

New York Times: "No Gain for Elderly from DHEA or Testosterone". Really?

No, not really! I don't generally like to use colloquialisms such as 'really,' but the blurb in NYT's Vital Signs section of the Halloween Sciences Times really was more trick than treat, more obfuscation than information. This article can be found at <http://www.nytimes.com/2006/10/31/health/nutrition/31nost.html>

Nicholas Bakalar apparently didn't read the whole study, just the authors' commentary at the end. He states, "Neither testosterone replacement nor the widely sold anti-aging supplement DHEA has any discernible beneficial effects in elderly people, a new study suggests." Let's see why this statement just doesn't jive with the facts as revealed by the data in the study.

Published in the October 19, 2006 issue of The New England Journal of Medicine, the study by Dr. S. K. Nair *et al*, looked at the effect of two years of DHEA replacement in elderly women and DHEA or testosterone in elderly men on various parameters of aging.(1) In the opening sentence of the study, the authors make it clear that they want to assess the effect of DHEA and testosterone as "antiaging supplements." They do this by measuring the effect of these hormones in 87 "elderly" men and 57 "elderly" women on physical performance (measures of strength and aerobic capacity), body composition, bone mineral density (BMD), glucose tolerance (ability to keep blood sugar in the normal range after a load of sugar), and quality of life (by a standardized questionnaire).

The conclusion the authors draw is what Bakalar reports: "Neither DHEA nor low-dose testosterone replacement in elderly people has physiologically relevant beneficial effects on body composition, physical performance, insulin sensitivity, or quality of life."

Missing from this conclusion, but reported in the results, is what happened to the BMD. *It increased.* In men receiving testosterone there was a statistically significant increase in BMD at the femoral neck (part of the hip). In women receiving DHEA, there was a statistically significant increase in bone in the distal radius (the part commonly fractured when older women fall forward and attempt to brace their fall with their out-stretched arms).

Bakalar, following the authors' lead, concludes that while these increases did take place and are statistically significant, they are only slight and don't deter him from reporting "No Gain" If we look more closely at the "healthy elderly" subjects enrolled in this study, the gains in BMD are rather interesting. The baseline bone density in the men in spine was equivalent to that of a 35 year old male, and in the hip to a 45 year male. In the women, the average bone density was equivalent to a 50 year old. Now you know why I put 'elderly' in quotations above. These chronologically 70 year old subjects had the bone density of much younger people. Given this excellent starting bone density, the fact that there was any increase at all, much less 2 percent in the femoral neck, is startling. These men were not your average 70 year olds, at least not a from a bone density standpoint. You simply cannot conclude from this study what effect the treatments would have had on the BMD of elderly men who had average BMD *for their age*. I respectfully suggest that it would have been physiologically relevant indeed.

The other important fact one must bear in mind when interpreting the results independent of the authors' conclusions is the adequacy of the intervention. The DHEA replacement was more than adequate in both groups. The testosterone in men was hardly replacement, a fact begrudgingly alluded to when they use the term "low-dose" testosterone. At no point during the 24 month trial did the average bioavailable testosterone level cross above the bottom of the normal range for young men, and it was checked every 3 months. In fact, the level only rose 30 ng/dL, whereas for it to qualify for replacement (to bring it into the normal youthful range), it would have had to rise two to three times that much.

What about body composition? No physiologically relevant increase? Again, Not Really! In men on testosterone, there was a highly statistically significant increase in fat-free mass of 1.4 kg (3 lbs) and almost statistically significant increase in the men on DHEA versus placebo. When data from men and women on DHEA were combined, there was a statistically significant increase in fat-free mass as well. Is 3 lbs of fat-free mass important? For every kilogram of fat-free mass your body has, it burns approximately 25 calories a day while you are just sitting on your butt. Multiply that by 365 days and you get 9125 calories a year extra that you can eat without gaining more fat, or 2.6 lbs of fat you'll lose. If you choose the latter, in four years, you'll be 10 lbs of fat lighter.

Why do the authors say that these increases are physiologically irrelevant? Because they don't understand what an important antiaging effect is. Aging causes a 1 to 2 percent decline in the structure and function of almost all organ systems. Doesn't sound like a lot, but over time, it cuts through your vitality like the water running through the Grand Canyon's river bed. An effective antiaging treatment will reverse that effect on the same time scale. The DHEA and testosterone doses used in this study did exactly that. They took healthy older men and women and slowed down and slightly reverse the changes in body composition that occur with aging.

The authors discount this effect saying that they could have achieved better effects with exercise alone. Well that is possibly true, but that doesn't mean that the treatments didn't work, and at least one study "provides evidence that DHEA replacement has the beneficial effect of enhancing the increases in muscle mass and strength induced by heavy resistance exercise in elderly individuals."⁽²⁾ Does anyone suggest that you shouldn't maintain a healthy diet and exercise while taking your cholesterol lowering medication? Not really.

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1. **Nair KS, Rizza RA, O'Brien P, et al.** DHEA in elderly women and DHEA or testosterone in elderly men. *N Engl J Med.* 2006;355(16):1647-59.
2. **Villareal DT, Holloszy JO.** DHEA enhances effects of weight training on muscle mass and strength in elderly women and men. *Am J Physiol Endocrinol Metab.* 2006;291(5):E1003-8.