

Adrenarche and Skeletal Maturation During Luteinizing-Hormone-Releasing Hormone Analogue-Suppression of Gonadarche

The increased secretion of adrenal androgens and the associated early signs of sexual maturation are called "adrenarche." However, during puberty the effects of adrenal androgens upon skeletal maturation are masked by the influence of the more potent gonadal steroid hormones. The investigators have employed a human model to examine the role of adrenal androgen secretion on skeletal maturation. They studied 29 children with central precocious puberty whose gonads were suppressed with an analogue of gonadotropin-releasing hormone factor (GnRH_a).

Dehydroepiandrosterone sulfate (DHEAS) levels, an index of adrenal maturation, were constant or increased in an age-expected manner. Ten of the 29 children had DHEAS levels above the normal range for their age. However, pre-

mature activation of the adrenal androgen axis did not always correlate with gonadarche; nor did the presence of pubic hair necessarily correlate with DHEAS levels. The increment in bone age over the increment in chronologic age decreased from 1.7 to 0.5, indicating that the GnRH_a induced a return to a prepubertal gonadal steroid environment; this was associated with a slowing of skeletal maturation. DHEAS levels correlated roughly with skeletal maturation rate before and during therapy.

Thus, the data suggest that adrenal androgens may contribute importantly to epiphyseal maturation, although there does not appear to be a strict correlation among bone age maturation, adrenal androgen secretion, and onset of gonadal activity, at least in these patients with premature puberty.

Wierman ME, Beardsworth DE, Crawford JD, et al: *J Clin Invest* 1986;77:121-126.

Editor's comment—*These data confirm and extend previous studies that have suggested the independent control of adrenal and gonadal steroid hormone secretion and the physical signs of pubarche and gonadarche. The data in the younger subjects show that premature activation of the gonadal axis does not necessarily imply premature activation of the adrenal axis. Moreover, the association between increasing levels of adrenal androgens and accelerated rates of skeletal maturation during childhood was confirmed. Those who remained pre-adrenarchial during therapy exhibited the greatest slowing of their skeletal advancement. Thus, adrenal androgens may play an important role in skeletal maturation.*