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JOURNAL ARTICLE

Pharmacokinetics and pharmacodynamics of a parenteral testosterone microsphere formulation in the male rat. Demonstration of dose dependence and controlled release

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This study examined the pharmacokinetics (the time course and pattern of testosterone release) and pharmacodynamics (effects on accessory sex organ weights, and serum LH and FSH levels) of a biodegradable testosterone microsphere formulation in the male rat. Two hundred seventy-five 55-day-old, sexually mature male rats underwent surgical orchiectomy or sham surgery and were divided into five groups as follows, to receive placebo or testosterone microsphere systems designed to release 25, 75, or 225 micrograms/day testosterone: group I: intact age-matched controls, sham operated, placebo microspheres; group II: surgically orchiectomized, placebo microspheres; group III: surgically orchiectomized, 25 micrograms/day testosterone microspheres; group IV: surgically orchiectomized, 75 micrograms/day testosterone microspheres; and group V: surgically orchiectomized, 225 micrograms/day testosterone microspheres. Serum testosterone levels were fairly uniform from day 2 to 85 without any significant trend. After day 100, serum testosterone levels gradually fell into the castrate range by day 196. There was a dose-dependent increase in serum testosterone levels in groups III, IV, and V over those seen in group II (castrated rats, placebo treated). Prostate and seminal vesicle weights were significantly lower in castrated animals treated with placebo or the 25-micrograms/day testosterone microsphere system (group III). Mean prostate and seminal vesicle weights in groups IV and V were not significantly different from those in intact controls (group I) in the first 85 days. After day 85-100, seminal vesicle and prostate weights declined gradually in groups III, IV, and V, approaching castrate range by day 196.(ABSTRACT TRUNCATED AT 250 WORDS)