Short and Sweet:
Human Growth Hormone for “Normal” Children
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Use of human growth hormone (hGH) has become surprisingly popular among children of normal height in the United States. Many supporters of hGH believe that taking the hormone can remarkably improve a child’s self-confidence and social interactions with others. However, some argue that the long-term physical and psychological effects of taking hGH could be rather harmful. This paper assesses the benefits and risks of giving “normal” children human growth hormone. Strong support is shown against giving “normal” children hGH, due to its potentially dangerous effects. In addition, emphasis is placed on the need of society to rid itself of the idea that shortness is a sickness. Instead of changing short individuals to fit a norm, it is essential that society change its perceptions of what is normal. Ultimately, it is important that individuals aware themselves of the effects of giving hGH to “normal” children, especially as further research is conducted on the hormone.

As a young boy, my friend John was unusually short for his age. At the age of six, he was about 6 inches shorter than most of the children in his first grade class. However, he never thought much about his short stature before going to school, probably because shortness was commonplace in his family: His mother was short, his aunts and many of his cousins were short. In fact, he was one of the taller members of his family. Thus, it was not until elementary school that he learned what it really meant to be short. He was not only shunned by the students in his class, he was made the object of ridicule. The boys in his class would make comments such as, “You’re so small I need a microscope to see you!” and would often chase him on the playground, playing “catch the midget.” He never really understood why he was treated so differently by his peers. All he knew was that he wished he could do something about it.

For the past year or so, many kids like John have been able to take human growth hormone (hGH) to help them grow taller. These children do not have a disease or a hormone deficiency that causes them to be short; all they have to blame for their shortness is genetics. Although some would think otherwise, these children are “normal.” They are only interested in hGH because of the potential social benefits it could afford them. This paper will explore the benefits and risks of giving children human growth hormone. In addition, the ethical concerns of treating “normal” children with hGH will be discussed.

Biological Background of hGH
Growth hormone, also known as somatotropin, is a protein produced by the pituitary gland. The hypothalamus, a structure in the brain, sends signals to this gland to produce growth hormone, which then travels through the bloodstream to other parts of the body. This hormone is known to instigate the growth of bones and other body tissues. Growth hormone directly stimulates epiphyseal growth plates in bones, which control bone elongation. In addition, growth hormone triggers the release of the protein insulin-like growth factor-I (IGF-I), which prompts the growth of muscle, bone, and other body tissues. This protein, in turn, regulates the release of growth hormone from the pituitary gland.1

When hGH is injected into a child’s body, it stimulates an increase in the production of human growth hormone and causes the child to grow. Multiple studies conducted on the effects
of human growth hormone in hGH-deficient children suggest that hGH can help children grow on average an extra 1.5 to 2.8 inches of height by adulthood. However, hGH does that work as easily as some think. Most children must continue to take six hGH shots a week for about four to five years before a change in their height is apparent. Also, it is important to note that long-term studies have not been conducted on the effect of growth hormone in “normal” children. There is a possibility that non-hGH-deficient children may not even react to increased levels of hormone injected into their bodies.

**History of hGH**

The human growth hormone was first extracted from the pituitary gland in 1958 by a well-known endocrinologist named Maurice Raben. Raben’s use of purified hGH in hormone-deficient children was effective and revolutionized a movement in which doctors all around the world began extracting hGH from the pituitary gland of cadavers. Although the process of obtaining hGH was successful, it was soon discovered that natural hGH caused neurological disorders in many patients. This finding led to the use of hGH strictly for individuals with growth hormone deficiency.

In 1985, researchers were able to produce hGH synthetically, due to advances in gene technology. Synthetic hGH was soon approved by the Food and Drug Administration (FDA) and given to children who were deficient in growth hormone. According to clinical trials done by hGH manufacturer Eli Lilly, hormone-deficient children taking the synthetic drug grew on average 1 to 1.5 inches more than the placebo group. Sixty-two percent of the children tested grew more than two inches over their predicted adult height, and 31 percent gained more than four inches. Despite the children’s height increase, the research was questioned due to the high dropout rate of children in the study. Many believe that the subjects who endured the study were the ones who demonstrated the most extreme growth and were not representative of the population.

By 2003, the FDA approved the use of Humatrope, a synthetically prepared hGH nearly identical to the hGH secreted by the pituitary gland, for the treatment of non-hormone-deficient children who were expected to grow no taller than five feet, three inches, in the case of boys and four feet, eleven inches, in the case of girls, putting them in the in the bottom 1.2 percentile. The use of hGH in these “normal” children, who are identified as having idiopathic short stature (ISS), is still highly debated today.

**Possible Advantages of Taking hGH**

The use of human growth hormone is known to provide social advantages to individuals who are short. First of all, studies show that increased height is correlated with employment rates and the likelihood of finding a spouse. Thus, by taking the hGH, shorter individuals increase their chances of finding a job and getting married. In addition, we live in a society in which sports players are envied. Due to the fact that increased height is often advantageous when playing sports, many children feel the need to take growth hormone to allow them to be more competitive in athletics. These factors—and the verbal abuse short children commonly face—add to the lowered self-esteem and increased aggression found in these individuals. It is likely that taking hGH would help them gain self-confidence and avoid aggression, characteristics that are especially important for younger children who are just learning to deal with social issues in the outside world.

**Possible Disadvantages of Taking hGH**

There are numerous risks associated with the use of human growth hormone that many people are unaware of. First of all, despite the extensive research done on hGH, many of the long-term effects of taking hGH are still unknown. For instance, some researchers speculate that taking of hGH can cause cancer, due to the fact that it stimulates the liver to produce
IGF-1, which is associated with breast cancer. In addition, some researchers believe that intake of hGH can cause resistance to the hormone insulin, which can lead to increased levels of blood sugar and the possible onset of diabetes. It is probable that with time, researchers will confirm the link between these diseases and taking hGH.

According to geriatrician Dr. Rajbans Singh, “You shouldn’t take hGH if you don’t need it, as too much of the hormone is not good. ... Growth-hormone therapy should be for therapeutic use only because it has side effects in excess.”2 Some common side effects that are associated with taking hGH include an increase in blood pressure, problems with fluid retention, joint pain, and swelling of soft tissues in the body. Antibodies to the body’s own growth hormone can also develop with the intake of hGH. This outcome would be particularly distressing to “normal” children who were not actually deficient in growth hormone. These children would now develop a growth problem by taking hGH. In other words, taking the hGH would counter their ability to grow.7

The psychological and physical risks children face from the repeated injections required for the treatment. According to Jenny Everett, whose nine-year-old brother, Alex, takes hGH, the procedure of injecting hGH into your body is one of the most stressful experiences a child can go through. Every day her brother has to swipe an alcohol-soaked gauze pad over his thigh, insert a three-inch needle into his leg, turn a knob on the pen five times and watch as his dose is inserted into his leg. Not only do the injections cause her brother a lot of pain, it has made him look at himself in a negative light. Children like Alex often acquire a negative image when they believe that they are going through such a painful process because something is wrong with them. Such a view of themselves can cause these children to have destructive social problems in the future.3

The large expense associated with buying hGH is another disadvantage of using hGH in children. On average, hGH costs about $35,000 for each inch a child grows.6 Many children who are hormone deficient can get their insurance company to cover their treatment; however, it is unlikely that any insurance company would pay for the treatment of a child with idiopathic short stature. Families of such children are left with the stress and burden of paying such expenses themselves.

**SOCIAL EFFECTS OF TREATING “NORMAL” CHILDREN WITH hGH**

Today, the use of human growth hormone in “normal” children raises many ethical issues. First of all, by allowing non-hormone-deficient children to take hGH and by characterizing them with idiopathic short stature, society is accepting the mindset that shortness is a sickness. Instead of establishing shortness as a normal condition many individuals share, it is distinguished as a problematic medical concern that needs to be cured.

There are two ways to approach the social problem of shortness. One can say that it is important for short individuals to change themselves so that they fit the norm, or that society change its perceptions of what is normal. As Dr. Ross Feldberg, assistant professor of biology at Tufts University, states, “Medicatizing this ‘problem’ transfers the responsibility for the discrimination away from those doing the discrimination and to the victims.”4

Another ethical concern involved with the use of hGH in non-hormone-deficient children is its effect on what is classified as “average” height. If “normal” children use hGH to increase their height, the average height will then become higher. Eventually, children who are not using hGH will become the new “abnormal.” Thus, instead of weakening the bias against short children, the widespread use of hGH could end up intensifying the bias against short individuals.

In addition, many are concerned that allowing “normal” individuals to take hGH will cause an increase in the gap between high and low
socioeconomic classes. Due to the fact that hGH is extremely expensive, the wealthy will be able to afford the hormone, whereas others will not. Thus, the wealthy, once again, will have an unfair advantage over the poor. They will benefit socially because of their taller stature, while the poor will be left to deal with their unavoidable shortness.

**THE BIOMEDICAL INDUSTRY'S ROLE IN THE USE OF hGH**

To fully understand the FDA's approval of hGH for non-hormone-deficient children, it is important to analyze the biomedical industry's gain with such a decision. According to Dr. Feldberg, there are about 400,000 non-hormone deficient children who will be eligible for the hGH treatment. He suggests that because the treatment will cost about $20,000 per child, a maximum of about 40,000 children will decide to take the treatment. Thus, the industry could potentially bring in about $800 million a year with the treatment of "normal" children alone. In the words of Dr. Feldberg, "Is it any surprise that the treatment was approved?"4

Another important question to ask is if the biomedical industry will regulate the use of hGH, given the potential profit they could gain. Although many manufacturers of hGH have stated that they will abide by regulations and only allow pediatric endocrinologists and certain pre-approved pharmacies to prescribe hGH, it is unlikely that the hormone will be so regulated. For example, soon after the drug Viagra was first approved by the FDA, it became the fastest-selling drug on the internet, frequently sold without a prescription. This phenomenon is already happening with hGH. Type "human growth hormone" into any search engine and you will find site after site selling the hormone on the internet. However, it is important to note that the websites selling the hormone offer only small amounts, which are unlikely to do harm or good. Nonetheless, it seems as if the regulation of hGH is already out of control.

**WILL USE OF hGH IN CHILDREN REALLY MAKE A DIFFERENCE?**

When debating whether to take human growth hormone, it is important to know whether being a few inches taller is really worth spending thousands of dollars and enduring years of both psychological and physical pain. In the end, will taking hGH really make a difference? Many believe that changing a child's height by even a few inches can greatly benefit them socially, which is more important than money or temporary pain. These children could potentially have fewer problems with their peers in school and would be able to focus more on their classwork. In addition, it is possible that they would be more self-confident and less aggressive due to the decrease in pressure these children feel to fit in.

On the other hand, according to David Sandberg, an associate professor of psychiatry and pediatrics at the University of Buffalo, taking hGH does not change children's lives in the end. Sandberg suggests that even though short children are often teased and treated as if they were younger than they actually are, it is unlikely that increasing their height by a few inches will make much of a difference in their lives because "our lives are so much more complicated than one single factor." He states that anyone who believes that growing a few inches will change a child's life around is a victim of simplistic thinking.3

Although many agree that the social benefits that come from taking hGH are remarkable, the potential risks "normal" children using hGH face are serious. Even more importantly, it is necessary that our society rid itself of the idea that shortness is a sickness. People should learn to be happy with who they are and not feel that they have to fit a social norm. In the words of Miriam Schulman, director of external communications for the Markkula Center for Applied Ethics:

We should approach enhancement as we would any other technology that reduces biodiversity. There's inherent good in pre-
serving differences among people, just as there is in preserving differences among species. When we set up a particular constellation of characteristics as normative and try to medicate everyone into conformity with them, who knows what we will lose—in the strength of character people develop as they cope with their differences, in the perspectives they bring to our common problems, in the advantages they may offer, which we, with our puny knowledge of human biological complexity, can not yet begin to fathom.5

Looking back at my friend John, it is incredible to see how his childhood experiences turned him into the proud, self-assured man he is today. When talking to John about his life as a short child, he defined his shortness as a characteristic that helped him overcome adversity. He states that because individuals often overlooked him because of his height, he had to learn to use his intelligence to keep people’s attention. His shortness not only helped him understand that everyone is different in their own way, but it also taught him that being different is not a bad thing. He realized that no matter what people say, in the end, it is really what is in the inside that counts.

SOURCES