

Early-onset growth hormone treatment in Prader-Willi syndrome attenuates the risk of transition to severe obesity

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INTRODUCTION

Following a phase of feeding difficulties and underweight in early life, children with Prader-Willi syndrome (PWS) develop hyperphagia and a tendency towards severe obesity. Growth hormone therapy (GH) has been approved in PWS to compensate their growth failure but may exert also additional effects on muscle component and body composition as well.

AIM

We aimed to test if an early initiation of GH therapy within the first two years of life may positively influence the trajectory of body mass index (BMI) in PWS, if compared to PWS children with later therapy onset.

METHOD

We analyzed individual trajectories of BMI in 98 patients with PWS from the REPAR – Czech national registry of patients treated with GH (54 boys and 44 girls; mean age at start of treatment 5.5 ± 4.3 years; mean \pm SD). Patients were divided into two groups according to age at the start of GH treatment:

- early-onset GH therapy – treatment started till 2 years of age (n = 55; age 0.8 ± 0.4 years; mean \pm SD)
- late-onset GH therapy – treatment started thereafter (n = 43; age 7.0 ± 4.6 years; mean \pm SD).

RESULTS

Children within the late-onset GH therapy group were obese already at treatment initiation (SDS BMI 2.9 ± 2.1 ; mean \pm SD) – Tab.1. Within the first year of GH treatment, their BMI significantly declined by 0.9 SDS (p = 0.009). After five years, mean BMI decreased below the obesity limit to $1.7 (\pm 1.8)$ SDS. On the opposite, children with early-onset GH therapy were underweight before GH treatment (mean SDS BMI -1.0 ± 1.2) – Tab.1. Between 3rd and 7th year of treatment, their BMI significantly increased to borderline obesity range (2.1 ± 2.6 SDS; p < 0.001). After 5 years of therapy, BMI-SDS did not differ between both groups (p = 0.45) – Fig.1. However, most children with an early-onset GH therapy apparently avoided the phase of severe obesity.

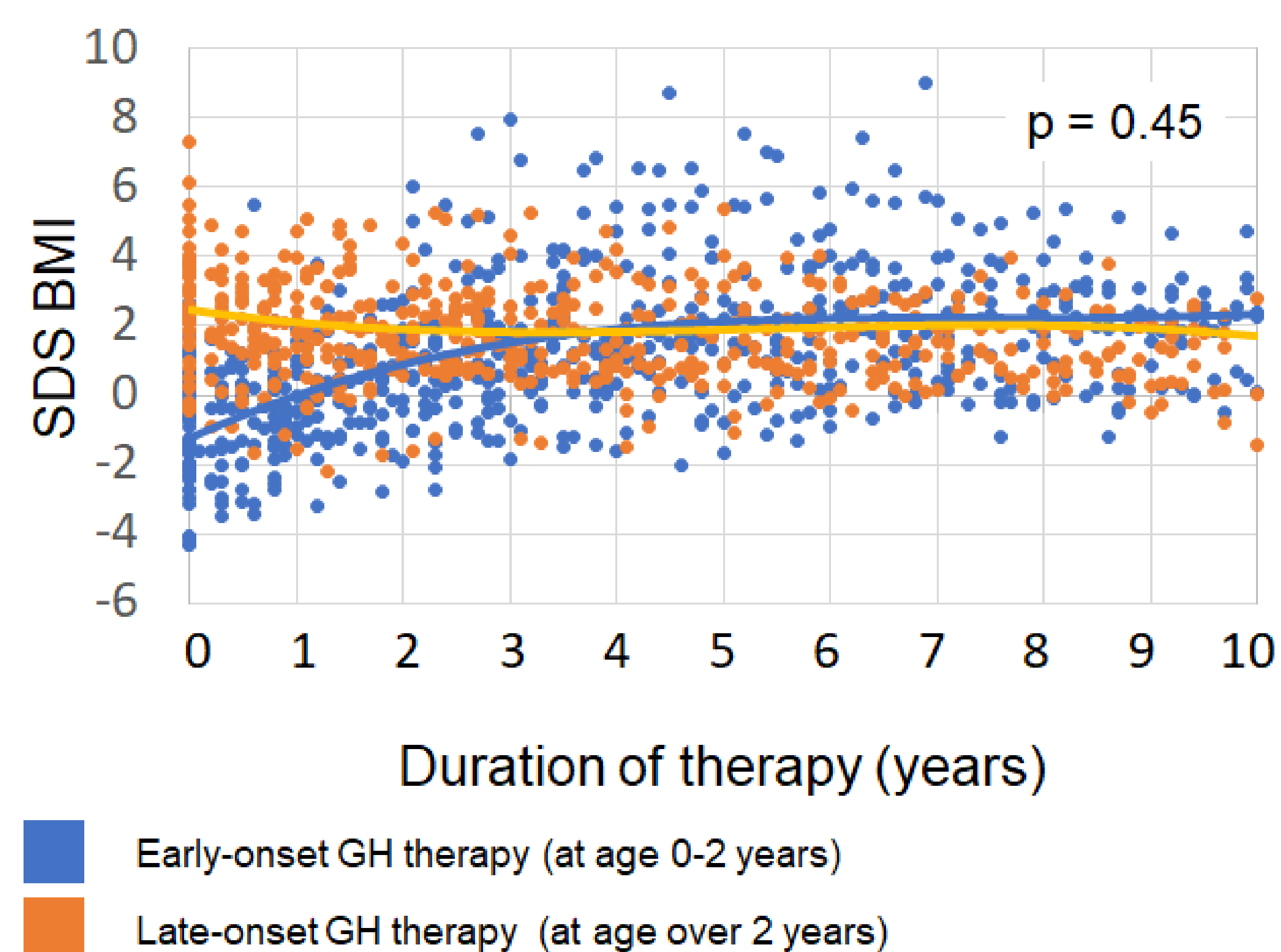


Figure 1: Comparison of SDS BMI during therapy - After 4 years from the start of treatment, the difference in SDS BMI between the individual groups (early- and late-onset) is statistically insignificant.

Table 1: SDS BMI late- and early-onset GH therapy according to the duration of therapy. Statistically significant difference at treatment initiation (p-value): ** < 0.01. A nonparametric Wilcoxon sign test with Bonferroni correction was used for statistical assessment.

Duration of therapy	SDS BMI – late on-set GH therapy			SDS BMI – early on-set GH therapy		
	Years	N	Mean (SD)	Median (Min; Max)	N	Mean (SD)
0	43	2.85 (2.11)	2.76 (-0.63; 8.66)	55	-0.97 (1.16)	-0.82 (-3.91; 1.80)
1	35	1.81 (1.63)**	1.87 (-1.40; 5.06)	42	-0.49 (1.39)	-0.71 (-2.89; 3.84)
3	34	2.09 (1.81)	1.62 (-1.26; 5.99)	38	1.39 (2.14)**	1.07 (-1.97; 9.53)
5	24	1.70 (1.78)	1.14 (-1.22; 5.41)	32	2.12 (2.63)**	1.58 (-1.61; 11.1)
7	21	1.53 (1.40)	1.03 (-0.27; 4.12)	25	2.04 (2.29)**	1.41 (-0.98; 8.01)
10	12	1.41 (1.51)	1.38 (-1.57; 3.73)	11	1.40 (1.22)	2.11 (-0.63; 2.49)

CONCLUSIONS

Early initiation of GH administration in children with PWS has the potential to prevent transition to severe obesity within their entire childhood, at least in 60 % of children. Following five years of GH therapy, no differences persist in BMI between those who were treated early or late. Nevertheless, the long-term effective prevention of obesity in PWS unavoidably also requires adjustment of eating habits.

DEPARTMENTS

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ACKNOWLEDGEMENTS

Data collection and analysis in cooperation with growth hormone treatment centers and IBA, s.r.o.

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