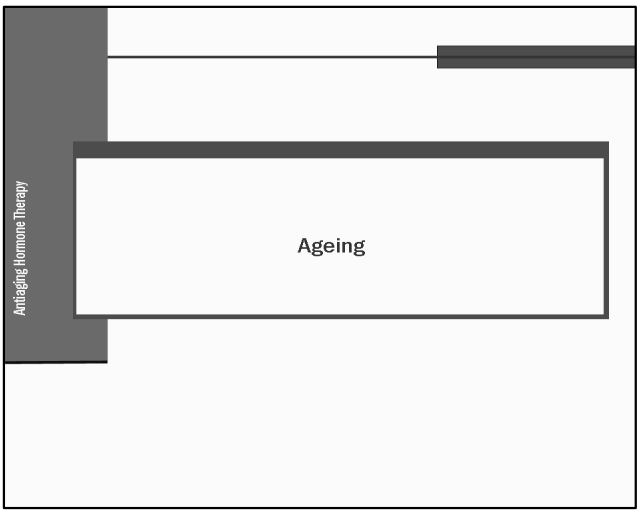
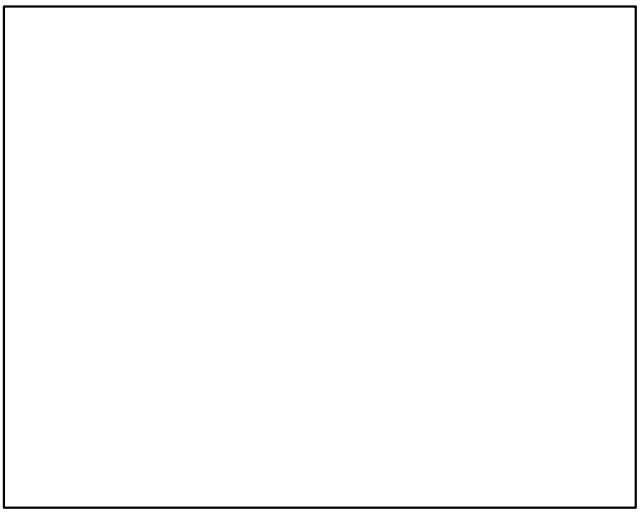
[연수강좌]

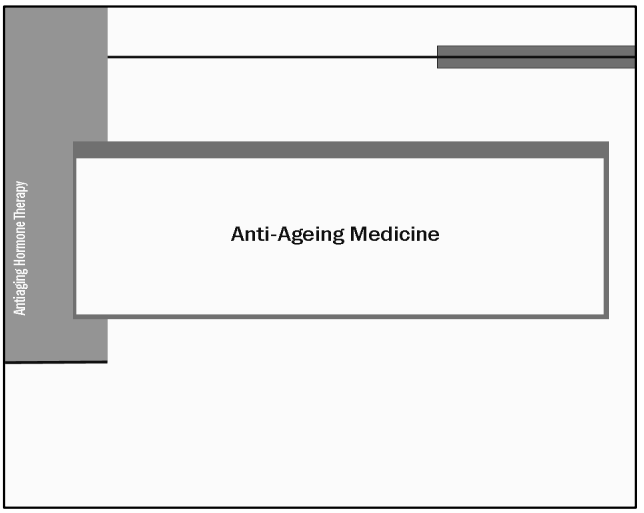
노화방지를 위한 호르몬 치료

김 성 운

경희의대

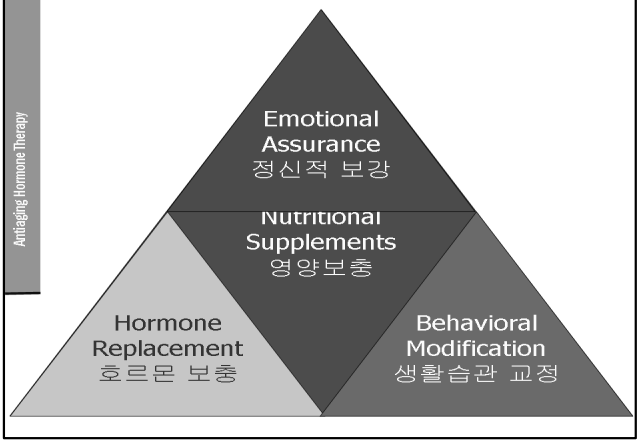






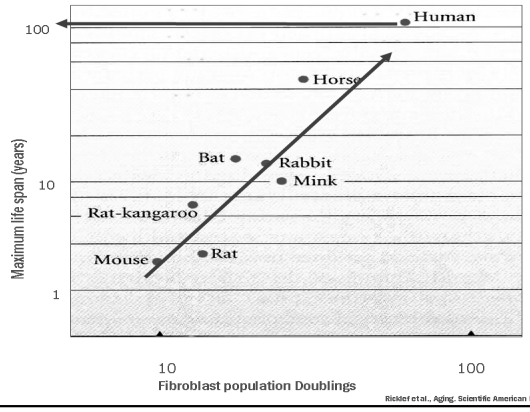
Antiaging Hormone Therapy

Component of Successful Ageing



Antiaging Hormone Therapy

LIFE SPAN (수명)



Riddef et al., Aging, Scientific American Library

Hormone Therapy

Antiaging Hormone Therapy

Structures of Telomere

- The telomeres of most organisms' chromosomes consist of short sequence-asymmetric repeated sequences.
- Lengths are typically greater than 50 repeats in holotrichous ciliates, less than 350 repeats in Arabidopsis and 300 to 500 bp in Saccharomyces.

Tetrahymena, Paramecium	CCCCAA
Oxytricha, Euplotes	CCCCAAAA
Trypanosoma, Leishmania	CCCTA
Physarum	CCCTA
Saccharomyces	$C_{1\text{-}3}A$
Arabidopsis	CCCTAAA
Homo	CCCTAAA
Caenorhabditis	CCCTAAA

Antiaging Hormone Therapy

Characteristics of Ageing in Human

Antiaging Hormone Therapy

How Age Can Change a Man's Body

The term "male menopause" drives medical experts crazy. In women, "menopause is a clearly defined biological event," says Dr. Abraham Morgenthaler of Boston's Beth Israel Hospital.

"There is no equivalent for men." True enough, but middle age does bring changes, and few of them would qualify as improvements. Here's a rundown of the main ones:

Brain function Concentration and language skills don't change much with age. The ability to store and retrieve information declines slightly but steadily from the 20s on.

Vision By age 50, lifelong thickening of the lens causes a noticeable loss of night vision and close-in focus.

Heart response After 20, the heart becomes less adept at accelerating in response to exertion. Bars show maximum rate in beats per minute:

200 190 180 170 160 150

Age 20 30 40 50 60 70

Aerobic endurance As the body's ability to deliver oxygen declines, the capacity for physical work falls. The work capacity of a 70-year-old is only half that of a 30-year-old.

Body fat Between the ages of 25 and 75 the amount of fat in proportion to the body's composition doubles. Much of that growth occurs in muscles and organs.

Angle of erection Many men experience a slight loss of upward mobility from 30 to 50, and a major loss from 50 to 70. Preventable vascular disease is largely to blame.

ERECTION DEGREES ABOVE HORIZONTAL

Age 30: 70°
Age 40: 57°
Age 50: 47°
Age 70: 25°

Hair loss The number of hair follicles on the scalp decreases as men age, and the hair that is left grows at a slower rate.

Hearing Eardrums thicken and the ear canal atrophies, making pure tones and high frequencies harder to hear, especially the late 50s.

Lung power Chest wall stiffens, increasing the workload of respiratory muscles. More residual air is left in lungs after each breath.

Frequency of sex Decline in sex drive varies from man to man, but some reduction is inevitable due to lower levels of sex hormones and loss of vitality. Orgasms per year:

121 104 84 52 35 22

Age 20 30 40 50 60 70

Muscle and bone Eventually muscles get smaller and weaker, but those changes can be offset by exercise. Bone loss, a universal aging trait, occurs at individual rates.

SOURCE: THE AMERICAN GERIATRICS SOCIETY

Antiaging Hormone Therapy

LIFESTYLE

Testosterone and other hormone treatments offer

Attention: Aging Men

By Geoffrey Cowley

FIVE YEARS AGO, ON THE EVE OF HIS 50th birthday, Ron Fortner realized that time was catching up with him. Like countless men his age, the Palm Springs, Calif., radio personality had drifted away from exercise, but not from stressful days or fatty meals. His belly was soft, his energy and libido were lagging and his coronary arteries were ominously gummed up. After his advancing heart disease forced him into a quintuple bypass operation, Fortner decided he wasn't ready to get old. He hooked up with Dr. Edmund Chein of the Palm Springs Life Extension Institute and embarked on a hormone-based regimen designed to restore his youthful vigor.

In 1994, following Chein's advice, he started injecting himself with human growth hormone, the substance that drives bone and muscle development

That Sinking Feeling

Hair isn't the only thing that falls with age; the hormones plentiful in youth also drop.

PERCENTAGE OF PRODUCTION TO MEN

100% 75 50 25 0

Testosterone

DHEAS*

25-34 35-44 45-54 55-64 65-74 75-84 85-100

Antiaging Hormone Therapy

Medical Evidence of Anti-Ageing

Antiaging Hormone Therapy

Calorie restriction in mouse (절식)

100
80
60

Calorically restricted

Allowed to feed

rival (%)

Antiaging Hormone Therapy

Effects of GH and/or Sex Steroid Administration on Abdominal Subcutaneous and Visceral Fat in Healthy Aged Women and Men

The study used a randomized, double-masked, placebo-controlled, double-dummy, noncross-over 2 x 2 factorial design for a total period of 26 wk.

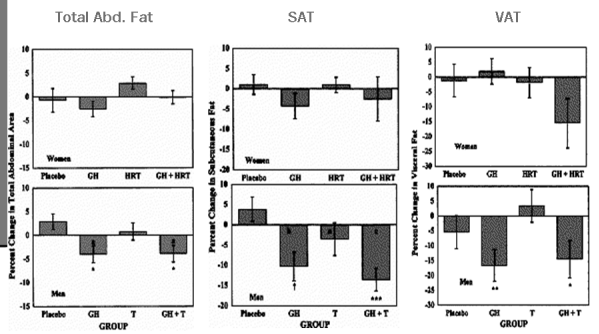
- GH + sex steroid placebo
- sex steroid + GH placebo
- GH + sex steroid
- GH placebo + sex steroid placebo.

- Recombinant human GH (Nutropin, Genentech, Inc., South San Francisco, CA) 20 μg (0.055 U)/kg BW, self-injected sc, 3 times/wk, in the afternoon. assessing effects of GH in healthy aged men (30 μg= 0.0825 U/kg).
- HRT was given as 100 μg/d E2 patch (Estraderm, Novartis Pharmaceuticals, East Hanover, NJ) + 2.5 mg medroxyprogesterone acetate (Provera, Pharmacia & Upjohn, Inc., Kalamazoo, MI) for the first 10 d of each month.
- T was administered as im injections of 100 mg T enanthate (TE) (Delatestryl Injection, Bio-Technology General Corp., Iselin, NJ) every 2 wk.

JCEM 86:3604-3610, 2001

Antiaging Hormone Therapy

GH, T & E2



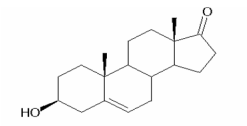
JCEM 86:3604-3610, 2001

Antiaging Hormone Therapy

GH & DHEA replacement

Oral dehydroepiandrosterone (DHEA) supplementation modulates spontaneous and growth hormone-releasing hormone (GHRH) induced growth hormone (GH) and insulin-like growth factor-1 (IGF-I) secretion in early and late postmenopausal women

FERTILITY AND STERILITY *76:241-248, 2001*



Antiaging Hormone Therapy

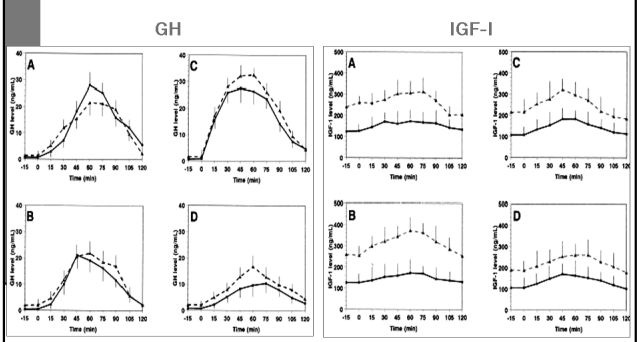
Oral DHEA supplementation modulates spontaneous and GHRH induced GH and IGF-I secretion in early and late postmenopausal women.

FERTILITY AND STERILITY *76:241-248, 2001*

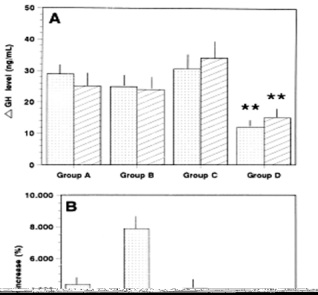
Daily oral DHEA 50 mg for 6 months.

- Group A: 9 women, aged 50 to 55 years, BMI = 20 to 24
- Group B: 9 women, aged 50 to 55 years, BMI = 25 to 30
- Group C: 7 women, aged 60 to 65 years, BMI = 20 to 24
- Group D: 6 women, aged 60 to 65 years, BMI = 25 to 30

GH & DHEA replacement



Antiaging Hormone Therapy

Oral DHEA supplementation modulates spontaneous and GHRH induced GH and IGF-I secretion in early and late postmenopausal women.

- GH response to GH-RH expressed as mean D in Group A (lean postmenopausal women), Group B (obese postmenopausal women), Group C (lean, late postmenopausal women), and Group D (obese, late postmenopausal women). (**A**), Baseline. (**B**), Mean percent variation. The different way of representing the response of GH might condition data interpretation even if it appears clear that aging and obesity induce a lower response of GH to GHRH (panels A to B).
- The dotted bar is before