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Evidence for the integration of total and free testosterone in management of prostate cancer

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Introduction & Objectives: Within the context of prostate cancer (PC), there has been a historic fear of high serum testosterone, a hesitance towards testosterone supplementation, and a resultant lack of systematized testosterone screening. Herein, we seek to investigate the utility of serum total and calculated free testosterone (cFT) in PC management.

Materials & Methods: 830 patients underwent RP, with prospectively-drawn total testosterone (TT), sex hormone binding globulin (SHBG), and cFT. Impact of age was assessed with linear regression modeling. Correlation of low cFT with adverse oncologic characteristics [i.e. high-risk Gleason Grade Group (GGG) 9-10, extraprostatic extension (pT3/pT4) and seminal vesicle invasion (SVI)] was assessed with receiver-operator characteristic (ROC) curves.

Results: Levels of TT remained constant as men aged (0.09 per year; R=0.02), while SHBG increased (0.87 per year; R=0.32), and cFT decreased (0.08 per year; R= -0.2). Low cFT independently predicted very high-risk GGG (AUC=0.435, p=0.036), extraprostatic extension (AUC=0.557, p=0.011), and SVI (AUC=0.396, p=0.005) TT was not a predictor.

Conclusions: TT remained stable as men aged, while cFT decreased 2-3% per year. Low cFT was an independent predictor of more aggressive, high-risk disease and adverse pathological characteristics. These relationships stress the importance of cFT integration into prostate cancer management.

Figure 1: Trends of TT, cFT, and SHBG by age.

Trends of TT, SHBG, and FT across Age

Figure 2: Gleason Grade Group prevalence by cFT quartile.