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Androgens and diabetes in men: Results from the Third National Health and Nutrition Examination Survey (NHANES III)

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Abstract: **OBJECTIVE** - Low levels of androgens in men may play a role in the development of diabetes; however, few studies have examined the association between androgen concentration and diabetes in men in the general population. The objective of this study is to test the hypothesis that low normal levels of total, free, and bioavailable testosterone are associated with prevalent diabetes in men. **RESEARCH DESIGN AND METHODS** - The study sample included 1,413 adult men aged (greater-than or equal to 20 years who participated in the morning session of the first phase of the Third National Health and Nutrition Examination Survey, a cross-sectional survey of the civilian, noninstitutionalized population of the U.S. Bioavailable and free testosterone levels were calculated from serum total testosterone, sex hormone-binding globulin, and albumin concentrations. **RESULTS** - In multivariable models adjusted for age, race/ethnicity, and adiposity, men in the first tertile (lowest) of free testosterone level were four times more likely to have prevalent diabetes compared with men in the third tertile (odds ratio 4.12 (95% CI 1.25-13.55)). Similarly, men in the first tertile of bioavailable testosterone also were approximately four times as likely to have prevalent diabetes compared with men in the third tertile (3.93 (1.39-11.13)). These associations persisted even after excluding men with clinically abnormal testosterone concentrations defined as total testosterone <3.25 ng/ml or free testosterone <0.07 ng/ml. No clear association was observed for total testosterone after multivariable adjustment (P for trend across tertiles = 0.27). **CONCLUSIONS** - Low free and bioavailable testosterone concentrations in the normal range were associated with diabetes, independent of adiposity. These data suggest that low androgen levels may be a risk factor for diabetes in men. © 2007 by the American Diabetes Association