

## **Supra-physiological rhGH administration induces gender-related differences in the hypothalamus-pituitary–thyroid (HPT) axis in healthy individuals.**

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Purpose: The use of recombinant human growth hormone (rhGH) is a common habit among athletes. While the effects of rhGH administration have been described with contrasting results in males, no data exist in females to date. The aim of the present study was to evaluate the effects of rhGH administration on TSH, FT<sub>4</sub> and FT<sub>3</sub> levels and the time requested to return to baseline values after treatment withdrawal.

Methods: Twenty-one healthy trained male and female athletes were treated with 0.03 mg rhGH/kg body mass 6 days/week for 3 weeks. We collected blood samples immediately before the first daily rhGH administration, at 3, 4, 8, 15 and 21 days of treatment and at 3 and 9 days after rhGH withdrawal.

Results: In males, rhGH administration induced a significant ( $p < 0.01$ ) early and stable TSH decrease and IGF-I increase, and a delayed FT<sub>4</sub> reduction without FT<sub>3</sub> modification, suggesting a central regulatory mechanism. In females, rhGH administration induced a significant ( $p < 0.01$ ) early and transient TSH decrease and IGF-I increase, and a transient reduction in FT<sub>4</sub> without any changes in FT<sub>3</sub> concentrations. rhGH withdrawal was associated with a prompt normalization of TSH and FT<sub>4</sub> levels in males, while in females the effects of rhGH treatment had already disappeared during the last period of treatment.

Conclusion: We suggest that rhGH inhibits TSH at central level both in males and females. The pattern of normalization was different in the two genders probably.

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