

Combined evaluation of resting IGF1, N-terminal propeptide of type III procollagen and C-terminal cross-linked telopeptide of type I collagen levels might be useful for detecting inappropriate GH administration in female athletes.

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European Journal of Endocrinology 160: 753-758, 2009.

Objective: To detect exogenous recombinant human GH (rhGH) abuse in female athletes.

Design: GH-dependent markers were assayed in serum of 100 female athletes (control group) and in a subgroup of nine female subjects treated with rhGH (0.09 IU/kg body weight, 6 days/week for 3 weeks).

Methods: Cut-off values (mean + 2 S.D.) for IGF1, N-terminal propeptide of type III procollagen (PIIINP) and C-terminal telopeptide of type I collagen (ICTP) were calculated and arbitrary scores (1.5 or 2.0) were assigned to abnormal markers. By using the sum of individual marker scores, positive (≥ 3) or negative (< 3) scores were obtained.

Results: None of the control group obtained a positive score (≥ 3). Abnormal IGF1, PIIINP and ICTP levels were found in 61.4, 54.5 and 11.4% samples of the treated group. Overall, positive cases were present in 43.2% blood samples drawn in subjects treated with rhGH and in 26% of samples after rhGH withdrawal. The sensitivity of the detection approach was 66.6% at the end of 3-week rhGH treatment and 11.1% at the 15th day of rhGH withdrawal, while the specificity was 100%.

Conclusion: Detection test for rhGH administration appears less sensitive in female (66.6%) than in male athletes (previous observation, 100% after 3 weeks of comparable rhGH dose), but shows a similar specificity (98.5-100%). Since athletes supposedly use very high doses and long-term administration of rhGH for doping purposes, it is foreseen that the here-in detection test would in future increase its strength.

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