

Heightened Concern Over Growth Hormone

Parents should think twice before giving growth-enhancing hormones to short but healthy children, British researchers advise. A new study indicates that supplementary doses of human growth hormone can trigger worrisome metabolic and physical changes when injected into youngsters who don't lack the hormone. The researchers also express concern that subtler abnormalities in organs or cells may accompany the more obvious changes in physique.

"The point is, human growth hormone is not just a growth hormone. It's got a lot of other metabolic effects," says David B. Allen, a pediatric endocrinologist at the University of Wisconsin-Madison. Despite parental clamoring for a magic bullet to enhance children's height, "use of growth hormone should be directed towards extremely short kids severely handicapped by height," Allen says.

In 1985, the United States and England approved the use of recombinant human growth hormone — a genetically engineered version of a compound normally produced in the body — for children suffering from dwarfism, whose pituitary glands fail to make the hormone. More recently, researchers have begun to investigate the drug's potential for short children not lacking the hormone.

A handful of studies have shown that growth hormone can indeed accelerate growth in medically normal, short children, although it remains unclear whether the treatment really leads to taller adult heights or simply speeds an individual's attainment of the height he or she would reach anyway. But until now, no study had focused on the drug's metabolic and physical side effects, says Joanna M. Walker of the Addenbrook's Hospital in Cambridge, England.

Over a one-year period, she and her colleagues from Southampton University measured growth and metabolic rates, body fat levels and lean body mass of 37 children, 18 of whom received daily injections of recombinant human growth hormone. The kids, ages 6 to 8, were clinically normal but were among the shortest 3 percent for their age.

The treated group gained height significantly faster, outpacing the untreated group by an average of more than 1.5 inches per year. But while untreated kids added both muscle mass and body fat as they grew, the treated group gained much larger amounts of muscle and lost as much as 76 percent their body fat. These striking losses of fat, mostly from the limbs and face, created obvious alterations in the children's physiques, with the girls especially looking "inappropriately muscular," the researchers report in the Dec. 1 LANCET.

The outward changes are not subtle, Walker says. "These people walk in the door and you think, 'My goodness.'"

Walker stresses that the findings provide no clear evidence that the changes pose a health hazard. And in the absence of such evidence, she says, the researchers plan to continue the study for another 10 years. But she and her colleagues wonder whether the profound changes in body composition — which are accompanied by significant changes in some metabolic measures — may reflect changes in the visceral organs and in individual cells.

"The possibility that [the drug] produces profound metabolic effects should limit its use in otherwise healthy children until the mechanism of action is more clearly elucidated," they conclude.

Scientists conducting a similar study in the United States have not seen such extreme effects but haven't specifically looked for them, says endocrinologist Gordon Cutler of the National Institute of Child Health and Human Development in Bethesda, Md. "Because of the logistics of bringing people in every six months from all over the country, interrupting school and so on, we have not done this kind of analysis," he told SCIENCE NEWS.

Cutler, Walker and others say the British study raises concerns about the potentially large number of parents who administer the drug to their medically normal but short children without close monitoring by physicians.

"People don't want to enter [their children] into clinical trials because they're afraid they'll get the placebo instead of the drug," Cutler says. "They're saying: 'I want my child to grow; just give it to me.'"

— R. Weiss

Astro finally eyes X-ray and UV universe

After nearly two days of delays in orbit caused by technical problems that robbed the Astro Observatory of at least 10 percent of its viewing targets, the shuttle-borne astronomical probe began feasting its "eyes" on a host of galaxies, supernovas and ultrahot stars glowing with X-rays and ultraviolet light undetectable by ground-based telescopes.

"It's like walking into a smorgasbord," said mission scientist Ted Gull on Dec. 4. "Our plate is there and we'd like to fill it quite full."

The shuttle Columbia lifted off with Astro in its cargo bay early on the morning of Dec. 2, setting out for a 10-day journey through space. Originally scheduled to fly in February 1986 — a month after the Challenger accident — Astro has failed to achieve launch in four attempts since last May.

The observatory features two ultraviolet spectrographs, an ultraviolet camera and a broad-band X-ray telescope. Among its first accomplishments:

- The highest-resolution ultraviolet spectrum ever obtained of Earth's uppermost atmosphere, which extends beyond Columbia's orbit. Researchers must correct for this atmospheric "airglow" in order to interpret Astro's measurements of ultraviolet emissions from distant stars and galaxies.

- A short-exposure spectrum in the ultraviolet, which includes previously undetected wavelengths below 1,200 angstroms emitted by a Seyfert Type I galaxy called NGC4151, whose spiral arms spew intense radiation as the galactic center sucks in matter. Such spectra may help

reveal whether a black hole lurks at the galaxy's core.

- A preliminary X-ray spectrum of the bright binary star Capella, showing emission lines from ionized iron and silicon. The emissions' relative intensities provide clues to how fast this Milky Way member burns its nuclear fuel.

These successes notwithstanding, the mission's early days were severely hampered by problems with one of the shuttle's two computer keyboards, the X-ray telescope's automated pointing system, and the automated pointing system for the three ultraviolet instruments. The pointer setbacks prevented observations of at least 25 of the 250 planned viewing targets, says Gull.

On Dec. 4, software specialists finished repairing the pointing system for the X-ray telescope. Several other software adjustments had improved the alignment of the three computer-guided pointers for the ultraviolet instruments and had reduced one pointer's excessive light sensitivity, helping the ultraviolet trio to lock onto astronomical objects in unison.

The shuttle astronauts must still resort occasionally to the time-consuming task of using a "joystick" and TV images — much like a video game — to help the ultraviolet instruments' automatic and manual pointers keep target objects in view.

With the malfunctioning keyboard down for the duration, the shuttle crew has had to operate both Astro and Columbia with a single keyboard, further reducing observing time, says mission manager Jack Jones.

— R. Cowen