

## Effects of Different Oestrogen Doses on Final Height Reduction in Girls with Constitutional Tall Stature

Gruters et al have studied the effects of two different dosages of ethinylestradiol (EE) on final height reduction in German girls whose final height prediction exceeded 3 SD (>180 cm) above the mean. Group 1 (38 girls) at the University Children's Hospital in Gottingen received a daily dose of 0.3 to 0.5 mg EE, while 44 girls (group 2) at the University Children's Hospital in West Berlin received 0.1 mg EE daily. Both treatment protocols utilized daily estrogen administration in conjunction with 10 mg medroxyprogesterone acetate for 5 to 7 days every 4 weeks to induce cyclic bleeding. Subjects were examined every 3 months and bone age (BA) was determined by the Greulich and Pyle method every 6 months.

Treatment was discontinued at BA-15 years in group 1 and after two successive BA determinations  $\geq 15$  years in group 2. Final height was measured in all girls  $\geq 18$  years (mean, 20.2 years). Standing height was measured with a calibrated stadiometer and predicted height was estimated according to Bayley and Pinneau tables.

At the onset of treatment there were no differences in chronologic age, BA, height, growth velocity, or height prediction between the two groups. Growth velocity was significantly reduced by estrogen in both groups.

Although duration of treatment was longer in group 2, the cumulative estrogen dose was lower in group 2 than in group 1. From the predicted final height the mean reduction was  $4.9 \pm 2.6$  cm in group 1 and  $5.1 \pm 2.4$  cm in group 2. Final height was reduced more in each group when the treatment was started at BA <13 years. No

side effects were observed in either group.

Gruters A, Heiderman P, Schludter H, Stubbe P, Webber B, Helge H: *Eur J Ped* 1989;149:11-13.

**Editor's comment**—This article reports that in a large sample of tall girls, different doses of EE had similar effects on final height reduction. Thus, as the authors point

out, it would seem prudent to utilize the lowest possible dose of estrogen in an attempt to minimize possible side effects—such as thromboembolism, hypertension, and increased body weight—that are known to be dose dependent. A prospective randomized clinical trial to determine the lowest effective dose is needed.

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## Effects of Oestrogen Treatment on the Proportionality of Growth in Tall Girls

Hermanussen et al studied the effects of estrogen therapy (conjugated estrogen, 7.5 mg/d, plus cyclic gestagens) on standing height and lower leg length in 17 girls with tall stature and compared those results to a control group of 17 healthy untreated tall girls. The heights of all girls exceeded 2 SD for age, or their predicted adult height exceeded 182 cm. All were measured weekly or monthly using a Harpenden stadiometer. Knemometry, a noninvasive technique, was used to measure the lower leg length in the sitting position. Growth rates were calculated using linear regression analysis.

Estrogen treatment led to a significant reduction of lower leg length increment in the treated girls. Standing height velocity dropped from 150 to 122  $\mu\text{m}/\text{d}$  in the estrogen-treated girls. The decrease in standing height velocity was explained by a marked inhibition of lower leg growth velocity, from 42 to 30  $\mu\text{m}/\text{d}$ . No differences in trunk growth velocity were detectable. According to the authors, these findings suggest that pharmacologic doses of estrogen act locally at the level of epiphyseal growth and, therefore, girls who have passed mid-puberty—when most peripheral growth has been completed—would not be expected to benefit significantly from high estrogen treatment.

Hermanussen M, Geiger-Benoit K,

Burmeister J. *Euro J Ped* 1989;149:14-17.

**Editor's comment**—This interesting paper suggests that treatment for excessively tall stature in healthy girls should be initiated prior to mid-puberty if maximal benefit is to be attained. In addition, the finding that high-dose estrogen works primarily at epiphyseal growth centers leads to speculation about the use of estrogen therapy in agonadal girls. It would be of interest to evaluate the effect of low-dose estrogen on lower limb length and growth velocity in normal girls and in girls with Turner syndrome, particularly because others have suggested that sex steroids play no role in the growth rate of agonadal children prior to puberty. Similarly, the effects of low- and high-dose testosterone therapy in agonadal and constitutionally delayed-growth boys should also be pursued (with knemometry).

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