

compared with Hispanic and non-Hispanic white female counterparts. Race played an important role independent of BMI.

Vitamin D deficiency was linked to metabolic syndrome by Jose Botella-Carretero et al. They demonstrated that 60% of such patients had low serum 25-hydroxyvitamin D concentrations which may contribute to insulin resistance.

### Pubertal Gynecomastia

Two ingredients common in many hair and skin products were linked to abnormal development of breasts in males with pubertal gynecomastia. Derek Henley et al showed that lavender and tea tree oil contained in

personal care products turned on estrogen-regulated genes and inhibited an androgen-regulated gene in human breast cancer line MCF-7. Patients' breast size decreased after they stopped using these products.

### Thyroid

Mario Salvi et al showed the immunosuppressive drug rituximab was shown to exert a significant positive effect in the treatment of Graves' ophthalmopathy. The monoclonal antibody rituximab blocked the production of B lymphocytes, particularly from the orbital area, thereby modifying the immune response and improving the ophthalmopathy.

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## Aromatase Inhibitor Effect on Near-final Height of Boys with Constitutional Delay of Puberty

Hero et al reported near-final height of boys with constitutional delay of puberty (CDP) treated during adolescence with the aromatase inhibitor, letrozole (Lz). Seventeen boys with CDP were randomized to receive testosterone (T) enanthate 1 mg/kg intramuscularly every 4 weeks for 6 months in combination with placebo (PI; n = 8), or letrozole 2.5 mg/day orally (n = 9) for 12 months. Patients were followed to final height. Boys treated with T + Lz reached a higher mean near-final height than boys treated with T + PI (175.8 vs 169.1 cm, respectively,  $P = 0.04$ ). Near-final heights of subjects treated with T + Lz did not differ from their mid-parental target height (175.8 vs 177.1 cm, respectively,  $P = 0.38$ ), while near-final heights of T + PI-treated boys were lower than their mid-parental target height (169.1 vs 173.9 cm, respectively,  $P = 0.007$ ). Patients treated with T + Lz had a greater increment in height SDS than did T + PI-treated boys (+1.4 vs +0.8 SDS, respectively,  $P < 0.03$ ). The authors concluded that an increase in adult height can be achieved by the use of aromatase inhibitors in adolescent boys with CDP.

Hero M, Wickman S, Dunkel L. Treatment with the aromatase inhibitor letrozole during adolescence increases near-final height in boys with constitutional delay of puberty. *Clin Endocrinol*. 2006;64:510–513.

**Editor's Comment:** Estrogens have been found to be important for bone maturation, growth plate fusion, and cessation of longitudinal growth in both boys and girls. By blocking estrogen biosynthesis in boys with the use of aromatase inhibitors, one could possibly delay bone maturation and improve their final height. Two studies<sup>1,2</sup> have demonstrated an improvement in predicted adult height of 5.1 cm and 5.9 cm following the administration of Lz for one or 2 years to boys with either CDP or idiopathic short stature. This study by Hero et al is the first to report an improvement in the near-final height of boys with CDP treated with T + Lz.

*The near-final height of subjects treated with Lz did not differ from their mid-parental target height, while the near-final height was found to be lower than the mid-parental target height in boys treated with placebo. It is of interest to note that the delay in bone maturation achieved during treatment with Lz was maintained after cessation of treatment, as indicated by the more delayed bone age at near-final height in the Lz-treated boys. In all 3 of these studies, Lz effectively inhibited estrogen biosynthesis, as indicated by low estradiol and elevated FSH, LH, and testosterone concentrations in the Lz-treated group. Six months after the cessation of treatment, the concentrations of gonadotropins, T, and estradiol did not differ among patients treated with Lz and PI.*

*Larger numbers of patients, particularly short boys with idiopathic short stature and relatively early puberty, need to be studied to confirm these findings. Due to the gonadal androgen secretion noted during aromatase inhibition, careful follow-up of the progression of puberty, maturing spermatogenesis, and high-density lipoproteins of treated patients is necessary. In addition, the effect of low levels of estrogens on bone mass accrual during puberty and on body composition needs to be carefully followed. However, one could envision that this form of therapy could prove to be at least as effective as growth hormone and/or gonadotropin-releasing hormone analogs in increasing the final height of boys with idiopathic short stature entering into puberty at a relatively early age.*

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### References

1. Wickman S, Sipila I, Ankarberg-Lindgren C, Norjavaara E, Dunkel L. *Lancet*. 2001;357:1743–1748.
2. Hero M, Norjavaara E, Dunkel L. *J Clin Endocrinol Metab*. 2005;90:6396–6402.