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Effect of Two-Year Growth Hormone Therapy on Height Outcomes in Pubertal Boys with Idiopathic Short Stature

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Objective: This study aimed to evaluate the clinical effects of a two-year growth hormone (GH) therapy in pubertal boys diagnosed with idiopathic short stature (ISS). The primary focus was to assess changes in height standard deviation score (SDS) and determine the potential impact of GH on final adult height without additional interventions influencing pubertal progression.

Methods: A total of 30 boys with ISS were randomly selected and treated exclusively with GH. The initial dosage was 0.03 mg/kg and was gradually increased to a maximum of 0.055 mg/kg over the course of the treatment. Pubertal onset was determined based on testicular volume, with a threshold of ≥4 mL as assessed using the Prader orchidometer. Height measurements, pubertal progression, and overall growth response were closely monitored at regular intervals over the two-year study period.

Results: After two years of GH therapy, height SDS increased in most participants, though individual responses varied:

- 16 boys (53%) exhibited a height gain of 0.5–1 SDS,
- 10 boys (33%) achieved a height increase of >1 SDS,
- 4 boys (13%) showed a height gain of <0.5 SDS.

Final adult height was attained in 7 boys (23%), with the tallest measuring 169 cm and the shortest 155 cm. An additional 11 boys (37%) had reached Tanner stage 4 and were approaching their final adult height, with heights ranging from 158 cm to 171 cm. Notably, only 2 boys (7%) attained a height of ≥170 cm. The data suggest that while GH therapy contributed to improved height SDS during treatment, its effect on achieving a significantly taller final height was limited.

Conclusion: GH treatment in pubertal boys with ISS resulted in a moderate increase in height SDS over two years, yet its influence on final adult height

remained restricted. The findings indicate that in pubertal ISS patients, GH therapy alone—without additional interventions aimed at modulating pubertal progression or enhancing height velocity—may not be sufficient to achieve substantial improvements in final stature. Further research is warranted to explore potential strategies, such as optimizing treatment timing, individualized dosing regimens, or combined therapeutic approaches, to enhance final height outcomes in this patient population.

Disclosure of interest: None declared