

October 30, 2007

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Life Extension Update Exclusive

DHEA helps prevent oxidative stress and AGE formation in diabetics

The November, 2007 issue of the American Diabetic Association journal *Diabetes Care* published a report describing the finding of Italian researchers that administering the hormone dehydroepiandrosterone (DHEA) to diabetics helps prevent oxidative stress and advanced glycation end product (AGE) formation. Advanced glycation end products are sugar-derived substances that cross-link with proteins, leading to tissue damage which can result in diabetic complications. Prevention of free radical formation by antioxidants has aided in counteracting AGE formation in laboratory studies. Free radicals may also be involved in the development of insulin resistance.

Professor Giuseppe Boccuzzi of the University of Turin and his associates matched twenty diabetics with twenty age and gender-matched nondiabetic subjects. Half of the diabetic participants were given 50 milligrams oral DHEA while the other half received a placebo for twelve weeks. Blood samples drawn upon enrollment and at the study's conclusion were tested for DHEA and DHEA sulfate, pentosidine (a marker of AGE biogenesis), tumor necrosis factor-alpha (TNF-alpha, involved in inflammation) and its soluble receptors; reduced glutathione (an antioxidant), reactive oxygen species, hydroxynonenal (HNE, a byproduct of lipid peroxidation), vitamin E, and other factors. Additionally, peripheral blood mononuclear cells were analyzed for oxidative parameters.

Oxidative stress, as indicated by high levels of reactive oxygen species and HNE, and low levels of glutathione and vitamin E, was significantly more prevalent in the diabetic patients than the matched controls at the beginning of the study. By the trial's conclusion, diabetics that received DHEA had higher DHEA and DHEA sulfate levels, reduced plasma and peripheral blood mononuclear cell reactive oxygen species and HNE, and an increase in glutathione and vitamin E. Pentosidine levels were cut in half in those that received DHEA, indicating reduced AGE formation. There were also indications of downregulation of the TNF-alpha/TNF-alpha receptor system among those who received DHEA. Glucose levels remained relatively unchanged in both groups.

"These data, together with experimental data from rodents, suggest that DHEA treatment might prevent many of the events that lead to cellular damage induced by hyperglycemia, thus counteracting the onset and/or progression of chronic complications in type 2 diabetic patients," the authors conclude. "The usefulness of this novel approach to protect diabetic patients against tissue damage appears to be worth further exploration through multicenter clinical trials."

Health Concern

Diabetes

Glycation and oxidative stress are central to the damage caused by diabetes. Unfortunately, neither of them figures into

conventional treatment for diabetes, which is generally concerned only with blood sugar control.

It is crucial that diabetics (and those predisposed to diabetes) understand the ways in which blood glucose causes damage and take active steps to interrupt these processes. The most notorious process is glycation, the same process that causes food to brown in an oven. Glycation (defined as sugar molecules reacting with proteins to produce nonfunctional structures in the body) is a key feature of diabetes-related complications because it compromises proteins throughout the body and is linked to nerve damage, heart attack, and blindness.

Oxidative stress is also central to the damage caused by diabetes. Diabetics suffer from high levels of free radicals that damage arteries throughout the body, from the eyes to the heart. It is important that diabetics understand their need for antioxidant therapy to help reduce oxidative stress and lower the risk of diabetic complications.

Recent studies have yielded very encouraging results supporting dehydroepiandrosterone (DHEA) supplementation in diabetics. DHEA has been shown to improve insulin sensitivity and obesity in human and animal models (Yamashita R et al 2005). Although its mechanism of action is poorly understood, it is thought that DHEA improves glucose metabolism in the liver (Yamashita R et al 2005).

http://www.lef.org/protocols/metabolic_health/diabetes_01.htm

Featured Products

DHEA Capsules

It has been shown that the hormone DHEA often declines 40.8-72.8% by age 70 or later, leading to hormonal imbalances that can affect one's quality of life. Peak blood levels of DHEA occur at approximately age 25, decreasing progressively thereafter. Thus, scientists have been looking at ways of restoring DHEA to youthful levels, and are now discovering mechanisms by which this hormone protects against age-related decline.

<http://www.lef.org/newshop/items/item00882.html>



7-Keto® DHEA Metabolite

7-Keto® DHEA, a natural metabolite of DHEA, has been shown to safely increase thermogenesis and improving fat loss benefits of diet and exercise three-fold. Antioxidants are added based on the effect 7-Keto has in boosting mitochondrial oxidation.

<http://www.lef.org/newshop/items/item00871.html>



Life Extension magazine

October, 2007 Nutraceutical update: Lipoic acid

One of the underlying problems in diabetes is oxidative stress and the production of free radicals. These free radicals circulate in the body, attacking and damaging tissues. Since people with diabetes have high glucose levels, they are more prone to oxidative stress, which may contribute to the long-term complications of the disease.

Antioxidants such as lipoic acid prevent this damage by neutralizing free radicals and reducing oxidative stress. Lipoic acid is an unusual antioxidant because it can act in both water-soluble and fat-soluble domains in cells and tissues. Thanks to these qualities, it is easily absorbed and transported into many organs and systems within the body, for example, the brain, liver, and nerves. Contrast this with antioxidants such as vitamin C, which is not very lipid-soluble (so is not able to penetrate the lipid wall of cell membranes very well), or vitamin E, which is not very water-soluble. When lipoic acid is combined with these antioxidants, the body's ability to fight free radicals is greatly increased. In fact, lipoic acid helps to regenerate vitamins C and E.

If you have questions or comments concerning this issue or past issues of *Life Extension Update*, send them to ddy@lifeextension.com or call 954 202 7716.

For longer life,



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