

DHEA and Aging

By: Erica Italiano and Christina Germann

Introduction:

Dehydroepiandrosterone, also known as DHEA, is an endogenous hormone secreted by the adrenal gland. It serves as a precursor to the sex hormones testosterone and progesterone. It's levels in the body have been found to decrease after the age of thirty. Some side effects of taking supplements of DHEA can be fatigue, headache, and rapid or irregular heart beats. Although there are several forms of a DHEA supplement, and they can be made from soybeans and wild yams, the body cannot convert it on it's own. There are no natural food sources of DHEA.

DHEA has been reported to have many beneficial effects on the body such as: anti-aging properties, improving heart health, reduction in cortisol, improving the immune system and fighting osteoporosis. However, scientific research does not support all of these claims. We looked at several scientific articles, and found two of significance with regards to DHEA and aging.

For this research, we wanted to find out what scientific evidence is available to either confirm or deny the popular beliefs about DHEA and aging. There is not enough supportive scientific evidence, as of yet, to support the health claims that DHEA is important in the aging process. In

this paper, we are supporting the idea that DHEA might have significant health benefits, but there is still much research that needs to be done.

Discussion:

Study #1: DHEA in Elderly Women and DHEA or Testosterone in Elderly Men

It has been found that the levels of DHEA start to decline in humans after the age of thirty. It is thought that the low levels of DHEA affect some side effects of the aging process, such as decreased bone mineral density, body composition, and quality of life. The objective of this study was to determine the effects of full DHEA replacement and low-dose testosterone replacement on body composition, physical performance, bone mineral density (BMD), and glucose tolerance in elderly people with low androgen levels. They also were looking at the quality of life of the elderly with and without the DHEA supplements. The researchers who conducted this study wanted find out if DHEA supplements actually work as an anti-aging remedy. They conducted the research with the understanding that the long term benefits compared to the potential harm is still unknown.

The study was a two year, randomized, placebo controlled, double-blind study. The 87 male and 57 female participants in the study were all over the age of sixty. They all had DHEA cut-off values of 15% of the

levels of young, healthy adults. There was a baseline group of 75 young, healthy adults, ages 18 to 31 to compare DHEA levels. For the study, the men were delegated into three groups. The first 29 received DHEA, the second 27 received testosterone, and the last 31 received placebo. Of the women, 27 received DHEA and 30 received placebo. Overall, there were significant differences in the DHEA group with respect to levels of sulfated DHEA, LDL cholesterol, fat free mass, and BMD. There was no change, however, in the quality of life scales.

The conclusions made by the authors of this study are that there are positive short-term benefits of taking DHEA supplements. Although the results of the study did show some significant differences in some of the measurement, they were not conclusive enough the support that DHEA supplementation is beneficial to the aging process. The authors emphasize that long-term safety of DHEA therapy is still uncertain, and that more studies need to be conducted.

This study supports our position that DHEA might have beneficial effect for the aging process, however, there still needs to be more studies conducted to determine the long term risks and benefits of the supplement.

This study has several strengths. The first is the type of study that was conducted. A randomized, placebo controlled, double blind study is one of the strongest scientifically supported studies. It reduces the

amount of bias that can influence the study, including the researchers and the participants. Secondly, the study was conducted over a period of two years. This is a reasonably lengthy study, which gave the researchers better data on the long-term effects of DHEA supplementation. Third, the subjects that were studied were of a various background. There were men and women, all over the age of sixty; however, their ages were not specified in the study. They were also compared to a baseline group of varying ages (18–31). Fourth, there was a decent number of participants, 144 total, who were involved in the study. The amount of participants gave them the research numbers, and allowed the researchers to compare and calculate the results to find significant differences.

There were also weaknesses to this study. The first weakness was that they were measuring quality of life. They administered a Health Status Questionnaire to the participants to measure the quality of life. This is being considered to be a weakness because it is hard to assess the quality of life of a person, and compare it to another individual. There are so many factors that influence the quality of life; it can vary from person to person. A second weakness would be the number of participants and length of the study. Although there were 144 participants, which is a generous number, it would seem that a larger number of participants would benefit the research that is needed to find the risks and possible benefits of DHEA supplementation. It would also be

more beneficial to find what the long term (more than 24 months) risks and benefits of DHEA would be.

We support the author's conclusions of this study. We find that the research methods are positive and scientifically sound. We also support that there were beneficial findings in this study, however, there needs to be more research conducted in the long term.

Study #2: Effect of DHEA on Abdominal Fat and Insulin Action in Elderly Women and Men

DHEA supplementation has been shown to lower the amount of abdominal visceral fat and defend against insulin resistance in animals. Since DHEA begins to decline in humans after age 30, this study looked at how taking DHEA supplements affected the elderly population. The purpose of this study was to see if, "DHEA replacement therapy results in a decrease in abdominal fat and an improvement in insulin action in elderly humans"(Nair 2244).

This study was a randomized, double blind, placebo controlled study conducted at Washington University School of Medicine over a three year period. The study subjects were male and female members of the community, aged 65–78 years old. The study participants were given a screening assessment that included medical history, physical exam, and analysis of biochemical parameters. There were a total of 56 participants, half were given DHEA supplementation and the others were given

placebos. The participants “were asked not to alter their diets or physical activity during the study” (2244).

The conclusions of this study were that “there are no significant differences in baseline characteristics between the placebo and the DHEA groups” (2245), although, there were differences between the study groups. The study found that there was a decrease in body weight with the participants that were on the DHEA supplements compared to the participants in the placebo group. The DHEA therapy may have helped a little, but not enough to be statistically significant. As for changes in diet and physical activity, there was no significant difference between the two groups in their caloric intake or energy output, but the DHEA group averaged fewer calories altogether and higher physical activity scores. The DHEA supplements significantly raised women’s testosterone levels, but had no effect on the men. The concentrations of estradiol significantly increased in men and women in response to DHEA therapy. There was a significant difference in decreased abdominal visceral fat between the DHEA group and the placebo group, with 10.2% loss in women and 7.4% loss in men. There was also a decrease in abdominal subcutaneous fat in both men and women on DHEA, averaging at a 6% loss. The authors concluded that, “DHEA replacement could play a role in prevention and treatment of the metabolic syndrome associated with

abdominal obesity” (2243). There still needs to be more research done to possibly find significant results about the effects of DHEA.

The study does not support our position of DHEA having beneficial effects on the aging process. This is because there was not statistically significant evidence that DHEA is helpful with aging.

There were multiple strengths in this study. The first was that it was a randomized, double blind, placebo controlled study. As stated about the last study, this is one of the strongest scientifically supported studies because it reduces bias among the researchers and the participants. The second strength of the study was that they tested multiple variables of the participants. They looked at their diet activity, physical activity, hormone levels, abdominal fat, glucose tolerance, and body mass index. This is a good way to look at the broader spectrum and see what may be affected by the DHEA. The third strength of this study was that they excluded participants that did not meet the criteria. The ways that they were screened was by looking at their medical history, physical exam, analyses of lab values, if they had “had hormone therapy in the past year, a history of hormone-dependent neoplasia, a prostate specific antigen (PSA) level above 2.6ng/mL, or active serious illness” (2244). It is an advantage that they checked these factors because it could have significantly skewed the data.

Along with strengths come weaknesses. This study had a few weaknesses that it could have worked on. The first is that the study did not have a lot of participants. They started out with 128 volunteers, and then 33 were excluded because they did not meet the criteria, and 39 chose not to participate. There were only 56 volunteers that decided to do the study. This is not a lot, considering only half of them (27) were given DHEA therapy and the other half were on a placebo. If more participants had been used there may have been different results. The second weakness of the study was that it was not very long. The study lasted a total of 3 years, but each participant was only on their therapy for 6 months. This may not be long enough to see results; some therapies can take years to work. The third weakness that was noticed was that the age of the participants were older adults aged 65–78. If the therapy had started earlier in life there may have been more beneficial effects on aging. This may be a study that could be conducted to see if it prevents certain aspects of aging from happening.

We support the conclusions that the authors came up with. We find that the research methods are positive and scientifically sound. We also support the findings in this study, however, there needs to be more research conducted in the long term to see if there are more beneficial and significant effects of DHEA therapy.

Conclusion:

We find that, based on the studies explained, there are beneficial effects of DHEA supplementation; however, there need to be more studies conducted. Other studies could possibly look at long term effects and use a larger sample size. There are significant findings that DHEA supplementation is helpful in preventing the side effects of aging, yet there is little known about the long term effects, both benefits and risks.

References

K. Nair, M.D., Ph.D., Rizza, M.D., O'Brien, Ph.D et al. DHEA in Elderly Women and DHEA or Testosterone in Elderly Men N Engl J Med Volume 355:1647–1659 October 19, 2006 Number 16

D. Villareal, MD; J. Holloszy, MD Effect of DHEA on Abdominal Fat and Insulin Action in Elderly Women and Men A Randomized Controlled Trial JAMA, November 10, 2004—Vol 292, No. 18 2243–2248

Official UK DHEA Information Website <http://www.dhea-info.co.uk/index.html> – accessed on 5/3/10

The Mayo Clinic– http://www.mayoclinic.com/health/dhea/NS_patient-dhea accessed on 5/3/10