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JOURNAL ARTICLE

Concentrations of free testosterone, total testosterone, and androgen binding protein in the peripheral serum of male rats during sexual maturation

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To investigate the relationship between free testosterone and sexual maturation in the male rat, animals were decapitated every 5 days from 25 through 75 days of life. Serum was assayed for androgen binding protein and total testosterone by radioimmunoassay. Free testosterone concentrations were calculated from the total testosterone concentration and the free testosterone fraction. The free testosterone fraction was determined by ultrafiltration. The pubertal increase in relative prostate and relative seminal vesicle weights began between 45 and 50 days and 40 and 45 days, respectively. Although the over-all trend in the free testosterone fraction was to increase with increasing age ($r = 0.46$, P less than 0.0001), there was a significant secondary peak at 50 days. The serum concentration of androgen binding protein was highest on day 25, fell rapidly until day 40, and declined slowly thereafter. Despite these variations in both androgen binding protein and the free testosterone fraction during sexual maturation, the calculated serum concentration of free testosterone was remarkably similar in pattern to that of total testosterone ($r = 0.99$, P less than 0.0001). These data indicate that the serum concentration of total testosterone is an accurate reflection of the serum concentration of free testosterone during the sexual maturation of the male rat.

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