

Human growth hormone: Not a life extender after all?

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People profoundly deficient in human growth hormone (HGH) due to a genetic mutation appear to live just as long as people who make normal amounts of the hormone, a new study shows. The findings suggest that HGH may not be the "fountain of youth" that some researchers have suggested.

"Without HGH, these people still live long, healthy lives, and our results don't seem to support the notion that lack of HGH slows or accelerates the aging process," says Roberto Salvatori, M.D., associate professor in the Department of Endocrinology at the Johns Hopkins University School of Medicine.

The researchers, working with an unusual population of dwarves residing in Itabaianinha county, a rural area in the northeastern Brazilian state of Sergipe, and led by Salvatori, sought to sort out conflicting results of previous studies on the effects of HGH on human aging.

Some studies have suggested that mice whose bodies don't efficiently produce or process the mouse equivalent to HGH have an extended lifespan. Other research has shown that people with low levels of HGH due to surgical or [radiation damage](#) to the [pituitary gland](#) that makes HGH have increased risk of [cardiovascular disease](#), a factor that can shorten life span. These patients also have decreased levels of other important hormones that the pituitary produces, possibly confounding results.

Complicating the picture, in recent years, HGH has been widely touted — especially on Internet sites — as an anti-aging marvel. Advertising pitches often base the claim on observations that among those with an HGH deficiency, HGH supplements can reduce some physical signs of aging such as thinning skin and reduced [muscle mass](#).

In an attempt to resolve the research discrepancies about HGH's anti-aging value, Salvatori and his colleagues studied 65 of the Brazilian dwarves. Each member of this group has two mutant copies of a gene responsible for releasing HGH, leading to a severe congenital HGH deficiency. All of the study subjects have unmistakable characteristics of the deficiency: very short stature, childlike facial appearance, and high-pitched voices.

After genetic tests confirmed the presence of the mutation, the researchers collected birth dates and, for those deceased, death dates for the dwarves and their 128 unaffected siblings among 34 families. They compared these life spans with each other, as well as with the death rate in the general local population.

Salvatori, who has turned to this population for numerous studies of pituitary function and HGH, and his colleagues found that those deficient in HGH lived just as long as their unaffected siblings. Compared to the general population, those deficient in HGH had a slightly shorter lifespan, based solely on higher death rates in five females under age 20. When this subgroup was excluded from the analysis, average lifespan among the dwarves and the general population was identical.

The researchers aren't sure why this subgroup had a shorter lifespan, but speculate that lower [growth hormone](#) levels may affect the immune system's ability to fight off sometimes deadly infections. Of the five, four were known to have died from diarrheal disease, Salvatori explains.

Why this factor affected only females is unknown.

To learn whether having a single copy of the mutant gene might affect lifespan, the researchers recruited volunteers from the Itabaianinha polling place on election day (voting in Brazil is mandatory). Since those with a single copy of the affected gene are of normal stature, the researchers determined which volunteers had this quality by genetically testing volunteers' saliva samples. When the researchers compared numbers of young people (ages 20 to 40) and older people (ages 60 to 80) bearing a single copy of the abnormal gene, the figures were nearly identical, suggesting that being "heterozygous" for this gene does not affect life span, either.

Overall, these findings, published in the January issue of the *Journal of Clinical Endocrinology and Metabolism*, suggest that levels of HGH don't affect lifespan positively or negatively, says Salvatori.

Provided by Johns Hopkins Medical Institutions

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