

LOW FREE TESTOSTERONE PREDICTS FRAILTY IN OLDER MEN. THE HEALTH IN MEN STUDY

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Background: The prevalence of frailty increases with age and testosterone levels decrease as men age. The aim of this study was to determine whether testosterone levels were associated with frailty. Methods. Between 2001 and 2004, frailty was measured in 3,616 community-dwelling men aged 70-88 years and re-assessed in 2008-09 in 1,586 of these men now aged 76-93 years. Frailty was assessed with the FRAIL scale, comprising 5 domains: fatigue; difficulty climbing a flight of stairs; difficulty walking more than 100 metres; more than 5 illnesses present; or weight loss greater than 5%. Testosterone, sex hormone binding globulin (SHBG) and luteinizing hormone (LH) were assayed at baseline. Free testosterone was calculated using mass action equations. Results: At baseline 15.2% of men were frail (≥ 3 deficits), increasing to 23.0% at follow-up. At baseline, after adjusting for age, body mass index, smoking, diabetes, social support, and vision and hearing impairments, one standard deviation decreases in both total and free testosterone were associated with an increase in the likelihood of frailty (OR=1.23; 95% CI: 1.11 – 1.38 and OR=1.29; 95% CI 1.15 – 1.44 respectively). Lower LH was associated with reduced odds of frailty (OR=0.88; 95% CI 0.81, 0.95). At follow-up, only lower free testosterone levels (OR=1.22; 95% CI 1.05, 1.42) were associated with frailty. Conclusions: Lower free testosterone was independently associated with frailty cross-sectionally and longitudinally. This could indicate that testosterone levels are causally related to frailty or that declining testosterone and increasing frailty share common risk factors.