

The Relationship of Adrenal Androgens to the Secretory Patterns for Cortisol, Prolactin, and Growth Hormone During Early Puberty

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Summary

Serum concentrations of dehydroepiandrosterone (DHA), dehydroepiandrosterone sulfate (DHA-sulfate), cortisol, prolactin, and growth hormone were measured at half-hour intervals for 24 hr in five healthy children aged 8-13 yr. Their adolescent development was assessed by clinical staging, plus determinations of serum FSH, LH, testosterone and estradiol during both wakefulness and sleep. Correlative analysis indicates that there was synchronous secretion of DHA and cortisol, implying regulation of both by ACTH. With advancing age and sexual maturation, there was a progressive rise in mean serum DHA and DHA-sulfate levels, but no similar change in serum cortisol concentrations. There was evidence for enhanced secretion of both growth hormone and prolactin during sleep in all subjects (including one who

was hyperprolactinemic), but there was no obvious relationship between levels of these pituitary hormones and the early pubertal rise in adrenal androgens.

Speculation

The data suggest that ACTH is the final stimulus to both glucocorticoid and androgen secretion by the adrenal cortex. However, the relative increase in adrenal androgen production in early puberty implies a modulation of the pattern of steroidogenesis by some influence other than ACTH. The data do not suggest that either growth hormone or prolactin can be this "adrenarche" hormone. It seems more likely that the phenomenon of adrenarche represents an adrenocortical response to changes in serum levels of either pituitary gonadotropins or gonadal steroids.