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Clinical Trial on DHEA in Elderly Women and DHEA or Testosterone in Elderly Men

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Dehydroepiandrosterone (DHEA) and testosterone are widely promoted as anti-aging supplements but long-term benefits as compared with potential adverse effects are unknown. We performed a two-year placebo-controlled randomized double-blind study involving 87 elderly men with low levels of sulfated form of DHEA (DHEA-S) and bioavailable testosterone (Bio-T) and 57 elderly women with low levels of DHEA-S. Among men, 29 received DHEA, 27 received testosterone, and 31 received a placebo. Among women, 27 received DHEA, and 30 received placebo. Outcome measures included physical performance, body composition, fatty acid flux, whole body and muscle protein synthesis, bone mineral density (BMD), glucose tolerance, insulin sensitivity, and quality of life. Compared with changes from baseline on 24 month in placebo group, participants who received DHEA for two years had an increase in plasma levels of DHEA-S levels of 9.2 mmol/L in men and 10.3 mmol/L in women. Among elderly men who received testosterone, the level of Bio-T increased by a median of 1.1 nmol/L, as compared with change in placebo group. A separate analysis of men and women showed no significant effect of DHEA on body composition measurements. Neither hormone altered peak volume of oxygen consumption per minute, muscle strength, or insulin sensitivity. Neither DHEA nor testosterone also had any impact on fatty acid flux. Although older people were found to have a lower whole body protein turnover and muscle protein synthesis, neither DHEA nor testosterone increased these parameters. Men who received testosterone had a slight increase in fat free mass and men in both treatment groups had an increase in BMD in the femoral neck. Women who received DHEA had an increase in BMD in ultradistal radius. Neither treatment improved the quality of life or had any major adverse effects. However, we also noted that women who received DHEA had an adverse effect on high density lipoprotein protein particle size unlike men who did not have any adverse effects. Further studies in post-menopausal women no beneficial effect when supplemented with exercise. In conclusion, neither DHEA nor low dose testosterone replacement in elderly people has any physiologically relevant beneficial effects on physical performance, body composition, protein accretion, insulin sensitivity, or quality of life. The changes in HDL particle size may have potential adverse effect in elderly women.