoneXpert software.

Results:

- 43 children (6F, 13.9%), age 14.69± 1.29 years, had CDGP and 32 (2F, 6.3%), age 14.20 ±2.04 years GHD.
- Mean height SDS was -1.92±0.87 in the CDGP group and -2.41±0.71 for GHD group.
- BA was 12.85±1.41 in the CDGP group and 12.78±2.18 for GHD group.
- IGF-I SDS was significantly higher in patients with CDGP compared with GHD, -1.33±1.14 vs. -2.54±1.22, (p=0.008).
- BHI SDS was also significantly higher in patients with CDGP(0.84±0.99) versus (-1.59±0.96) in the GHD group. (p=0.007).

Conclusion:

- These novel data indicate that BHI, a simple measure obtained at the time of BA estimation, is significantly lower in children with GHD than in those with CDGP.
- This may be a helpful tool to aid in differentiating CDGP from GHD, which is important as the treatment of each disorder is markedly different.
- There may be potential to reduce the number of GH stimulation tests unnecessarily performed, in short adolescents.

Conflict Of interest: None Stated

Reference:

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Growth

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