

$-1.9 \pm 1.3$  to  $-0.7 \pm 1.2$ , and maximum stimulated GH and more frequent GH injections were significant predictors of first-year growth rates. They were not predictive of adult height or adult height SDS.

Blethen SL, et al. *J Clin Endocrinol Metab* 1997;82:418-420.

**Editor's comment:** This is the most definitive study done to date to answer the questions posed when the study was first begun. Short GHD children attain normal heights when the diagnosis of GHD is made early and adequate GH therapy to produce catch-up growth is initiated early in life.

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## Low-Dose Recombinant Human Growth Hormone Increases Body Weight and Lean Body Mass in Patients With Short Bowel Syndrome

A randomized, double-blind, placebo-controlled, crossover study using low-dose (0.17 mg/kg/wk) recombinant hGH in individuals with short bowel syndrome (SBS) due to Crohn's disease is reported. Ten adults with surgically created SBS for more than 1 year participated in the study. All had normal 24-hour growth hormone profiles. Their mean small intestinal length was 1.3 m; 6 of the 10 had an ileojejunostomy. All required oral or parenteral fluids. One was maintained on parenteral nutrition. Lean body fat, bone mineral content, and bone mineral density were measured by dual-energy X-ray absorptiometry (DEXA). Fecal samples were collected on a metabolic ward and pooled in 4-day batches.

During treatment with rhGH, body weight increased by  $2.3 \pm 0.8$  kg ( $P=0.005$ ) (Figure 1). Lean body mass increased  $5.6 \pm 1.9\%$  ( $P=0.005$ ) while body fat did not change significantly. There were small but significant changes in bone mineral content but no significant changes were seen in total body bone mineral density. Mean daily energy intake from food was 3,500 kcal. Urinary nitrogen excretion did not change during this study, but nitrogen balance was significantly improved,  $4.8 \pm 2.9$  g/d versus  $2.3 \pm 2.9$  g/d ( $P=0.011$ ). The authors suggest that these studies demonstrate that short-term, low-dose GH therapy for as little as 8 weeks can increase body weight, lean body mass, total body water, and bone mineral content without clinical signs of edema or altered glucose metabolism. Thus, this may be a useful adjunct to nutritional support for patients with SBS.

Ellegard L, et al. *Ann Surg* 1997;225:1:88-96.

**Editor's comment:** These interesting studies suggest ways in which the anabolic effects of GH may be useful in individuals with SBS secondary to Crohn's disease. Recently, growing adolescents with inactive Crohn's disease (Digestive Diseases and Sciences 1996;41:1754-1759) were reported to have increased energy expenditure as compared to both healthy growing adolescents and non-growing subjects with inactive Crohn's disease. Until we understand more about the pathophysiology of Crohn's disease, suggesting alternatives to increased nutrient intake as a means of improving growth in these individuals may not be possible. However, the studies by Ellegard et al suggest that individuals with Crohn's disease and SBS may

benefit significantly from the anabolic effects of rhGH. Byrne et al (Annals of Surgery 1995;222:243-255) studied rhGH in addition to a high-carbohydrate, low-fat diet with added glutamine in 17 adults with SBS and demonstrated significant improvement in absorption of protein and decrease in stool output. Although the studies performed by Byrne et al and those reported above by Ellegard and colleagues were performed in adults, the potential implications for children with congenital or acquired SBS are apparent. Randomized, multicenter trials are currently in progress using both pediatric and adult populations to evaluate this new therapeutic regimen. The estimated potential reduction in health-care costs associated with this treatment should be an incentive for industry support of these studies. There is reason to be optimistic that this could be an additional beneficial use of rhGH.

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