**Detection of recombinant human luteinizing hormone and human chorionic gonadotropin doping in men**

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**Introduction:** Although hCG and LH are banned in sport, an effective detection test for recombinant human LH (rhLH) has not been defined.
**Objective:** To determine the time-course of rhLH and recombinant hCG (rhCG) on blood and urine hormone profiles in men to develop effective tests to detect rhLH and rhCG doping.
**Design:** Two randomized controlled studies with a 2 x 2 factorial design.
**Setting:** Academic research centre
**Participants:** Healthy male volunteers aged 18-45 yr
**Interventions:** In the rhLH study, men were randomized into (a) either of two single doses of rhLH (75 IU or 225 IU) and (b) suppression of endogenous LH and testosterone by nandrolone or no suppression. In the rhCG study men were randomized into (a) either of two single doses of rhCG (250 μg or 750 μg) and (b) suppression of endogenous LH and testosterone by nandrolone decanoate (ND) or no suppression. ND suppression comprised a single dose of 200 mg nandrolone decanoate 3 days prior to, and in the rhCG study an additional dose 1 day after, gonadotropin injection.
**Main Outcome Measures:** Serum and urine hCG, LH, T, T/LH ratio, urinary epi-testosterone (E) and urine T/E ratio.
**Results:** Neither rhLH dose produced a significant increase in serum or urine LH or T or in the T/E or T/LH ratios regardless of ND-induced suppression of endogenous LH and T. Nor did an even higher dose (750 IU) in 3 healthy men with unsuppressed gonadal axis. These findings were confirmed with two different commercial LH immunoassays together with correction for any influence of urinary sediment and dilution. Both rhCG dose produced a steep, dose-proportional increase in serum and urine hCG with increases in serum and urine T and suppression of serum and urine LH, regardless of hCG dose. Serum but not urine T was lowered by ND suppression. The T/LH ratio showed a progressive increase unrelated to rhCG dose or ND suppression whereas both rhCG and ND suppression minimally increased T/E ratio.
**Conclusions:** Although both doses of rhCG produce a striking increase in serum hCG and T with suppression of serum LH, at the doses used rhLH has no influence on serum or urine LH or T. rhLH is unlikely to be effective for performance enhancement that requires increased endogenous T production. Detecting rhLH doping by urine LH immunoassays using methods optimised for serum require validation but at present, for doses up to 750 IU, is unreliable. The T/LH ratio is a useful screening test for hCG doping although its reliability requires further evaluation.
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