

Eight years of GH treatment in children with PWS: The earlier the start, the better the outcomes?

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Background

Growth hormone (GH) is an approved treatment for children with Prader-Willi Syndrome (PWS). Studies comparing the long-term effects of GH in children with PWS with untreated controls are lacking. Over the years, the age at start of GH treatment has become younger. Studies evaluating the long-term effects and safety of starting GH in the first year of life are very limited

Aim

To investigate the effects of 8 years of GH on body composition, anthropometrics and cognition in children with PWS, compared to untreated controls and to assess whether it is optimal and safe to start GH in the first year of life.

Participants & Method

Prospective study in 82 children with PWS who started GH before age 5 years. All patients received GH at a dose of 1 mg/m²/d (≈ 0.035 mg/kg/d).

Main outcome measures were body composition, anthropometric measurements and cognitive functioning. After 8 years of GH, the outcomes were compared with a group of 22 children with PWS who did not receive GH. In addition, we divided the group into tertiles based on age at GH start (group A: age < 1 yr; group C: 2-5 yrs) and compared outcomes between A and C and their trajectories during 8 years of GH treatment.

Conclusion: Long-term GH treatment has positive effects on body composition and growth in children with PWS and our findings suggest that starting GH in the first year of life is most optimal and safe.

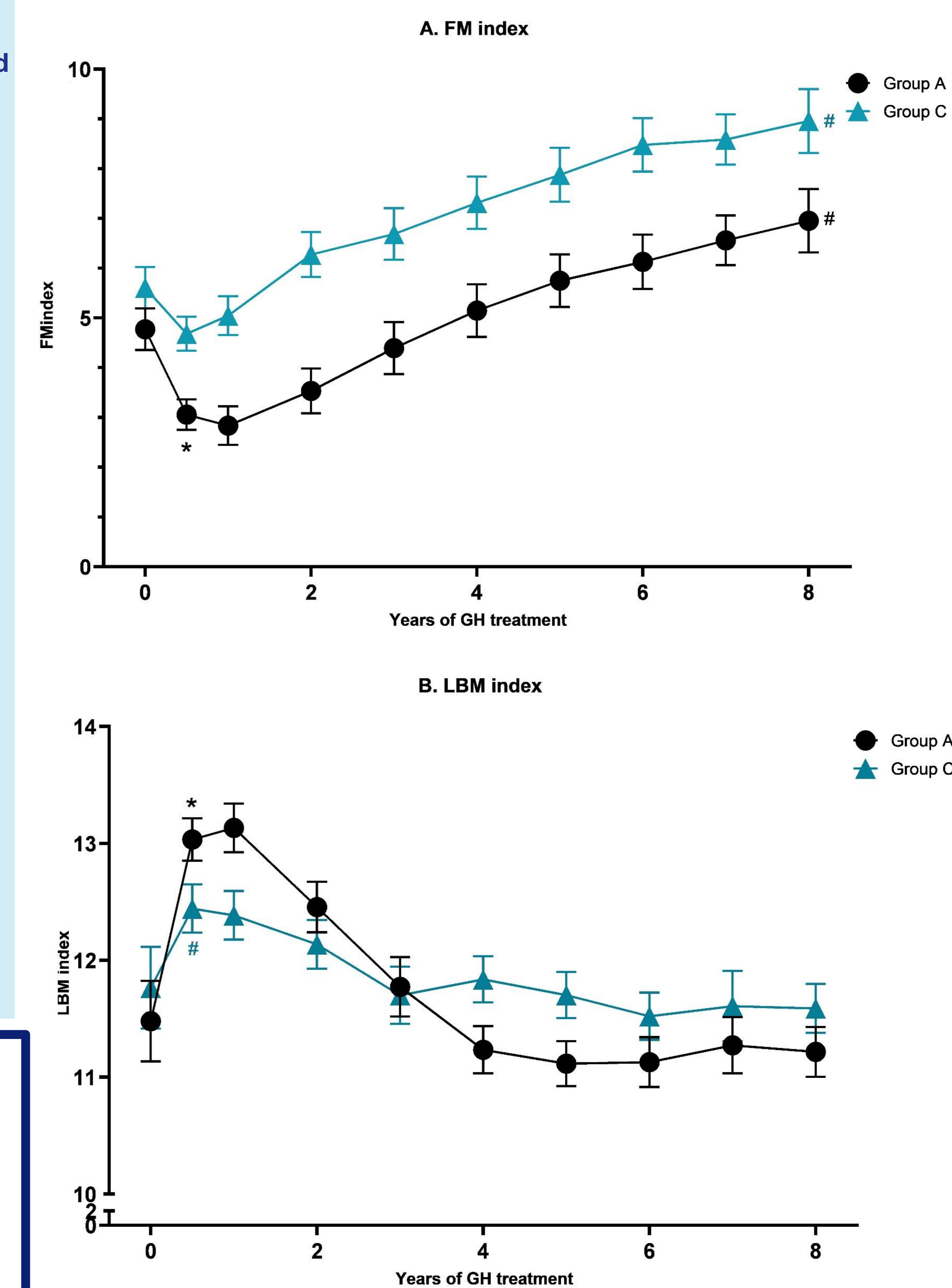
Results after 8 years of GH compared to untreated controls

	GH-treated N=82	GH-untreated N=22	Group A N=27	Group C N=27
Age (years)	9.88 (1.19)	10.35 (1.37)	8.75 (0.19)	11.33 (0.80)^d
Early stage of Puberty (N, %)	27 (32.9)	3 (18.2)	4 (14.8)	15 (55.6)^c
Fat mass % SDS ^a	1.90 (0.07)	2.25 (0.15)^c	1.81 (0.54)	2.06 (0.87)
Fat mass percentage ^b	38.7 (0.92)	43.7 (1.76)^c	36.0 (1.70)	40.7 (1.78)
Fat mass index (FMI) ^b	8.0 (0.4)	10.2 (0.7)^c	7.0 (0.65)	9.0 (0.68)
Trunk/peripheral fat ratio ^b	0.83 (0.01)	0.87 (0.02)	0.80 (0.02)	0.87 (0.02)^c
Lean body mass SDS ^a	-1.51 (0.10)	-1.92 (0.20)^c	-1.49 (0.68)	-1.33 (1.15)
Lean body mass index (LBMI) ^b	11.3 (0.1)	11.8 (0.2)	11.2 (0.22)	11.5 (0.23)
Height SDS	0.29 (1.19)	-2.01 (1.49)^d	-0.08 (0.86)	0.32 (1.34)
Head circumference SDS	0.60 (1.09)	-0.59 (0.75)^d	0.66 (0.89)	0.53 (1.29)
Weight for height SDS	1.09 (1.16)	2.19 (0.95)^d	0.90 (1.26)	1.36 (1.17)
BMI SDS	1.10 (1.50)	1.63 (1.01)	0.80 (1.09)	1.40 (1.26)
Cognitive functioning (SS)				
Block design	4.29 (3.18)	3.19 (2.66)	5.29 (2.93)	3.58 (3.27)
Vocabulary	4.94 (2.82)	4.81 (2.07)	6.71 (2.56)	3.63 (2.54)^c
Similarities	6.16 (2.78)	5.06 (2.93)	7.29 (2.36)	5.26 (3.26)
Estimated total IQ	70.4 (14.1)	67.3 (10.1)	78.1 (12.6)	64.8 (14.5)^c

Data expressed as mean (SD). FMI = fat mass/height²; LBMI = LBM/height²; ^acorrected for height, expressed as Estimated Marginal Mean (SE) ^bcorrected for puberty and sex, expressed as Estimated Marginal Mean (SE); ^cp<0.05 ^dp<0.001

- After 8 years, children treated with GH had a significantly better body composition, a taller stature and larger head circumference compared to untreated controls.
- Trajectories of FMI and LBMI were significantly different between group A and C, with a more prominent response after GH start in group A, resulting in a better body composition during the first years after GH start.
- Children who started GH in the first year of life had a more beneficial trunk/fat ratio and a higher Total IQ score after 8 years of GH.
- No adverse effects of starting GH in the first year of life were found.

Trajectories of FMI and LBMI



*p-value < 0.001, # p-value < 0.01, ** p-value < 0.05. p-values are compared to baseline

