GH response to GHRH/Arginine in previously GH-treated young adults with Prader-Willi syndrome

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Conclusion

None of the patients fulfilled the consensus criteria for adult GH deficiency

Background

Some of the features of subjects with Prader-Willi syndrome (PWS) resemble those seen in subjects with growth hormone deficiency (GHD). Children with PWS are treated with long-term growth hormone (GH), which has substantially changed their phenotype. Currently, young adults with PWS have to stop GH after attainment of adult height when they do not have adult GHD. Limited information is available on the prevalence of adult GHD in previously GH-treated patients with PWS.

Aim

To investigate GH peak during GHRH-arginine test and serum IGF-I and IGFBP-3 levels in a large group of young adults with PWS, who were GH-treated during childhood.

Participants & Methods

Cross-sectional study in 60 young adults with PWS. Main outcome measures were serum IGF-I and IGFBP-3 levels and GH peak during a combined GHRH-Arginine test. The influence of BMI, body composition and genetic subtype were assessed.

GHD was defined as a GH peak level < 9 µg/l together with a serum IGF-I < -2.0 SDS. BMI-related GH cut-off points: < 11.5 µg /l if BMI is < 25 kg/m^2, < 8.0 µg /l if BMI is 25-30 kg/m^2, and < 4.2 µg/l if BMI > 30 kg/m^2.

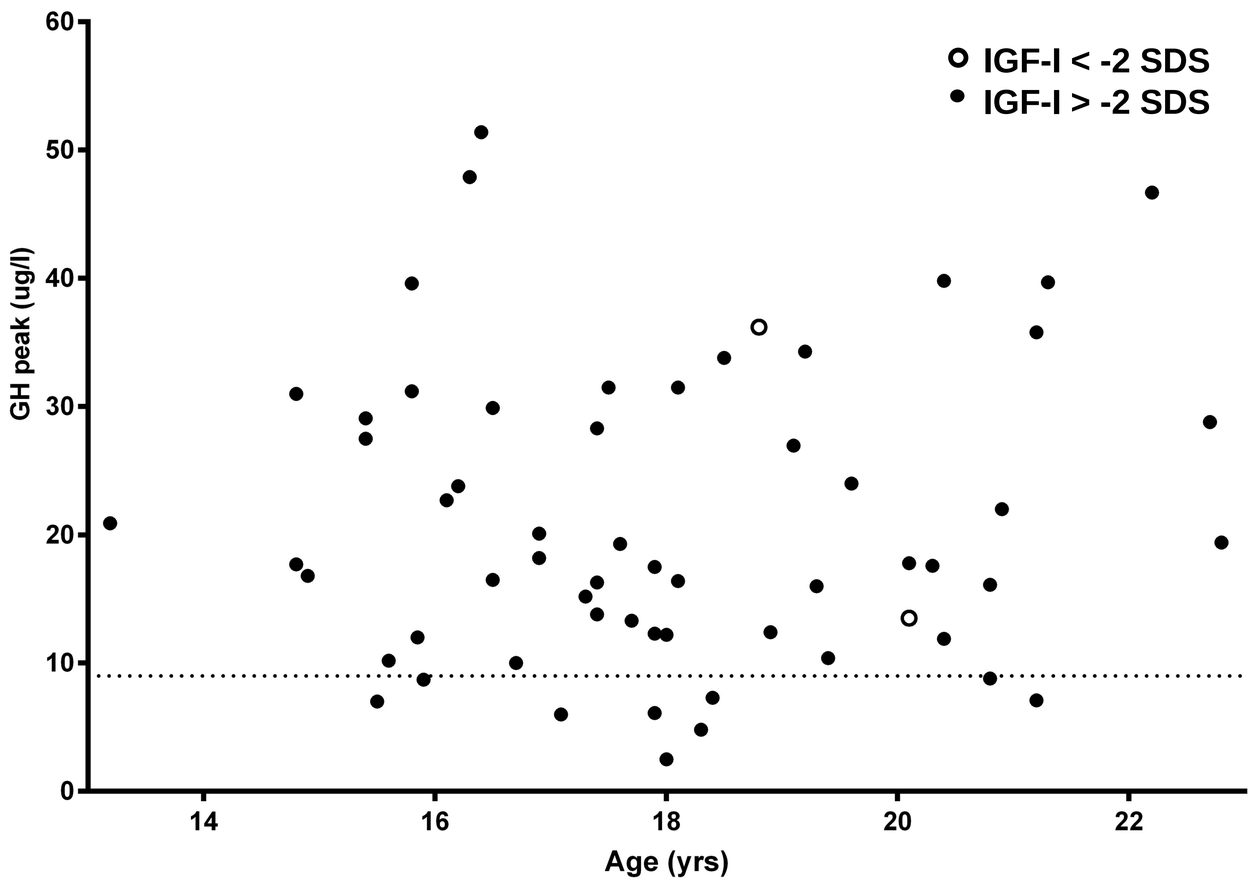
Results

Clinical characteristics		
Age (years)	17.9	(16.3; 19.6)
Gender (♂ / ♀)	27 / 33	
Genetic subtype - Deletion - mUPD - Translocation - unknown	 29 (48%) 25 (42%) 5 (8%) 1 (2%)	
Height SDS	-1.0	(-1.7; -0.3)
BMI	24.2	(21.2 ; 27.9)
BMI for age SDS	1.1	(-0.2; 1.9)
Fat mass percentage	40.5	(35.7; 47.5)
Fat mass percentage SDS	2.3	(1.8; 2.6)
Lean body mass SDS	-2.3	(-3.1; -1.2)

GH response to GHRH-arginine		
IGF-I SDS	-0.4	(-1.1; 0.4)
IGFBP-3 SDS	1.6	(1.0; 2.2)
GH peak (ug/l)	17.8	(12.2; 29.7)
Time to GH peak (min)	45.0	(30.0; 60.0)

Data expressed as median (IQR).

GH peak and IGF-I SDS in 60 young adults with PWS



- Serum IGF-I was < -2 SDS in 2 patients (3%) and IGFBP-3 was within the normal range in all but one participant. Median (IQR) GH peak was 17.8 µg/l (12.2 ; 29.7) and below 9 µg/l in 9 patients (15%).
- None of the patients fulfilled the diagnostic criteria for adult GHD, also when BMI-related criteria were used.
- Higher BMI and FM% were significantly associated with a lower GH peak. GH peak did not correlate with age or IGF-I.

Discussion

The prevalence of GH deficiency in PWS depends on the criteria and stimulation test used. The GHRH-Arginine test is considered to be a good test to evaluate the secretory capacity of somatotropic cells. Neither serum IGF-I levels nor GH peak on itself appeared to be reliable predictors of GH insufficiency in adults with PWS.

As studies have shown that GH treatment has positive effects on body composition and health profile in adults with PWS, there is a need for the registration of GH treatment for adults with PWS, regardless of the presence of adult GHD.

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