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JOURNAL ARTICLE

Specific regulatory actions of dihydrotestosterone and estradiol on the dynamics of FSH secretion and clearance in humans

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The authors investigated immunoactive and bioactive follicle-stimulating hormone (FSH) secretion and clearance in six healthy young men during steady-state infusions of vehicle (basal, B, 28 hours), dihydrotestosterone (DHT, 4.5 days), or estradiol (4.5 days) accompanied by blood sampling at 10-minute intervals for 28 hours. Serum FSH concentrations were assayed by a two-site immunoradiometric assay (IRMA) and two separate in vitro bioassays (rat granulosa and Sertoli cell systems). FSH measurements included: 24-hour mean serum concentrations (IRMA and bioassay), multiple-parameter deconvolution of 24-hour pulsatile FSH time series and FSH release in response to exogenous gonadotropin-releasing hormone (GnRH) boluses (IRMA) to assess secretion and clearance, and circadian serum FSH concentration rhythms by cosinor analysis (IRMA). We found: 1) a significant decrease in 24-hour mean IRMA FSH concentrations during DHT infusion while both in vitro estimates of FSH bioactivity were unchanged; 2) significant decreases in the mass of IRMA FSH secreted per 24 hours during DHT infusion; 3) significant decreases in the IRMA FSH half-life during estradiol infusion without any change in FSH interpulse interval; 4) no steroidal effects on FSH secretory responses to exogenous GnRH; and 5) abolition of basal circadian FSH rhythms during sex-steroid infusions. Based on these findings, we conclude that steady-state sex-steroid hormone infusions selectively alter IRMA FSH secretion and clearance without affecting IRMA FSH pulse frequency or mean concentrations of bioactive FSH.

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