

Short Stature and Growth Hormone Therapy: A National Study of Physician Recommendation Patterns

The objective of this study was to learn the attitudes of pediatric endocrinologists (PEs) regarding prescribing growth hormone (GH) to short children. Of 534 anonymous surveys, 434 (81.3%) were returned. Extensive planning of the questionnaire permitted the collection and analysis of data revealing the attitudes of 340 of the 434 respondents who currently manage short stature in children. Of the children currently being treated, 58% were GH deficient (GHD) and 15% had Turner syndrome (TS). The remaining 27% had other causes for short stature. Eight case histories, differing only in physiologic growth variables (extent of short stature, growth velocity, normal or abnormal bone age) were presented and the respondents were asked whether they were likely to recommend GH for each case. Three additional sets of decisions focusing on the contingency variables of price and family wishes also were included in the questionnaire. The first 2 contingencies proposed that the price of GH therapy fell from approximately \$13,000 per year to \$2,000 per year or \$100 per year. In the third contingency, physicians were asked their recommendation if the family strongly desired GH therapy, assuming that the price remained at current levels.

Analyses of the data revealed 3 noteworthy patterns in the responses. First, 68.1% agreed that GH use for non-GHD short stature has increased in the past 5 years and that the physician's knowledge about family finances is marginal in the overall decision-making process whether to prescribe GH. Second, PEs believe that short stature matters and has dysfunctional emotional impact on many children and adults. Third, a lack of consensus existed among the PEs regarding the perceived efficacy (adult height and long-term adverse effects) of GH therapy for non-GHD children.

In applying a logistic model to physicians' decisions to recommend GH, 3 sets of predictors were used: (a) the physiologic growth variables previously discussed; (b) contingency variables, ie, treatment cost and family wishes; and (c) physicians' beliefs about short stature and GH treatment. The growth rate was very important, as the likelihood of GH being prescribed increased 3.4-fold for a growth rate below the 3rd percentile versus the 3rd to 10th percentiles. A height falling below -3 standard deviations (SD) increased by 2.8-fold the likelihood of GH being prescribed than if the patient was between -2 and -3 SD below

the mean. A normal bone age instead of a delayed bone age increased the recommendation to use GH. Also, boys with comparable shortness to girls, corrected for sex, were 1.3-fold more likely to receive GH than girls. Physicians were sensitive to cost and would have significantly increased recommending the use of GH if it cost \$2,000 per year instead of \$13,000 per year. A cost of \$100 per year would have further significantly increased recommendations. Family wishes clearly influenced the recommendations made by many physicians. In addition, the odds of a positive recommendation increased 13% if the physician believed GH would add at least 1 inch to the ultimate height of non-GHD children. The authors concluded from analyses of the data that physiologic factors, contingency factors, and belief factors exert independent and additive effects on recommendations for GH therapy.

The conclusions that can be drawn from this study have several implications for GH and analogous interventions such as treatment of attention deficit disorder, in vitro fertilization, and genetic testing. Like GH therapy, these analogous interventions hold promise for increasing the quality of life for a targeted patient population, but with uncertain risks and benefits and often at considerable financial cost. As HMOs try to limit the use of GH because of a lack of consensus concerning its use, even referrals for short stature may be limited, which would be unfortunate since referral not only should address whether GH is recommended but also elucidate whether a cause for short stature requiring therapies other than GH is present.

Cuttler et al. *JAMA* 1996;276:531-537.

Editor's comment: *This article demonstrates the optimal use of scientific methodology in constructing a questionnaire that will yield interpretable data. Our readers are encouraged to review the entire article for its multiple contributions, particularly the insight it yields into the factors that may prompt the prescribing of other agents that may improve the patient's quality of life but not necessarily significantly improve the ultimate height of the patient.*

Although originally published in 1996, this article seemed worthy of abstracting in GGH as it is an excellent corollary to the 2 lead articles in this issue.

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Considerations Related to the Use of Recombinant Human Growth Hormone in Children

This is an excellent overview of different aspects of the use of growth hormone (GH) by the Committee on Drugs and the Committee on Bioethics of the American Academy of Pediatrics. Some important points are summarized here, but the reader is encouraged to review the complete article published in *Pediatrics* 1997;99:122-129.

BACKGROUND

Recombinant GH Products

The biosynthetic process involves a chemical synthesis of the DNA fragment encoding the first 24 amino acids and complementary DNA copies of messenger RNA prepared from human pituitary cells. The entire DNA sequence is intro-