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## JOURNAL ARTICLE

# Daily testosterone and gonadotropin levels are similar in azoospermic and nonazoospermic normal men administered weekly testosterone: implications for male contraceptive development

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Weekly intramuscular administration of testosterone esters such as testosterone enanthate (TE) suppresses gonadotropins and spermatogenesis and has been studied as a male contraceptive. For unknown reasons, however, some men fail to achieve azoospermia with such regimens. We hypothesized that either 1) daily circulating serum fluoroimmunoreactive gonadotropins were higher or testosterone levels were lower during the weekly injection interval, or 2) monthly circulating bioactive gonadotropin levels were higher in nonazoospermic men. We therefore analyzed daily testosterone and fluoroimmunoreactive gonadotropin levels as well as pooled monthly bioactive and fluoroimmunoreactive gonadotropin levels in normal men receiving chronic TE injections and correlated these levels with sperm production. After a 3-month control period, 51 normal men were randomly assigned to receive intramuscular TE at 25 mg (n = 10), 50 mg (n = 9), 100 mg (n = 10), 300 mg (n = 10), or placebo (n = 12) weekly for 6 months. After 5 months of testosterone administration, morning testosterone and fluoroimmunoreactive follicle-stimulating hormone (FSH) and luteinizing hormone (LH) levels were measured daily for a 1-week period between TE injections. In addition, fluoroimmunoreactive and bioactive FSH and LH levels were measured in pooled monthly blood samples drawn just before the next TE injection. In the 100-mg and 300-mg TE groups, mean monthly fluoroimmunoreactive FSH and LH levels were suppressed by 86%-97%, bioactive FSH and LH levels by 62%-80%, and roughly half the subjects became azoospermic. In the 1-week period of month 6, daily testosterone levels between TE injections were within the normal range in men receiving placebo, or 25 or 50 mg of weekly TE, but were significantly elevated in men receiving 100 or 300 mg of weekly TE. At no point during treatment, however, were there significant differences in daily testosterone or fluoroimmunoreactive gonadotropin levels, or monthly bioactive gonadotropin levels between men achieving azoospermia and those with persistent spermatogenesis. This study, therefore, demonstrates that neither monthly nor daily differences in serum testosterone, or fluoroimmunoreactive or bioactive gonadotropins explain why some men fail to completely suppress their sperm counts to zero with weekly TE administration. Innate differences in the testicle's ability to maintain spermatogenesis in a low-gonadotropin environment may explain persistent spermatogenesis in some men

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