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Background

- There is limited data regarding pubertal characteristics of children with classical 21-hydroxylase deficiency (21OHD)
- The aim of this study was to explore the timing and tempo of puberty, and pubertal height gain (PHG) in children with 21OHD

Method

- A multicenter, observational, retrospective, longitudinal analysis
- Data from 283 patients (876 visit measurements) with classical 21OHD (195 salt-wasting (SW) and 88 simple virilising (SV)) were analysed.
- Ages of attainment of Tanner stages, bone maturation, height gain, final height (FH), midparental height (MPH) were collected.
- Puberty modifying therapies (PMTs) such as gonadotropin releasing hormone analog (GnRHa), aromatase inhibitors (AI) and cyproterone acetate (CPA) were recorded

Results

- 152 of 283 patients were pubertal/postpubertal (85F, 67M).
- PMTs (GnRHa, AI and CPA) had been used in 18.2, 1.3 and 7.0% in females and, 27.4, 10.5 and 10.5% in males, respectively.

In girls,

- Median age of breast stage 2 (B2) was 8.9 years (IQR:7.8-10.0)
- In those, who did not receive PMT, MAA of B3 through B5 were; B3: 11.1 year, B4: 12.4 years, B5: 14.2 years
- Median age of menarche was 13.2 years.
- Median age of pubic hair stage 2 (P2) was 8.4 years.
- In girls with longitudinal data from B2 to final height and no PMTs; duration from B2 to menarche was 3.4 years, B2 to B5 was 3.6 years,
- Height gain from B2 to menarche 13.9 cm
- Height gain from B2 to final height 17.5cm
- In girls who received PMTs, these figures were 5.5 years, 6.4 years, 21.7 cm and 24.1 cm, respectively.

In boys,

- Median ages of G2 through G5 were 8.8, 12.7, 13.7, and 15.1 years
- Median age of P2 was 8.2 years.
- In boys with longitudinal data from G2 to final height and no PMTs, median duration from G2 to G5 was 4.1 years,
- Height gain from G2 to G5 21 cm
- Height gain from G2 to final height 28.1 cm
- In boys who received PMTs, these figures were 7.5 years, 29.1 and 32.9 cm, respectively.

Table 1. Pubertal growth characteristics of the patients with classical 21OHD

		46, XX median (IQR)	46, XY median (IQR)
Tanner II to III	Interval (yrs)	1.2 (0.8-2.1)	2.0 (1.5-2.8)
	Height gain (cm)	7.5 (3.7-11.2)	11.4 (9.7-17.4)
	GV (cm/yr)	5.5 (3.8-6.6)	5.5 (4.9-7.0)
Tanner III to IV	Interval (yrs)	0.9 (0.4-1.7)	0.9 (0.7-1.1)
	Height gain (cm)	3.9 (2.3-6.1)	4.6 (3.3-7.6)
	GV (cm/yr)	3.5 (2.5-6.6)	5.2 (4.1-6.9)
Tanner IV to V	Interval (yrs)	1.2 (1.0-2.1)	1.3 (0.5-1.5)
	Height gain (cm)	3.7 (3.1-7.0)	3.3 (2.2-8.1)
	GV (cm/yr)	3.0 (2.1-5.7)	3.3 (2.1-5.8)
Total pubertal height gain (cm)		17.5 (16.2-23.9)	28.1 (19.9-32.2)
Pubertal duration from Tanner II to V (yrs)		3.8 (2.9-4.5)	4.1 (3.3-5.6)
Final Height (cm)		154.0 (147.3-158.2)	167.0 (160.0-170.0)
Final Height (SDS)		-1.5 [(-2.7)-(-0.8)]	-1.5 [(-2.5)-(-0.9)]
MPH SDS		-1.1 [(-1.8)-(-0.5)]	-1.1 [(-1.6)-(-0.2)]
Final height – MPH (cm)		-2.5 [(-7.1)-(-1.8)]	-3.9 [(-8.4)-(-4.1)]

GV: growth velocity, MPH: midparental height

- PHG was similar between SW and SV groups. PHG was related inversely to height at pubertal onset (p=0.03) and positively to duration of puberty (p<0.05).
- Peak growth velocity observed between Tanner II to III in both sexes.
- Median FH was comparable to height predicted at Tanner II in both sexes.

Conclusion

- ✓ While mean age at onset of puberty is earlier, the tempo of puberty is slower and duration of puberty is prolonged leading to preserved pubertal height gain in patients with classical 21OHD.