

Medicine by John Grauerholz, M.D.

Growth hormone a source of hope

Synthetic human growth hormone bears great promise for our elderly, but a growing black market is a threat.

A study in the July 5, 1990 issue of the *New England Journal of Medicine* reports that synthetic human growth hormone can reverse some changes of aging. In a group of twelve men, from 61 to 81 years of age, injections of the hormone produced an 8.8% increase in lean tissue and a 14.4% decrease in fat tissue over a six-month period. The skin and the spinal bones became thicker, but the changes were less striking. A control group of nine men of similar ages showed no changes over the same time period.

Researchers from the Medical College of Wisconsin in Milwaukee, the Chicago Medical School, the University of Illinois School of Public Health, and the Argonne National Laboratory, Argonne, Illinois conducted the study. They knew that growth hormone secretion declined in older people, with loss of lean tissue and increase of fat tissue. In mice, children, and younger adults with growth hormone deficiency these changes are reversed by administering synthetic growth hormone. The question was: Would aged adults with decreased growth hormone secretion also respond to administration of the synthetic hormone? The answer is yes.

This confirms research reported in this column in 1988 on the use of human growth hormone in the treatment of Alzheimer's disease. Dr. Chaovanee Aroonsakul, a neurogerontologist then based in Chicago, pioneered the use of the same synthetic human growth hormone in combination with other growth factors to arrest and reverse the mental deterioration of senile dementia and Alzheimer's dis-

ease. Dr. Aroonsakul saw the same changes in patients she was treating for dementia as side benefits, as those that the *New England Journal of Medicine* article reported. She discussed her approach in more detail in an interview in the September-October 1988 issue of *21st Century Science & Technology* magazine. She was then working with the late physicist Dr. Robert Moon, and some of his colleagues at Argonne. It may not be coincidence that Argonne is also involved in the more limited study reported last month.

Dr. Aroonsakul developed a test to differentiate Alzheimer's disease from simple senile dementia. This test measured the secretion of growth hormone in response to a dose of the drug, L-dopa. L-dopa stimulates the secretion of growth hormone by the pituitary gland. Normal people show a sharp rise in growth hormone levels when given L-dopa, while those with true Alzheimer's disease show no response and people with simple senile dementia show a reduced response.

Her initial studies showed actual reversal of Alzheimer's disease symptoms in her patients, something which had not been seen previously. She also saw reversal of other aging-related changes similar to those reported. Her results were greeted with much skepticism, and she ran into resistance from other physicians and from the drug company supplying the synthetic human growth hormone.

Those treated in the current study were patients with low levels of growth hormone. The doses given raised their levels into the normal range and not above it. Thus they were

similar to Dr. Aroonsakul's patients, although they did not show signs of dementia. The doses were carefully calculated to raise their levels into a normal range, because elevated levels of growth hormone cause hypertension, diabetes, and a condition known as acromegaly. The people who received growth hormone in the current study did show mild elevation of blood pressure and fasting blood sugar, but none developed diabetes.

On the negative side, these results may fuel an already existing black market in synthetic human growth hormone among weightlifters and bodybuilders searching for an alternative to anabolic steroids. A 1989 General Accounting Office report to the Senate Judiciary Committee documents such a black market, mostly in anabolic steroids with a small, but growing, trade in human growth hormone. Much of what is alleged to be growth hormone is bogus, but some of it is real. One reason for the small amount of the real hormone on the black market is the strict control on distribution by the pharmaceutical companies, which is effective, since its production is highly sophisticated.

There is good evidence that appropriate doses of synthetic human growth hormone can reverse certain changes of aging. In combination with other growth factors it can reverse Alzheimer's disease and senile dementia. In excessive doses it can cause life-shortening side effects.

Whether synthetic human growth hormone becomes part of a rational therapy for reversing the aging process, and potentially prolonging human life, depends on whether there is a commitment to do so. The current mania for reducing population growth argues against such a commitment. Without it, human growth hormone will become just another dangerous drug on the American flea market.