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JOURNAL ARTICLE

Recovery of gonadal functions in the adult male rat following cessation of five-month daily treatment with an LHRH agonist

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This study describes the recovery of various parameters of the pituitary-gonadal axis following five months of daily treatment of adult male rats with a potent LHRH (luteinizing hormone-releasing hormone) agonist. Two-month-old male rats were treated daily with either 250 ng or 1 microgram of [D-Ser(TBU)6, des-Gly-NH2(10)]LHRH ethylamide (LHRH-A) s.c. for five months. At the end of treatment, prostate weights were within normal limits and seminal vesicle weights were only slightly decreased. While normal values were found three months following cessation of treatment, it was observed, somewhat unexpectedly, that ventral prostate and seminal vesicle weights were increased by 66 and 54%, respectively, five months after cessation of treatment with the 1 microgram daily dose of LHRH-A. Immediately following the five-month treatment period with either dose of the LHRH agonist, basal testicular levels of pregnenolone, progesterone (P), 17-OH-progesterone (17-OH-P), androstenedione, testosterone, androstane-3 beta,17 beta-diol and androst-5-ene-3 beta, 17 beta-diol were decreased, while the concentrations of dihydrotestosterone (DHT), androstane-3 alpha, 17 beta-diol (3 alpha-diol) and 17 beta-estradiol were increased. Three months following cessation of treatment, all basal testicular steroid levels had returned to normal except pregnenolone, P, 17-OH-P and androstenedione, which were still reduced by 40 to 60%. Five months following cessation of treatment, on the other hand, basal levels of all testicular steroids were 40 to 200% increased in the animals having received either dose of the LHRH agonist. The testicular steroidogenic responsiveness was measured 2 hours following the subcutaneous administration of 10 micrograms oLH. Following five months of daily treatment with the LHRH agonist, the main findings are a decreased response of pregnenolone, P, 17-OH-P and androst-5-ene-3 beta, 17 beta-diol, and an increased DHT, 3 alpha-diol and androstane-3 beta, 17 beta-diol responsiveness. Three months post-treatment, on the other hand, particularly at the higher dose of LHRH agonist, there was an increased responsiveness of androstenedione, T, DHT and 3 alpha-diol, a finding which was maintained after two additional months of recovery. Degenerative changes were observed in most tubules following five months of LHRH-A treatment. While most tubules returned to normal five months later, some tubules still showed degenerative changes. Plasma LH measured by radioimmunoassay (RIA) was elevated after five months of treatment with the daily 1 microgram dose, but all other values were within normal limits.(ABSTRACT TRUNCATED AT 400 WORDS)