

DHEA

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Last summer, the FDA lifted its 10 year ban on the over-the-counter sale of dehydroepiandrosterone (DHEA). DHEA is a hormone produced in the adrenal glands and was first recognized in 1934. It is used by the body as a precursor to testosterone, estrogen, corticosterone, and progesterone. In humans, DHEA production begins in the fetus. The DHEA interacts with the placenta, which stimulates estrogen production during pregnancy. Newborns and infants do not produce DHEA. Children begin producing this hormone around age seven. DHEA production reaches its peak between ages 20 and 30. Levels then slowly decline. By age 60 DHEA levels are significantly lower with reports varying from 5-30 percent of their peak levels in the third decade of life. In addition to its age-related decline, DHEA will temporarily decline at any age with excessive stress, infection, or illness. If the illness or infection is chronic, DHEA levels may remain low.

Commercial DHEA is produced from *dioscorea villosa*, a.k.a. wild yam or Mexican yam. It takes pounds of the raw material to yield grams of DHEA in a six to eight step chemical process. If you or your patient want DHEA, I recommend you buy pharmaceutical grade. Using yam or *dioscorea* extract, concentrate, powder, or tablets may give you some interesting phytochemicals, but it will not yield DHEA. The only studies I could find where patients raise their DHEA levels were on people who used the hormone and not a plant extract.

TABLE I

Low levels of DHEA are found in people with these conditions:

AIDS

Alzheimer's disease

anorexia nervosa

cancer (some types, e.g., breast)

Cushing's syndrome

depression

diabetes

heart disease

high cholesterol

hypertension

hypothyroidism

illness

infection

leukemia

lupus

obesity

old age

osteoporosis
rheumatoid arthritis
senility
stress

The list of conditions with low DHEA in Table I is impressive. It is too early to tell if normal DHEA levels would prevent any or all of these conditions, or if DHEA levels are low a person will contract one or more of these conditions. Most likely low DHEA levels will signify to the clinician that the patient is at a greater risk for one or more of these types of conditions, especially if there are exam or historical correlations.

Recent Studies

One of the most commonly quoted studies in the DHEA literature involved a 50 mg per day dose to men and women between ages 40 and 70 for three months compared to placebo. Over 80 percent of the men and two thirds of the women reported increased energy, better sleep, better moods and were more relaxed in stressful conditions.¹ Other small human studies showed enhancement of immune and cardiovascular systems along with an increase in bone density and muscle mass in older-aged individuals.² There are impressive animal studies on mice, one of which was performed on mice genetically bred to become obese, and another on mice who were genetically bred to develop breast cancer. Large doses of DHEA given to these rodents prevented these genetically predisposed conditions from occurring.^{2,3}

In a 1986 study that is also heavily quoted in the DHEA literature, 242 men ages 50-79 had their DHEA levels followed for 12 years. Those with 100 mcg/dl levels greater than age-matched counterparts had a 36 percent lower overall death rate and a 48 percent reduction in cardiovascular disease. The researchers concluded that DHEA may inhibit an enzyme essential to the production of fatty acids and cholesterol. However, in the same study women with higher levels of DHEA did not have a lower death rate or reduction in cardiovascular disease, and this part of the study was unfortunately ignored by proponents of DHEA. There have been other impressive studies on women with low levels of DHEA who had a higher incidence of breast cancer and osteoporosis.

Dosing

There is currently a wide variance in DHEA dosing. In studies of patients who have serious diseases, doses can be 200 mg per day or more.⁴ Weight-loss studies have given 1600 mg per day for six weeks. The half-life of DHEA is approximately 10 hours. Therefore, divided doses in the morning and night are best. Many doctors who advocate DHEA as a preventive supplement will base dosing on blood tests, supplementing those patients who have low blood levels of DHEA. The goal is to elevate blood levels to what people have in their 20s. I found a wide range of what is considered normal for 20-year-olds.

Acceptable normals vary from 200-400 mcg/dl in women, and 500-700 mcg/dl for men.⁵ Other clinicians recommend dosing to levels between 300 and 500 mcg/dl.⁶ Of course, the typical 50-year-old person who starts DHEA today probably has no idea what their individual DHEA level was 25 years ago. Other advocates figure that since the average person in their 20s produces 25 mg per day (30 for males and 20 for females), and that by age 80 production is reduced 95 percent in a linear fashion, simple mathematics would indicate that dosing for an 80-year-old man would be 30 mg per day with a

15 mg dose for a 50-year-old. Of course, whenever a clinician is trying to raise blood or intracellular levels of a given substance the amount given orally may not raise a person's levels in a linear fashion. The recommended doses from two noted doctors with newsletters are as follows: females 25 mg, males 50 mg,⁶ and females 5-50 mg and males 25-100 mg.⁷

Toxicity

There are no known toxic levels of DHEA; however, there may be some possible downsides. In a study quoted in the U.C. Berkeley Wellness Letter, January 1996, 90 percent of rats on DHEA developed liver cancer. This study was unreferenced. However, I am assuming the doses these rodents received were astronomical because the doses in the other two above-referenced rodent studies were very large and those mice did not develop liver cancer. Since DHEA can stimulate both the immune system and hormones such as testosterone and estrogen, it would be interesting to see if DHEA supplementation would be a benefit or detriment to men with prostate cancer and women with uterine or ovarian cancers. I would like to see those companies who are profiting from DHEA sales fund some studies in this area.

Finally, in another unreferenced statement from the Berkeley Wellness Letter, the editors stated DHEA could lower HDL cholesterol, cause unwanted hair growth, and increase insulin resistance.² This directly contradicts other authors who say DHEA reduces insulin resistance, increases insulin sensitivity, and lowers LDL and total cholesterol.⁶

Conclusion

DHEA supplementation for a variety of conditions is very promising. Any type of hormone therapy can yield a wide variety of physiologic changes. Although DHEA appears to be safe, I recommend clinicians proceed with caution and monitor their patients with appropriate laboratory and clinical observations. I hope interest in DHEA will generate greater research in therapeutic application. I will be watching the literature on DHEA closely and inform you of any significant information.

References

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