Skeletal muscle characteristics and motor performance after 2-year growth hormone treatment in adults with Prader-Willi Syndrome.

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Context: In adults with Prader-Willi syndrome (PWS), abnormal body composition with decreased lean body mass and skeletal muscle (SM) volume has been related to altered GH secretion and may possibly contribute to greatly reduced motor capacity.

Objective: The scope of the study was to test the hypothesis that GH treatment has favorable effects on SM characteristics and motor performance in adults with PWS.

Design, setting, and participants: Fifteen obese PWS subjects (nine males and six females; age range, 19-35 y; body mass index, 37.7.-59.9 kg/m^2) were investigated before and after 12 (GH12) and 24 (GH24) months of GH treatment.

Main outcome measures: SM cross-sectional area and SM attenuation were determined with computed tomography at the lumbar and midthigh levels. Maximal isometric handgrip strength and isokinetic knee extension peak torque were measured. Motor performance was evaluated with different indoor walking tests, whereas exercise endurance was assessed with a treadmill incremental test to exhaustion.

Results: A condition of severe GH deficiency was found in six patients (40%). GH treatment significantly increased lean body mass (GH12, *P*< .05; GH24, *P*< .05), reduced percentage of body fat (GH12, *P*< .05; GH24, *P*< .05), and augmented SM cross-sectional area and SM attenuation of both lumbar (GH12, *P*< .01; GH24, *P*< .001) and thigh muscles (GH24, *P*< .05). Handgrip strength increased by 7% at GH12 (*P*< .05) and by 13% at GH24 (*P*< .001). Peak torque of knee extension extrapolated at zero angular velocity was significantly higher at GH24 (*P*< .01), and exercise endurance rose by 13% (*P*< .05) and 17% (*P*< .05) before exhaustion at GH12 and GH24, respectively, whereas no change was detected with walking tests. No significant difference in the response to GH treatment was detected between patients with and without GH deficiency.

Conclusion: Long-term GH treatment in adult PWS patients improves body composition and muscle size and quality and increases muscle strength and exercise tolerance independently from the GH secretory status.