Mean of Different Variables at Baseline and During Growth Hormone Therapy

Variable	Baseline n = 38	At 6 Months GH Therapy n = 37	At 1 Year GH Therapy n = 33	At 2 Year GH Therapy n = 33
Lumbar spine BMD SDS	−1.62	−1.33[a]	−0.98[a]	−0.64[a]
Lumbar spine BMAD SDS	−0.51	−0.50	−0.37	−0.19[a]
Total body BMD SDS	−0.94	−1.35[b]	−1.02	−0.61[b]
Bone mineral content SDS	−2.29	−2.36	−1.52[a]	−1.24[a]
Lean tissue mass SDS	−2.72	−1.86[a]	−1.53[a]	−1.14[a]
Fat mass SDS	−0.02	−0.59[c]	−0.31[c]	−0.59
% Body fat SDS	0.93	−0.39[a]	−0.10[a]	−0.45[c]
Height SDS	−2.98	−2.32[a]	1.86[a]	−1.63[a]
Body mass index SDS	0.45	0.24	0.39	0.37

[a] $P < 0.001$; [b] $P < 0.02$; [c] $P < 0.01$ compared to baseline.

BMAD, bone mineral apparent density
BMD, bone mineral density
SDS, standard deviation score

From Boot A, et al. Changes in bone mineral density, body composition, and lipid metabolism during growth hormone (GH) treatment in children with GH deficiency. *J Clin Endocrinol Metab* 1997;82:2425. ©The Endocrine Society.

showed evidence of the anabolic effect of GH, as demonstrated by the increase in BMD, the increase in lean body mass, and the decrease in body weight. Some of these metabolic effects may be considered direct effects of GH replacement. An increase in the serum 1,25 dihydroxyvitamin D level has been reported during GH treatment due to renal inactivation induced by insulin-like growth factor 1, an indirect effect resulting in the beneficial increase in BMD.

The authors concluded that treatment had a beneficial effect on lipid metabolism. However, there were no significant changes found in lipid metabolism as baseline values were all normal. In my opinion, no conclusions can be drawn from the present study regarding the beneficial effects on lipid metabolism. Long-term studies in children need to be done since adults with GHD are at risk of hypercholesterolemia and coronary heart disease.

Fima Lifshitz, MD

Growth Hormone Therapy in Prepubertal Children With Noonan Syndrome: First Year Growth Response and Comparison With Turner Syndrome

The authors report that during the first year of administration of recombinant human growth hormone (rhGH; 0.15 U/kg/d given by daily injection) to 23 prepubertal subjects with Noonan syndrome (9.4 ± 3.0 years), the increase in height velocity was 8.5 cm, approximately twice the pretreatment growth rate. In a group of females with Turner syndrome of similar age at initiation of rhGH, the mean height increment was 8.1 cm during the first year of treatment. Four of 23 Noonan syndrome subjects had no significant change in height standard deviation scores (SDS) during rhGH administration. In Noonan patients, the increment in height velocity during rhGH administration was directly related to birth weight, suggesting that low-birth-weight children with Noonan syndrome responded less well to treatment. The changes in bone age, growth velocity, and height SDS were similar in Turner and Noonan syndrome groups. The authors conclude that the linear growth response to short-term administration of rhGH is comparable in patients with Noonan and Turner syndrome.

De Schepper J, et al. *Acta Paediatr* 1997;68:943-946.

Editor's comment: *Although phenotypically similar, patients with Noonan syndrome have growth patterns distinct from those of patients with Turner syndrome. The mean adult height of male patients with Noonan syndrome is 162.5 cm, and the mean adult height of female patients is 152.7 cm; the latter is almost 10 cm greater than the mean adult height of untreated subjects with Turner syndrome.[1] Romano et al[2] reported that 3/6 males with Noonan syndrome treated with rhGH achieved final heights greater than predicted, but specific data were not provided. In view of the minimal positive effect of rhGH on final height of normal short children,[3] assessment of the role of rhGH treatment in children with Noonan syndrome must be deferred until adult height data are available. Incidentally, the spontaneous growth pattern of Northern European patients with Turner syndrome recently has been reported.[4] The mean adult height of these subjects was 146.9 cm, approximately 4 cm greater than that reported by other investigators, underscoring once more the importance of ethnic as well as familial genetic factors on growth.*

Allen W. Root, MD

1. Ranke MB, et al. *Eur J Paediatr* 1988;148:220-227.
2. Romano AA, et al. *J Pediatr* 1996;128:S18-S21.
3. Schmitt K, et al. *Eur J Pediatr* 1997;156:680-683.
4. Rongen-Westerlaken C, et al. *Acta Paediatr* 1997;86:937-942.

The Duration of Puberty in Girls Is Related to the Timing of Its Onset

The authors serially took the history of and examined 163 normal girls from age 10 to 15 years, determining the ages at which thelarche developed and menarche occurred. The mean age at menarche was 12.62 years (see Table). The younger the age at thelarche the more prolonged was the interval between thelarche and menarche. There was an inverse relationship between age at thelarche and interval to menarche.

Marti-Henneberg C, et al. *J Pediatr* 1997;131:618-621.

Editor's comment: *The investigators defined menarche not as the first episode of vaginal bleeding, but as the first menses that was followed by "regular cycles." While this definition is different than the usual one used in the United States, the data are of interest because they address the issue of the tempo of pubertal development and suggest that the later its onset, the more rapid is the progression of sexual maturation. The manuscript utilizes the term "duration of puberty" as the interval between thelarche and menarche. This is misleading as the duration of puberty extends well past this point.*

Allen W. Root, MD

Age at Menarche and the Duration of Puberty in the Overall Study Sample and the Subgroups Assigned by Age-of-Onset of Puberty

	Menarche Age		Duration of Puberty	
Study Subjects	Mean ± SEM	Range (y)	Mean ± SEM	Range (y)
Total (n = 163)	12.62 ± 0.06	10.25 - 14.41	1.96 ± 0.06	0.25 - 4.25
9 y (n = 22)	11.77 ± 0.15*	10.25 - 12.91	2.77 ± 0.15*	1.25 - 4.25
10 y (n = 53)	12.27 ± 0.10	11.00 - 13.91	2.27 ± 0.10	1.00 - 3.91
11 y (n = 54)	12.77 ± 0.07	11.59 - 14.25	1.78 ± 0.07	0.59 - 3.25
12 y (n = 27)	13.44 ± 0.10	12.42 - 14.41	1.44 ± 0.10	0.42 - 2.41
13 y (n = 7)	13.65 ± 0.09	13.25 - 13.92	0.65 ± 0.09	0.25 - 0.92

Menarche is defined as "regular cycles." Duration of puberty is defined as the period between thelarche and regular cycles.
Correlation (age at onset versus age at menarche) $r = 0.66$; $P<0.001$
Correlation (age at onset versus duration of puberty) $r = 0.62$; $P<0.001$
* Stepwise analysis of variance $P<0.001$ between groups
From Marti-Henneberg C, et al. The duration of puberty in girls is related to the timing of its onset. *J Pediatr* 1997;131:618–621.