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'Anti-aging' Growth Hormone May Shorten (Not Lengthen) Life

Thomas S. May, Medical Writer



Introduction

Believers in "anti-aging medicine" often suggest taking growth hormone (GH) as a relatively easy way to preserve your health and slow down aging.

What they usually don't mention, though, is that taking growth hormone can have serious side effects, including an increased risk of developing cancer. There is also some preliminary evidence that--instead of stopping or slowing down the aging process--growth hormone may actually speed it up.

"In humans, growth hormone levels go down as a function of age, so as we get older we have lower levels of growth hormones," says John Kopchick, PhD, a professor of molecular biology at Ohio University. "The idea behind using GH as an anti-aging drug is to try to bring back growth hormone levels to the levels they were at when we were young," he explains.

"In humans, growth hormone levels go down as a function of age, so as we get older we have lower levels of growth hormones."

Although growth hormone replacement has some favorable effects in patients with a severe deficiency of the hormone, the treatment isn't justified for reduced hormone levels that result from normal aging, according to Kopchick. "One has to be very careful if one wants to give growth hormone to normal individuals," he says, "because too much GH can cause serious problems with the heart, kidneys, and some other organs."

Growth hormone also stimulates the liver to increase the production of insulin-like growth factor-1 (IGF-1), and elevated IGF-1 levels are "strongly associated with excess risks of colon, prostate, and breast cancers," warns Samuel Epstein, MD, a professor of environmental medicine at the University of Illinois School of Public Health.

More Hormone, Shorter Life

Besides causing various medical problems, large amounts of growth hormone can speed up aging, according to the results of some experiments performed on laboratory mice. Lowering growth hormone, however, appears to slow down the aging process.

"We have animals that lack growth hormone activity, and they live 40 to 50% longer than normal," Kopchick says. "So you can take growth hormone away, at least in mice, and those animals will be just fine."

A recent review of the literature on the effects of growth hormone on aging has also found that less hormone (or less of its receptors) usually results in longer life while lots of it appears to have the opposite effect.

"The absence of GH signaling in mice significantly increases life span," according to Andrzej Bartke, PhD, chair of the Department of Physiology at Southern Illinois University (SIU) School of Medicine, the review's lead author. At the same time, "there is plenty of evidence from humans and animals that abnormally high GH levels can decrease life expectancy," Bartke says.

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Not only does it appear to accelerate aging, but there is also evidence that too much of it can contribute to the development of certain metabolic disorders, Bartke points out. "These include insulin resistance and probably also diabetes," he says. "So treatment with GH can produce side effects that can drastically shorten life span."

One clear example of the negative effects of having too much GH can be seen in people with acromegaly--abnormally high levels of the hormone. Acromegaly causes excessive growth of bones and internal organs, and it is also associated with an increased risk of cancer and a shorter life.

No Fountain of Youth

Karlis Ullis, MD is a California physician who has been practicing anti-aging medicine for over 10 years, and he is aware of some of the dangers linked to having too much growth hormone.

He claims, however, that the risks can be managed by giving relatively low doses and carefully monitoring blood levels.

"In order to achieve anti-aging effects--like fat loss, increased muscle mass, and improved energy levels--GH has to be monitored carefully, and it has to be given in low doses for 12 to 18 months," Ullis says. He cautions that the doctor must also look out for potential adverse effects like insulin-glucose imbalances.

Bartke agrees that growth hormone treatment potentially can change body composition "toward values typical for a younger person"--for example, reduced body fat and increased muscle mass. He adds, however, that there are too many risks involved in giving the hormone to people who do not have a deficiency.

One expert says there are too many risks involved in giving the hormone to people who do not have a deficiency.

"Most people working in this field believe that there is not enough data to thoroughly evaluate its safety," Bartke says. "A reasonable assumption would be that low doses may be safe and excessive doses may be dangerous. But it is unclear if doses can be found that would reliably produce the desired effects without significant risks."

Some other experts are even more skeptical. According to Jens Otto Jorgensen, MD, an endocrinologist with Aarhus Community Hospital in Denmark, for example, the experimental data aren't convincing. "GH in [those without growth hormone deficiency] does not improve physical performance or quality of life," he says. "Moreover, there is indirect evidence to suggest that sustained exposure to GH may increase the risk for developing certain malignancies."

Growth hormone shouldn't be used as an "anti-aging elixir," Jorgensen argues. "It is simply undocumented, expensive, and potentially harmful. My personal belief is that GH is not--and will never be--a fountain of youth. Aging is not just a deficiency of one or more hormones or growth factors."

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