THE PREDICTIVE EFFECT OF FREE TESTOSTERONE ON SEXUAL FUNCTION INCREASES WITH AGE

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Introduction

Biochemically low total testosterone (TT<300) is one of the diagnostic criteria for hypogonadism, but current guidelines do not account for free testosterone (FT) in this assessment. Further, FT is known to decrease over the male lifespan, while the prevalence of hypogonadism increases as men age. We seek to further understand the relationship between FT and sexual function in middle-aged to older men with prostate cancer.

Methods

820 men underwent Robot-Assisted Radical Prostatectomy (RARP) for primary treatment of localized prostate cancer. Pre-operative evaluation included assessment of sexual function through the International Index of Erectile Function (IIEF-5) score and baseline sex hormone measurement of TT, Sex-Hormone Binding Globulin (SHBG), and a calculated FT (cFT). Patients were then stratified by age into a younger (40-60 years old) and older (60-80 years old) cohort.
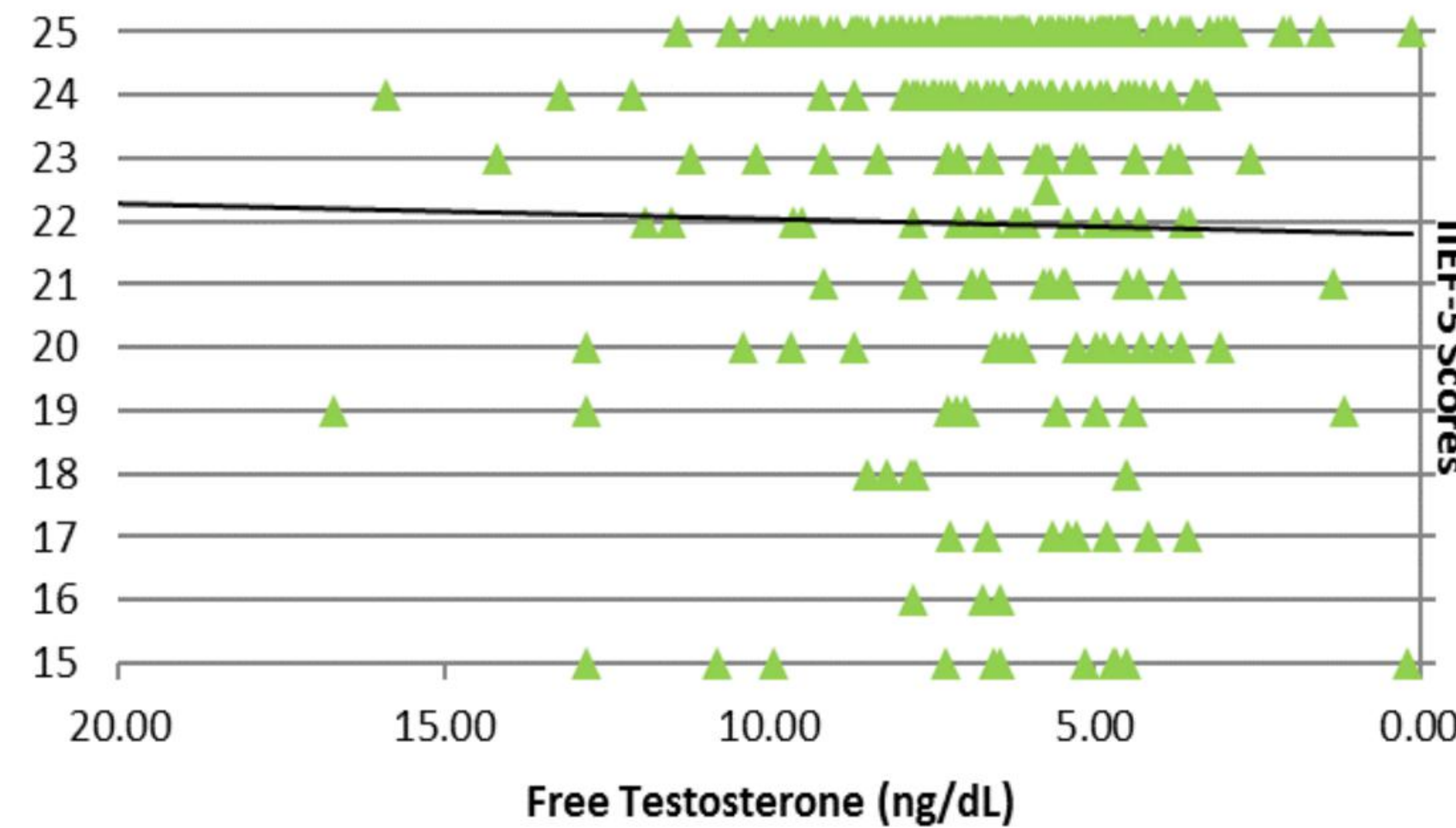
Results

The average, median, and 25th percentile of cFT for our entire cohort were determined to be 6.02, 5.60, and 4.42ng/dL, respectively. Overall, 291 (35.4%) patients were between 40-60 years of age. Distributions of IIEF-5 scores in the younger group were as follows – 22-25: 71%; 15-21: 23%; <15: 6%. In the older cohort, men reported significantly lower scores in general (22-25: 40%; 15-21: 33%; <15: 27%) (p < 0.001).

Furthermore, older men reported worse erectile function at a predetermined low cFT compared to younger men. Only 30% of men 60-80 years of age reported an IIEF-5 score between 22-25 with a cFT below the 25th percentile (<4.42). In 40-60 year olds, however, 65% reported IIEF-5 scores between 22-25 below this cutoff (p = 0.001).
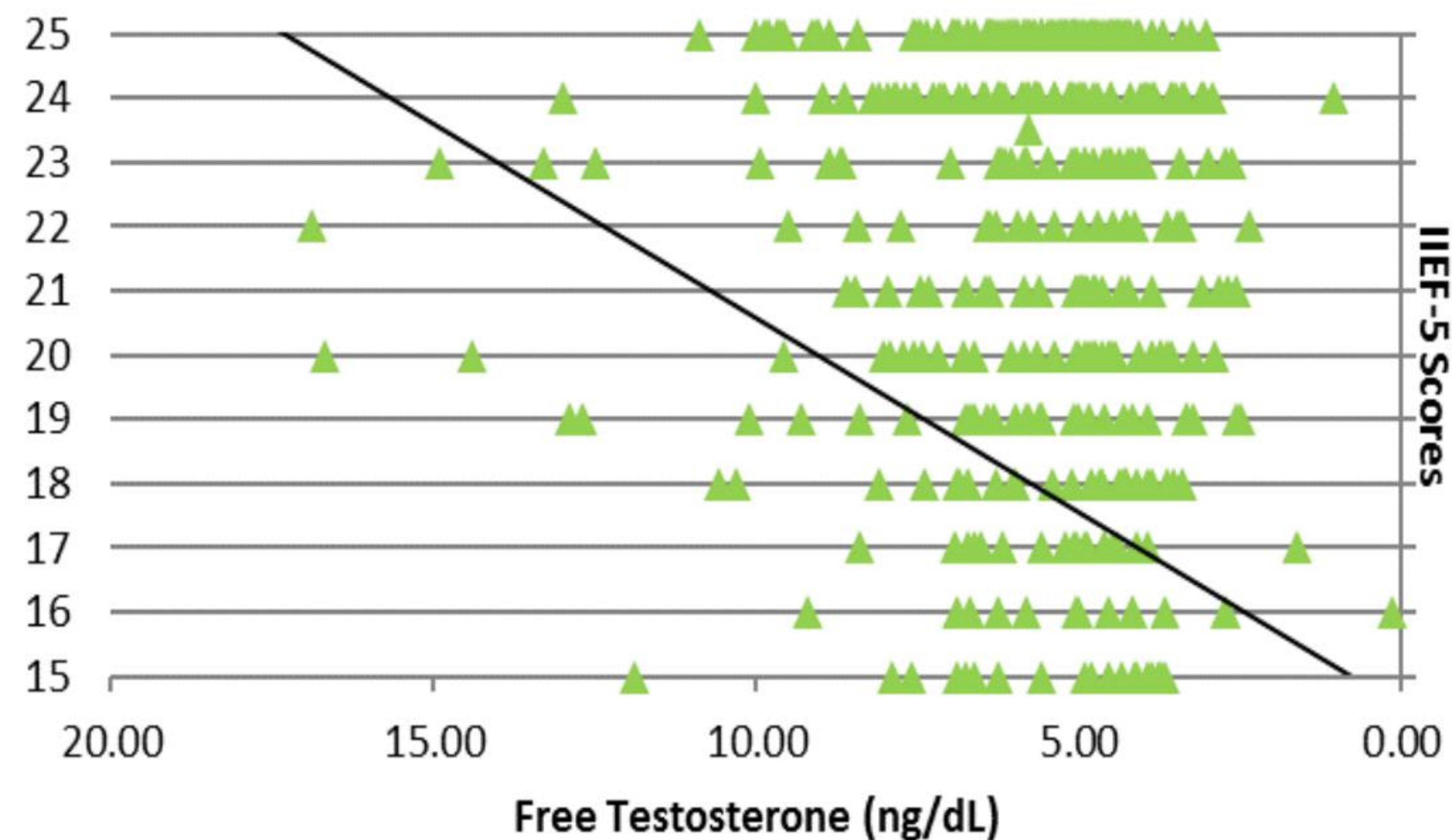
cFT displayed a stronger correlation (Figures 1 and 2) with IIEF-5 score in older men (r = 0.21) compared to younger men (r = 0.02).

Figure 1: cFT vs IIEF-5 in patients 40-60 years old

For each unit decrease of cFT, IIEF-5 score decreased by **only 8% in men between 40 and 60 years of age.**

Figure 2: cFT vs IIEF-5 in patients 60-80 years old

For each unit decrease of cFT, IIEF-5 score decreased by **30% in men between 60 and 80 years of age.**

Table 1: Stepwise Linear Regression of men 40-60 years of age

In younger men, cFT **did not demonstrate a meaningful effect** on IIEF-5 score after adjusting for other variables (R = 0.027, 95% CI: -0.105 – 0.158; p = 0.690).

Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	38.375	4.212		9.111	.000
	Age (cont.)	-.230	.067	-.198	-3.418	.001
	BMI (cont.)	-.151	.077	-.113	-1.954	.052
	GGG (<9 [ref] vs. 9-10)	.098	.255	.022	.386	.700
2	(Constant)	38.117	4.267		8.932	.000
	Age (cont.)	-.229	.067	-.197	-3.392	.001
	BMI (cont.)	-.152	.078	-.113	-1.958	.051
	GGG (<9 [ref] vs. 9-10)	.112	.257	.025	.434	.665
	FT (cont.)	.027	.067	.023	.399	.690

Table 2: Stepwise Linear Regression of men 60-80 years of age

In older men, cFT was **significantly correlated** with IIEF-5 score after adjusting for age, BMI, and Gleason Grade (R = 0.292, 95% CI: 0.050 – 0.535; p = 0.018).

Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	64.644	4.953		13.053	.000
	Age (cont.)	-.551	.064	-.357	-8.605	.000*
	BMI (cont.)	-.304	.081	-.155	-3.766	.000*
	GGG (<9 [ref] vs. 9-10)	-.487	.243	-.083	-2.009	.045*
2	(Constant)	60.509	5.230		11.569	.000
	Age (cont.)	-.523	.065	-.339	-8.065	.000*
	BMI (cont.)	-.285	.081	-.146	-3.531	.000*
	GGG (<9 [ref] vs. 9-10)	-.457	.242	-.078	-1.889	.059
	FT (cont.)	.292	.124	.099	2.367	.018*

Conclusion

Our results show that lower FT levels are not predictive of IIEF-5 scores in patients 40-60 years old, but have a strongly negative effect on IIEF-5 scores in patients 60-80 years old. All men undergoing RARP should have a cFT assessed, as this may have implications for post-operative sexual function recovery.