

Shores MM, Smith NL, Forsberg CW, Anawalt BD, Matsumoto AM.
Testosterone treatment and mortality in men with low testosterone levels.

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Abstract: Context: Low testosterone levels in men have been associated with increased mortality. However, the influence of testosterone treatment on mortality in men with low testosterone levels is not known. Objective: The objective of the study was to examine the association between testosterone treatment and mortality in men with low testosterone levels. Design: This was an observational study of mortality in testosterone-treated compared with untreated men, assessed with time-varying, adjusted Cox proportional hazards regression models. Effect modification by age, diabetes, and coronary heart disease was tested a priori. Setting: The study was conducted with a clinical database that included seven Northwest Veterans Affairs medical centers. Patients: Patients included a cohort of 1031 male veterans, aged older than 40 yr, with low total testosterone [≤ 250 ng/dl (8.7 nmol/liter)] and no history of prostate cancer, assessed between January 2001 and December 2002 and followed up through the end of 2005. Main Outcome Measure: Total mortality in testosterone-treated compared with untreated men was measured. Results: Testosterone treatment was initiated in 398 men (39%) during routine clinical care. The mortality in testosterone-treated men was 10.3% compared with 20.7% in untreated men ($P < 0.0001$) with a mortality rate of 3.4 deaths per 100 person-years for testosterone-treated men and 5.7 deaths per 100 person-years in men not treated with testosterone. After multivariable adjustment including age, body mass index, testosterone level, medical morbidity, diabetes, and coronary heart disease, testosterone treatment was associated with decreased risk of death (hazard ratio 0.61; 95% confidence interval 0.42-0.88; $P = 0.008$). No significant effect modification was found by age, diabetes, or coronary heart disease.

Conclusions: In an observational cohort of men with low testosterone levels, testosterone treatment was associated with decreased mortality compared with no testosterone treatment. These results should be interpreted cautiously because residual confounding may still be a source of bias. Large, randomized clinical trials are needed to better characterize the health effects of testosterone treatment in older men with low testosterone levels. Copyright © 2012 by The Endocrine Society