

## Long-Term Effects of Growth Hormone Replacement Therapy on Thyroid Function in Adults with Growth Hormone Deficiency

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Marco Losa,<sup>1</sup>  
Marina Scavini,<sup>2</sup>  
Elisa Gatti,<sup>2</sup>  
Alessandro Rossini,<sup>2</sup>  
Sara Madaschi,<sup>2</sup>  
Ilaria Formenti,<sup>2</sup>  
Andrea Caumo,<sup>3</sup>  
Christine A. Stidley,<sup>4</sup> and  
Roberto Lanzi<sup>2</sup>

<sup>1</sup>Department of Neurosurgery, Istituto Scientifico San Raffaele; Università Vita-Salute, Milan, Italy.

<sup>2</sup>Diabetes and Endocrinology Unit, Department of Medicine; Istituto Scientifico San Raffaele, Università Vita-Salute, Milan, Italy.

<sup>3</sup>Nutrition Unit, Department of Medicine; Istituto Scientifico San Raffaele, Università Vita-Salute, Milan, Italy.

<sup>4</sup>Division of Epidemiology and Biostatistics, Department of Internal Medicine, University of New Mexico Health Sciences Center, Albuquerque, New Mexico.

Address reprint requests to:

Marco Losa, M.D.

Department of Neurosurgery

Istituto Scientifico San Raffaele

Università Vita-Salute  
Via Olgettina 60

20132 Milano

Italy  
E-mail:

**Background:** Clinical studies on the effect of growth hormone (GH) on thyroid function in patients with GH deficiency are contradictory. Further, the majority of published observations are limited to the first 6–12 months of GH replacement therapy. The aim of our study was to estimate the incidence of clinically relevant hypothyroidism in a cohort of patients with adult GH deficiency (AGHD) during long-term therapy with recombinant human GH (rhGH).

**Methods:** The study was designed as a retrospective collection of data on thyroid function in 49 AGHD patients of whom 44 (90%) had multiple hormone deficiency. Thirty-seven patients (76%) were on stable levothyroxine (LT4) replacement therapy (HYPO), and 12 (24%) were euthyroid (EUT). Therapy with rhGH was started at a dose of 3.5 µg/kg body weight and adjusted according to insulin-like growth factor-I (IGF-I) levels. At baseline, 6 months, 12 months, and yearly thereafter we measured free triiodothyronine (fT3), free thyroxine (fT4), thyroid-stimulating hormone, and IGF-I. Study outcome was fT4 level below the normal range (9 pmol/L), irrespectively of fT3 or thyroid-stimulating hormone levels.

**Results:** During a follow-up of 115 patient-years, mean fT4 level decreased significantly, although remaining within the normal range ( $p=0.0242$ ; month 48 vs. baseline). The largest decrease was between baseline and month 6, when fT4



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l, 0.33–2.53) per 1 unit ( $\mu\text{g}/\text{kg}$  body weight) increase in rhGH dose.  
group) and 6.7 (EUT group) events per 100 patient-years.

**Conclusion:** We confirm that in patients with AGHD, rhGH therapy is associated with a small, although significant, decrement of fT4 in the first 6 months of replacement therapy. However, the incidence of hypothyroidism is low. Monitoring of thyroid function during rhGH therapy is advisable, particularly in the first year of therapy when the largest decrease in fT4 occurs.