

Pros and Cons of Human Growth Hormone Therapy

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Introduction

Growth hormone is one of the most important factors in promoting growth in children and adolescents. Growth hormone is a potent growth-promoting hormone that is released from the pituitary gland when we sleep. The highest quantity of growth hormone is released throughout adolescence, when the human body is growing at its fastest rate. Growth hormone stimulates numerous cells and tissues in the body, although it is especially active in growing the length of long bones and the thickness of many soft tissues, such as the skin. A person's development can be drastically altered by abnormal growth hormone production. Abnormally growth hormone production throughout infancy and adolescence can result in excessive lengthy bone development, resulting in a person who is literally a giant. Acromegaly is a disorder that occurs when the overproduction of growth hormone persists past the time when long bones fuse in adolescence. The fused bones in acromegaly continue to thicken, causing deformity of the limbs, face, and extremities. Underproduction or lack of growth hormone throughout a person's growing years, on the other hand, can cause delayed development, below normal height, and, in severe cases, dwarfism.

Growth hormone derived from human cadaver pituitary glands was effectively utilized to treat children with growth hormone insufficiency in the 1950s, indicating that exogenous supplies of growth hormone might be used to treat children who do not manufacture enough of their own [1].

However, due to the difficulty and cost of acquiring human growth hormone, only children with a "marked deficit of growth hormone" were eligible for growth hormone therapy. Furthermore, a tiny percentage of individuals who received cadaveric hGH later acquired Creutzfeldt-Jacob syndrome, which was an unintended consequence of early growth hormone treatment. A virus that infected the growth hormone preparation caused gradual nerve tissue degeneration in these individuals.

In the 1980s, scientists used recombinant DNA technology to introduce genes for hormones like growth hormone and insulin into non-harmful *E. coli* bacteria. These bacteria then functioned as tiny factories, producing vast amounts of pure hormone. We now have the potential to manufacture a practically endless supply of pure and safe human hormones that may be utilised to treat disease as a result of biotechnology. Because of the improved availability of safe hGH, its therapeutic usage can now be broadened to encompass a variety of additional growth-related illnesses in children, such as Turner's syndrome (a chromosomal abnormality), growth hormone shortage, and renal failure. A number of scientific and clinical research have led to a widespread consensus among physicians that growth hormone treatment in certain growth abnormalities is both effective and safe [2].

Studies from Sweden, Europe, and the United States have found that treating children with Turner's disease with growth hormone results in a significant increase in growth velocity. Growth hormone therapy stimulates growth velocity in growth hormone-deficient children (from approximately 4 cm/year to 10 cm/year) and, more importantly, results in significant increases in final adult height when

compared to predicted height without growth hormone or the height of untreated patients.

The improved availability of growth hormone has also resulted in the extension of growth hormone therapy to encompass conditions where its utility is still debatable, such as familial and idiopathic short stature. Despite the fact that two major Swedish and Dutch studies of growth hormone therapy in children with short stature reported significant increases in growth velocity during the first year of treatment, many patients required higher growth hormone doses in subsequent years to maintain these growth velocities [3]. Despite the higher growth rates revealed in these investigations, the increases in ultimate anticipated adult heights were minor.

Growth Hormone and Aging

The organ system's function deteriorates as individuals age, and the body's composition begins to shift. Skin and bones grow thinner and less elastic when lean bodily tissues such as muscles are gradually replaced by fat, and skin and bones become thinner and less malleable. Surprisingly, these undesired changes in body composition may be linked to the body's decreasing production of growth hormone as one gets older. Replacement of diminishing growth hormone levels with growth hormone injections might potentially reduce or avoid these age-related alterations, according to reasoning.

The National Institutes of Health is now sponsoring many large-scale clinical trials examining the effects of growth hormone in older persons, and the pharmaceutical sector is also funding comparable research. However, the efficacy of taking growth hormone in healthy older people is now uncertain at best. Because there are so many unanswered questions about the use of growth hormone in the elderly and adults with growth hormone deficiency, a recent editorial stated that its widespread use now and in the near future is not warranted, and that scientific and financial resources would be better spent evaluating the effectiveness of hGH in patients with severe catabolic illness [4].

Growth Hormone Abuses

There is also growing worry that growth hormone might be overused by athletes and sports teams. To improve strength and performance, some young athletes who are driven by a desire to win are increasingly resorting to medications like anabolic steroids. Growth hormone has similar body-building effects as steroids, but it is difficult to detect since it stays in the body for a shorter amount of time. Additionally, sports commissions do not employ growth hormone testing as frequently

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Received November 05, 2021; Accepted November 19, 2021; Published November 26, 2021

Citation: Miller G (2021) Pros and Cons of Human Growth Hormone Therapy. J Diabetes Clin Prac 4: 140.

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as they use drugs tests. Athletes also appear to believe that growth hormone has less negative side effects than anabolic drugs.

The concept that if little growth hormone is good, more must be better is ingrained in the usage of growth hormone for athletic improvement or age reversal. Taking greater dosages or more frequent injections of growth hormone in the hopes of speeding up or enhancing its ostensibly good effects might be dangerous. By increasing the amount of growth hormone consumed, the risk of major adverse effects increases dramatically. While it may be years before accurate assessments of the consequences of growth hormone misuse are feasible, one need only study the condition of acromegaly, in which growth hormone levels have been high for many years, to observe the harmful effects of persistent excess growth hormone on the body [5]. These people have serious cardiac, skeletal, and neurological system abnormalities, as well as an increased risk of heart disease and

malignancies. Such anomalies can also be seen over time in those who misuse or abuse growth hormone.

References

1. Rudman D, Feller AG, Hoskote S, Gregory AG, Pardee YL, et al. (1990) Effect of human growth hormone in men over 60. *N Engl J Med* 323: 1-6.
2. Raben MS (1962) Clinical use of human growth hormone. *N Engl J Med* 266: 82-86
3. Neely KE, Rosenfeld RG (1994) Use and abuse of human growth hormone. *Ann Rev Med* 45: 407-20.
4. Albertsson-Wikland K (1988) Growth hormone treatment in short children short-term and long-term effects on growth. *Acta Paediatr Scand* 343: 77-84.
5. Hopewood N, Hintz RL, Gertner JM, Kenneth MA, Ann JJ, et al. (1993) Growth response of non-growth hormone-deficient children with marked short stature during three years of growth hormone therapy. *J Pediatr* 123: 215-22