Forschungsgesuch Meinhardt (Stipendium)

GC-induced catabolism, impact of anabolic hormones or exercise

Das folgende Abstract repräsentiert ein Forschungsprojekt, das im Rahmen des Research Fellowships des Stipendiaten erfolgreich bearbeitet wurde:

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Modulation of growth hormone action by sex steroids.

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Growth hormone (GH) is a major regulator of growth, somatic development and body composition. Sex steroids can act centrally by regulating GH secretion and peripherally modulating GH responsiveness. This review addresses data of potential clinical relevance on how sex steroids modulate GH secretion and action, aiming to increase the understanding of sex steroid/GH interactions and leading to improved management of patients. Sex steroids regulate GH secretion directly as well as indirectly through IGF-I modulation. Testosterone stimulates GH secretion centrally, an effect dependent on prior aromatization to oestrogen. Oestrogen stimulates GH secretion indirectly by reducing IGF-I feedback inhibition. Whether oestrogen stimulates GH secretion centrally in females is unresolved. Gonadal steroids modify the metabolic effects of GH. Testosterone amplifies GH stimulation of IGF-I, sodium retention, substrate metabolism and protein anabolism while exhibiting similar but independent actions of its own. Oestrogen attenuates GH action by inhibiting GH-regulated endocrine function of the liver. This is a concentration-dependent phenomenon that arises invariably from oral administration of therapeutic doses of oestrogen, an effect that can be avoided by using a parenteral route. This strong modulatory effect of gonadal steroids on GH responsiveness provides insights into the biological basis of sexual dimorphism in growth, development and body composition and practical information for the clinical endocrinologist. It calls for an appraisal of the diagnostic criteria for GH deficiency of GH stimulation tests, which currently are based on arbitrary cut-offs that do not take into account the shifting baseline from the changing gonadal steroid milieu. In the management of GH deficiency in the hypopituitary female, oestrogen should be administered by a nonoral route. In hypopituitary men, androgens should be replaced concurrently to maximize the benefits of GH. In the general population, the metabolic consequences of long-term treatment of women with oral oestrogen compounds, including selective oestrogen receptor modulators, are largely unknown and warrant study.