

Muscle expressions of MGF, IGF-IEa, and myostatin in intact and hypophysectomized rats: effects of rhGH and testosterone alone or combined.

Rigamonti AE, Locatelli L, Cella SG, Bonomo SM, Giunta M, Molinari F, Sartorio A, Müller EE.

Hormone and Metabolic Research 41: 23-29, 2009.

Myostatin and mechano-growth factor (MGF), an isoform of insulin-like growth factor-I (IGF-I), are two important regulators of muscle hypertrophy. The aim of the present study was to investigate the effects of recombinant human growth hormone (rhGH) and/or testosterone on muscle MGF/IGF-IEa/myostatin expression in intact and hypophysectomized rats treated for 15 d with 1) saline or rhGH, 2) sesame oil or testosterone, 3) saline+sesame oil, or rhGH+testosterone (first experiment) or for 7 d with saline or rhGH (second experiment). Animals were killed by decapitation 24 h or 4 d after the last injection (first or second experiment, respectively). Muscle expressions of MGF, IGF-IEa, and myostatin were determined by RT-PCR. A significant increase in the weight of gastrocnemius muscle was observed only in hypophysectomized rats treated with rhGH alone or in combination with testosterone. Administration of rhGH to hypophysectomized rats caused a marked increase in both MGF and IGF-IEa muscle mRNA levels (without any change in the muscle expression of myostatin), an effect that was abolished when testosterone was combined with rhGH. Conversely, in intact rats rhGH increased myostatin muscle mRNA levels without affecting those of MGF and IGF-IEa. Testosterone, alone or combined with rhGH, induced an inhibition of myostatin expression in the muscle of intact rats, but did not change muscle paradigms of hypophysectomized rats. In conclusion, rhGH and/or testosterone anabolic effects in the muscle are mediated by a different expression of MGF/IGF-IEa/myostatin, which is related to the pituitary function.

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