

Natural hormones: Longevity drugs of the future

Our hormones play a major role in how fast we age. The action of the glands is complex. In part, they act in synch to advance the life cycle according to biological plan. Alternatively, they may go haywire, promoting disease states associated with the aging process.

Since hormones influence the pace of aging, considerable research is underway to evaluate the feasibility of “replacement therapy” to forestall degenerative changes. Menopausal treatment with estrogen and progesterone is now advocated by many gynecologists, but the story doesn’t end here. The uses of testosterone, the adrenal hormones like DHEA, growth hormone, and melatonin are now being investigated, too.

The sex hormones, which are deliberately programmed for decline, are obvious targets for intervention. In women, menopause is distinct. In men, the “andropause” is less clearly demarcated, perhaps masking testosterone’s importance. The adrenal androgens, too, best exemplified by DHEA, may pace aging in both sexes through a change of life, newly dubbed “adrenopause” by hormone researchers.

Other hormones such as insulin and thyroid don’t always change with age. Insulin and thyroid hormones may go up, stay the same, or go down. Perhaps least understood are pituitary growth hormone and melatonin, endocrine factors whose production tapers markedly with age. The feasibility of using these hormones is only just now being explored.

Estrogen and progesterone

Hormone replacement therapy with estrogen and progesterone is widely advocated to prevent osteoporosis and cardiovascular disease. A recent study suggests that the use of progesterone enhances the cardiovascular benefits of estrogen. These include increased production of HDL, the “good-guy” cholesterol. Some research even substantiates a direct antioxidant effect of estrogen.

The benefits of estrogen in relieving menopausal complaints, enhancing mood, libido and memory, and even forestalling Alzheimer’s have been described. While the majority of women do not, in my opinion, require hormone therapy with estrogen, the value of its companion hormone, progesterone, may be underestimated.

Natural progesterone, too, (but not artificial drugs like Provera) may provide their own cardiovascular benefits. Natural progesterone, in addition to enhancing fat breakdown and preventing blood clots, counteracts carbohydrate craving that may promote obesity and cardiovascular risk. In addition, progesterone can relieve menopausal symptoms such as hot flashes, reverse osteoporosis, and enhance mood and libido. Natural progesterone can be prescribed in oral capsules or it can be applied to the skin. The latter form is available over the counter as wild yam extract in health food stores and nutritional pharmacies.

Testosterone

Much has been said of testosterone’s youth-perpetuating effects. It is the chief hormone of libido in both sexes, and libido is popularly identified with youthful vigor. But testosterone may exert an even more far-reaching spectrum of antiaging effects.

Studies reveal that low testosterone is associated with accumulation of mid-abdominal fat, a hallmark of cardiovascular risk. Cardiologists in Denmark urge testosterone replacement in diabetes, heart disease and circulatory problems in both men and women. Surprisingly, in view of the male predominance of cardiovascular disease, evidence favors a heart-protective effect of testosterone. It activates cholesterol elimination, prevents blood clots, improves pumping action of the heart, and favors energy production in blood-starved tissue through its promotion of ATP activity. No wonder Danish physicians have documented the reversal of foot gangrene and angina with the use of testosterone.

Testosterone enhances other parameters of human aging by retarding age-related loss of skeletal muscle, reversing insomnia, depression, and fatigue, and conferring protection against auto-immune such as like rheumatoid arthritis and lupus, found to occur with greater frequency in women. Testosterone also is a cardinal hormone for preventing osteoporosis.

Adrenal hormones

The adrenal is a complex endocrine organ whose activity impacts aging in a variety of ways. First, it is thought by some scientists that stress-induced chronic elevations of adrenaline promote heart disease, high blood pressure and even immune system damage. At the same time the adrenals become stressed, midlife levels of the adrenal androgens, best exemplified by DHEA, begin their downward cascade to eventually reach 5 percent of their peak values at age 20.

DHEA works mostly by slowing an inefficient pathway of energy production in the body. Research has shown up to a 25 percent lifespan extension with addition of DHEA to animal chow.

DHEA is being explored in relation to autoimmune conditions, heart disease, diabetes and obesity. Its anabolic and immune-enhancing effects have led to its use as an adjunctive treatment in AIDS and for helping weak and elderly patients respond better to vaccines. Its preventive effects extend to many forms of cancer. Patients with chronic fatigue syndrome are known to benefit from DHEA. Blood tests can diagnose inadequate levels, and supplementation can be prescribed by a knowledgeable physician.

Thyroid

Thyroid function runs an unpredictable course with aging. Production of thyroid hormone may soar, remain steady or decline inexorably. More perplexingly, tissue resistance to thyroid hormone may emerge with illness or advanced years, resulting in de facto hypothyroidism despite normal test results.

Morning underarm temperature is believed by some to be a gauge of thyroid adequacy. Thyroid hormone preserves youthfulness in several ways. Enhanced thermogenesis offsets fat accumulation and improves lipid profiles. Mood, libido, hair, skin and nails are enhanced. But excess thyroid supplementation or hyperthyroidism are associated with increased risk of osteoporosis and dangerous heart palpitations.

Insulin

Insulin has emerged in recent years not merely as a regulator of sugar metabolism, but also as the villain responsible for a process that may be central to aging: "syndrome X." A term coined by Dr. Gerald Reaven and associates at Stanford University, syndrome X is a triad of consequences of insulin overproduction:

- Elevated cholesterol and triglycerides
- High blood pressure
- Borderline diabetes

The hallmark of syndrome X is abdominal fat, which insulin overproduction accentuates. Syndrome X patients, therefore, go on to develop premature heart disease. On the way to a first heart attack, they may complain of feeling "tired all the time."

In addition, insulin may impair immunity and promote osteoarthritis. High levels of insulin may play a role in glaucoma, a frequent accompaniment of hypertension and diabetes.

Prevention or reversal of syndrome X is achieved with lifestyle modification, aerobic exercise and a low carbohydrate ("Salad and Salmon") diet as their cornerstones. Helpful nutrients include chromium, vanadium, magnesium, vitamin E and the omega-3 essential fatty acids. DHEA has also been shown to reduce obesity and curb diabetes in rats. An anti-diabetes drug called metformin, long used in Europe, will soon be available in the U.S. to curb syndrome X when natural agents don't suffice.

Growth hormone

Despite the dangers of pituitary growth hormone, its age-related decline has made it another appealing candidate for use in antiaging therapies. Research has explored the role of growth hormone replacement in humans to slow age-related deterioration of muscle mass and strength. Impressive improvements in fat-to-lean ratio and muscle strength were documented.

Growth hormone also plays a role in wound healing and immune surveillance. Its use has been proposed to prevent or reverse AIDS-related wasting syndrome.

The rejuvenating and invigorating reputation enjoyed by growth hormone has prompted well-publicized abuse, chiefly among athletes. But one has only to recall a rare disease called acromegaly to recognize the perils of injudicious growth hormone self-administration. Acromegaly is a condition of growth hormone over-production. Facial deformity, swelling of feet and hands, arthritic complaints and excess body hair characterize acromegaly. The osteoporosis and diabetes growth hormone excess frequently engenders are an even greater threat to longevity. Moreover, growth hormones may even stimulate the growth of certain cancers. Growth hormone remains illegal in the U.S. except in the treatment of growth failure in children of short stature. Enthusiasts must now go to Mexico for expensive rejuvenation regimes.

Melatonin

Estrogen and testosterone can be thought of respectively as the Venus and Mars of longevity hormones, melatonin is its Pluto. Mysterious and at home in darkness, melatonin is the unique product of the pineal gland located deep within the brain. It seems to operate independently of the complex orchestration that links the activity of the other hormones of the endocrine system. Its cue is the daily cyclic variation in light. While previous research has focused almost exclusively on melatonin's role in pacing the body's day/night rhythms, new findings suggest it may exert potent anti-aging effects.

Melatonin production declines steadily with age, undermining sleep patterns in the elderly. Since the rest provided by sleep may support regenerative processes,

melatonin may thus indirectly retard aging.

But additional direct antiaging effects of melatonin are becoming recognized. Melatonin functions as a premiere antioxidant, retarding DNA damage experimentally induced by exposure to carcinogens and radiation. It may act to counter degenerative changes in the brain, reverse certain forms of depression or schizophrenia, and retard accelerated aging such as that which occurs in Down syndrome (a model for Alzheimer's disease). Further research will attempt to better clarify the role of melatonin, explore its safety, and define strategies for its use. Meanwhile, a profusion of melatonin products are being introduced in health food stores, perhaps prematurely.

The therapeutic window

The importance of a variety of hormones in slowing aging has only recently been recognized. The challenge is to understand their complex interplay and determine the therapeutic window for intervention that is both effective and non-hazardous.