

The accuracy of BIA to detect body composition changes in adolescents with severe GHD during transition

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Background

Male adolescents with severe growth hormone deficiency show both, loss of lean body mass (LBM) and gain of fat free mass (FFM) when off GH. We recently showed that determining gain of FFM and loss of LBM by dual-energy X-ray absorption (DXA) is helpful in the diagnosis of severe GHD during transition as these body composition changes are correlated to the GH-peak of the arginine-GHRH-re-test.

Aims and Objectives

We wanted to explore if the measurement of body composition by multi-frequency arm-to-leg bioelectrical impedance analysis (mf-BIA) can substitute DXA during transition.

Methods

In total 40 male adolescents with childhood-onset GDH (age 14.7-19.6 y; mean 16.5 ± 1.1 y) underwent an examination of their body composition at time 0 and +6 months after stop of GH-treatment. At +3 months an arginine-GHRH-test was performed. A GH-peak less than 16 ng/ml indicated severe GHD. LBM and FFM were measured by DXA and mf-BIA at the same day under fasting conditions. The body composition change score (BCC score) was calculated as the sum of gain of FFM and loss of LBM between time 0 and time +6 months.

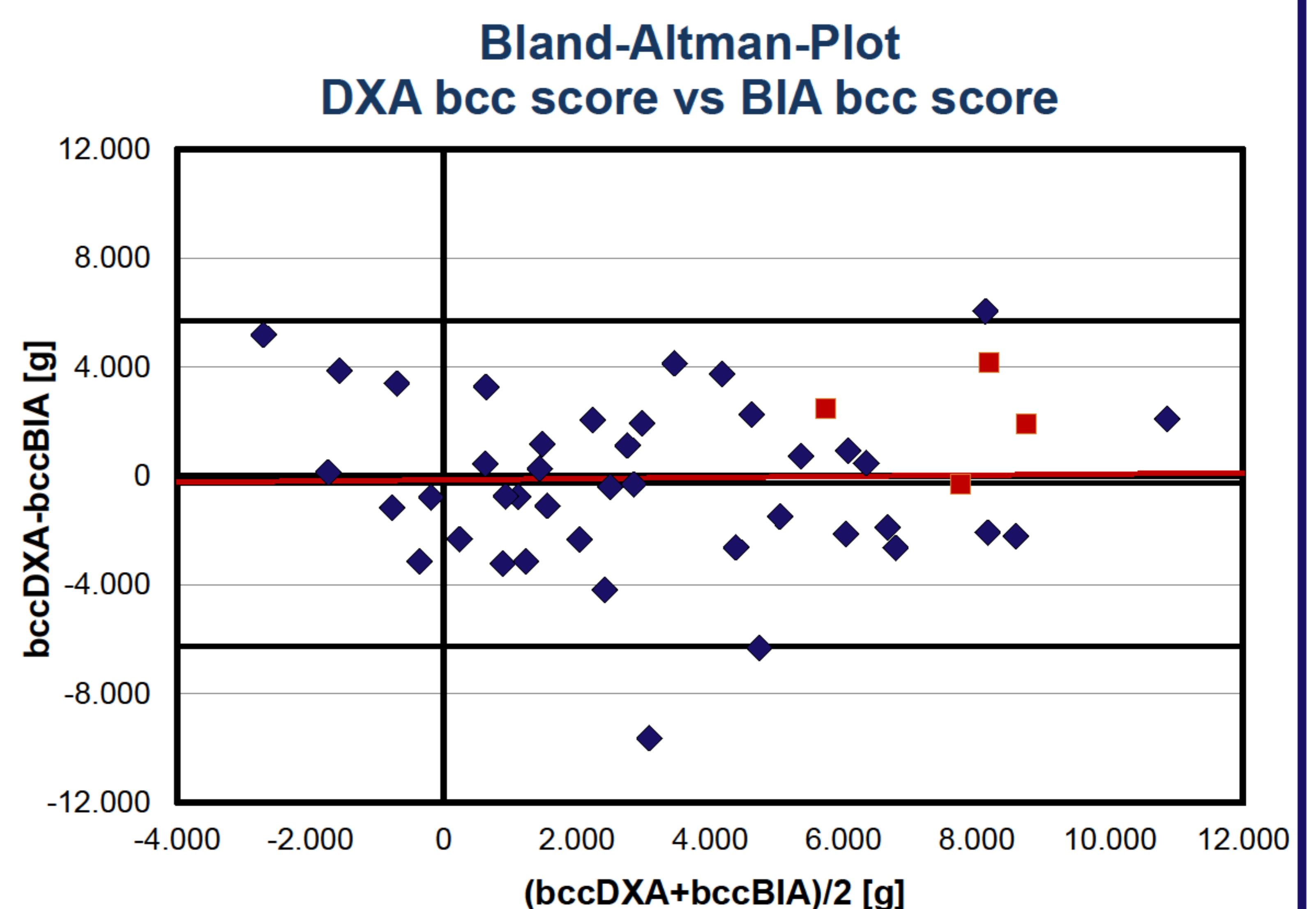
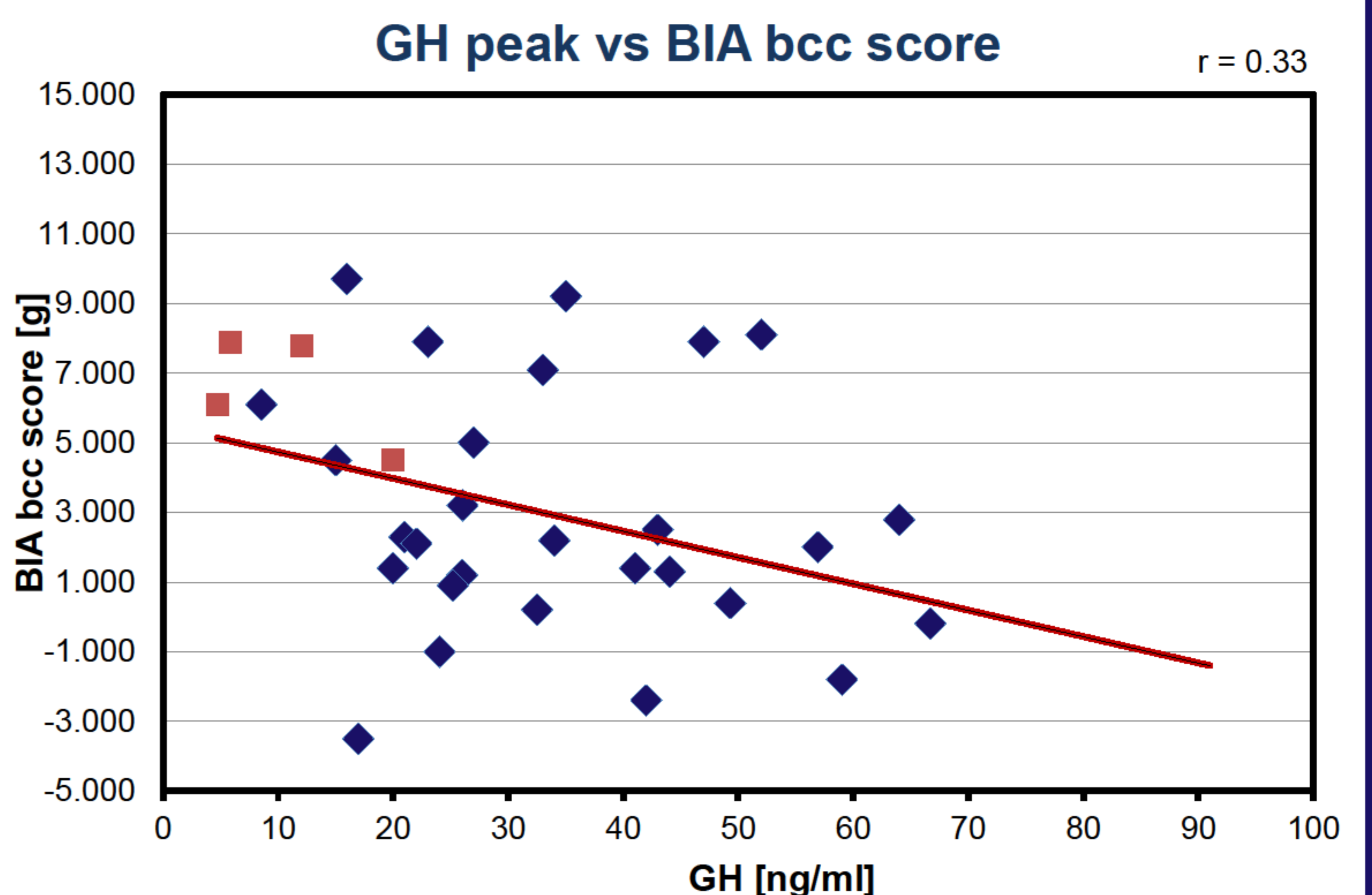
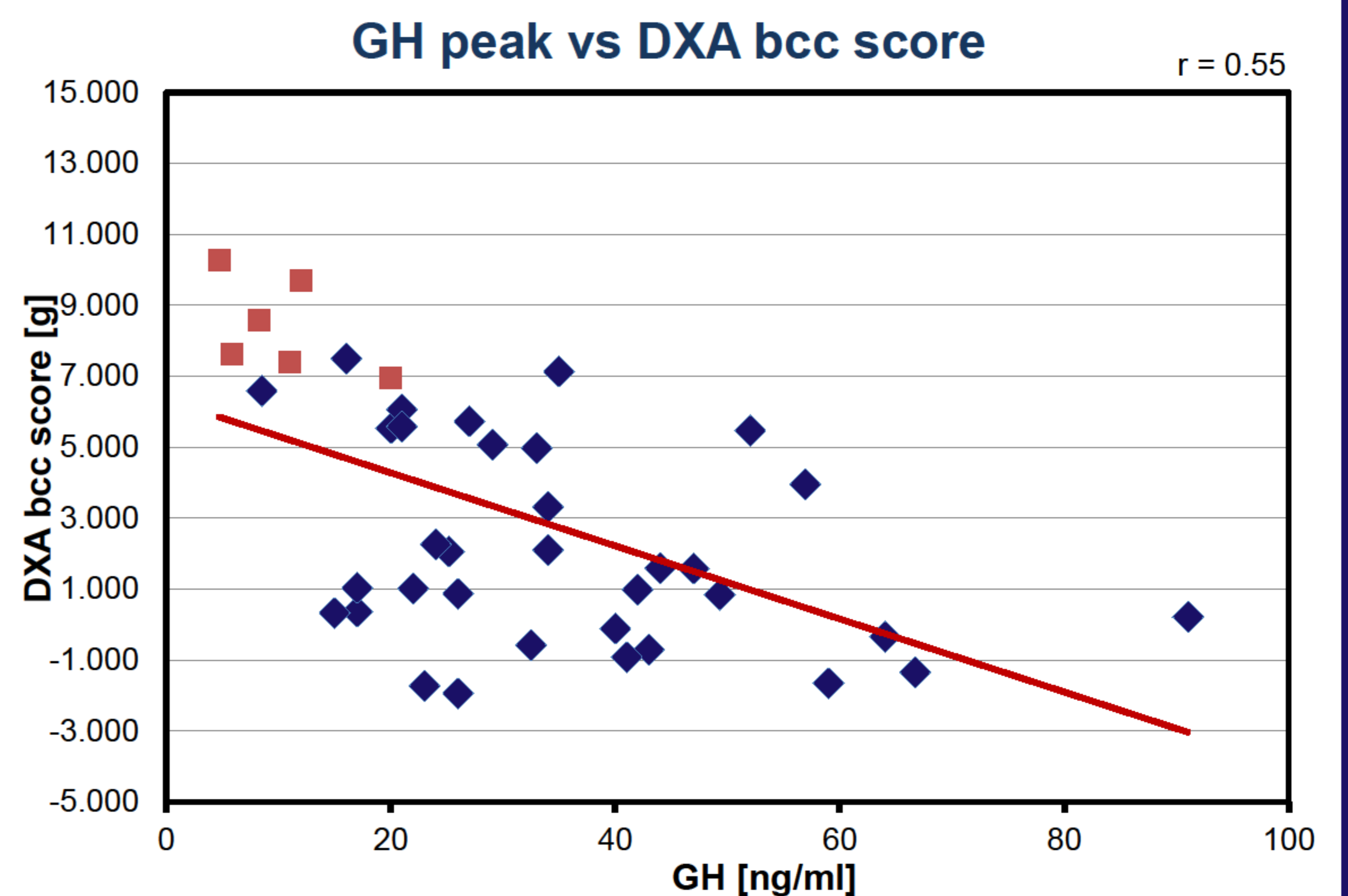
Results

BIA failed at 8 patients due to technical problems. Six patients were diagnosed with severe GHD. All had a BIA-BCC larger than 4.5 kg and a DXA-BCC larger than 7.0 kg. Using these BCC scores as cut-offs, false positive BCC scores were found in 8 of 28 patients (29%) using BIA and in 2 of 34 patients (6%) using DXA. The correlation of the GH-peak to BIA BCC score was lower ($r = 0.33$) than to DXA BCC score ($r = 0.55$).

Conclusion

BIA is comparably sensitive, but less specific than the gold-standard DXA in detecting body composition changes in male adolescents with severe GHD during transition.

Results



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Conflicts of Interest: The authors have nothing to declare

