Clin-IQ Project

Clinical Question: Among all adult males independent of comorbidities, which adult males should be tested for testosterone deficiency?

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Answer: All males who are symptomatic for low libido, fatigue, muscle wasting.

Level of Evidence for the Answer: B

Search Terms: testosterone deficiency, male, libido, fatigue, screening, age > 40, hypogonadism.

Date Search was Conducted:

10/6/12

Inclusion and Exclusion Criteria:

Inclusion Criteria: Males, testosterone

Exclusion Criteria: female, children, age

Summary of the Issues: (word count=250)

Testosterone is essential for normal sexual development and function. Aging and certain disease states leads to declines in androgen production that can lead to testosterone deficiency. Common symptoms of a loss of testosterone include erectile dysfunction, decreased libido, fatigue, anemia, difficulties concentrating, mild depression, muscle weakness, increased body fat and reduced muscle mass. Testosterone levels begin to decline in men as early as age 30. By age 40-60, 25% of men may have low free testosterone. This percentage will rise to up to 70% at age 70. For screening purposes it is noted that more men are hypogonadal by free

testosterone index than by total testosterone after age 50, and there seems to be a progressively greater difference between the two with increasing age. This is likely due to increasing sex hormone binding globulin (SHBG), which naturally increases with age and binds the biologically active free testosterone.

Age, chronic disease (such as diabetes or obesity), weight and medications can all affect testosterone reduction. Hypogonadism, also referred to as andropause, androgen deficiency of aging or late-onset hypogonadism (LOH) can contribute to frailty, sarcopenia (age related loss of muscle mass), poor muscle quality and weakness, hypertrophy of adipose tissue and impaired neurotransmission. Testosterone replacement therapy can potentially improve functional status and quality of life in the aging male population although definitive studies are lacking. Patients who present with any of these conditions should be considered for testing for testosterone deficiency.[1] It remains unclear when to screen for testosterone deficiency in the absence of symptoms. Unlike other screening modalities, it has yet to be shown that screening and treatment of testosterone deficiency has a universal benefit or sustained benefits that outweigh potential risks.

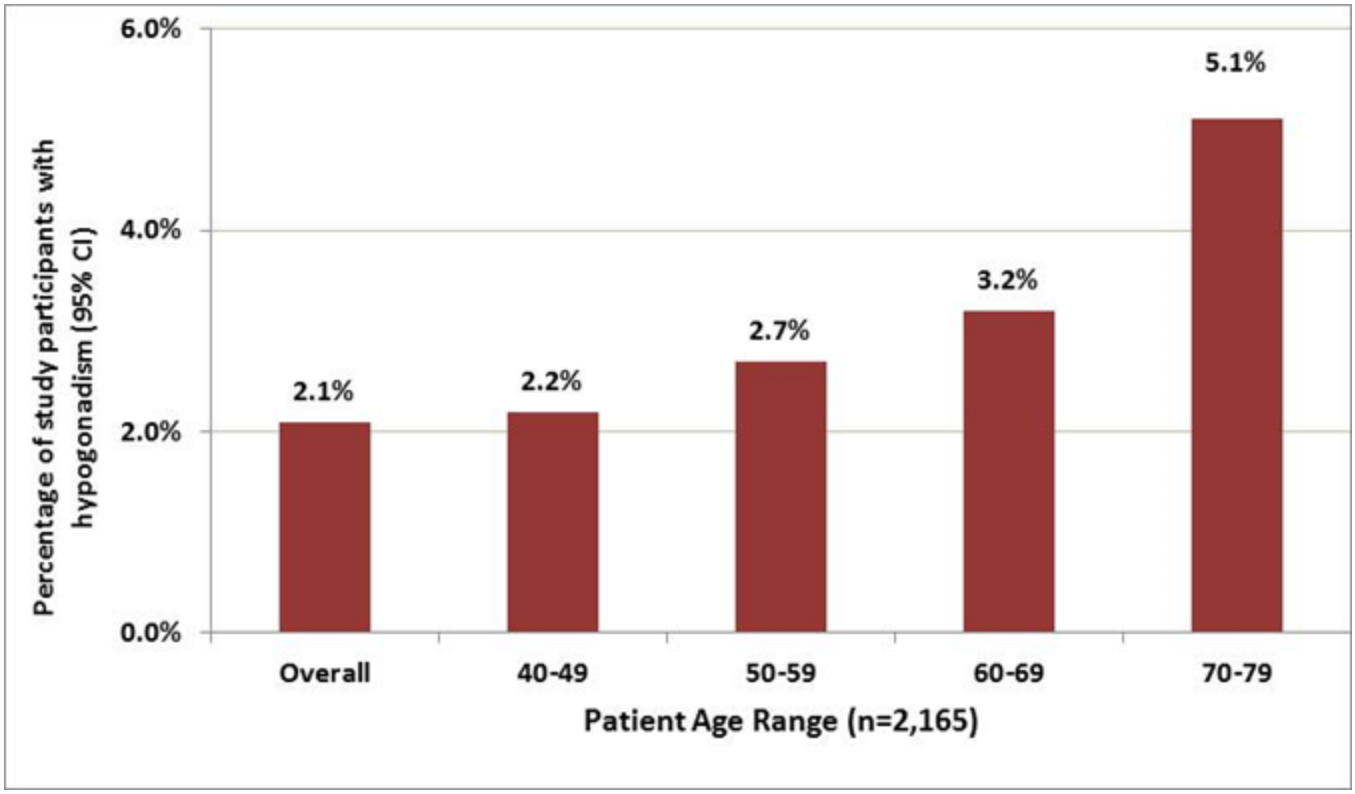
Summary of the Evidence: (word count=547)

An overall picture of testosterone deficiency increasing with age is evident upon review of a multitude of studies. In order to shed light on issues pertaining to the screening for testosterone deficiency three separate studies were investigated.

The Hypogonadism in Males (HIM) study[2] performed in 2003-2004 is an example of a biochemical prevalence study. This was a cross-sectional study of 2165 men aged 45 years and older who had visited a primary care office for any reason, not necessarily for testosterone deficiency associated complaints (see Figure 1). Based on a total testosterone of <300 ng/dL, 39% of the men were defined as being hypogonadal; for every 10 year increase in age, the risk of

hypogonadism increased by 17%. By extrapolating to national census data, the HIM authors estimated that 13.8 million men (39%) aged 45 and older who visit a primary care physician in the United States might be biochemically testosterone deficient; evidence to suggest that age in itself may precipitate screening for testosterone deficiency.

Figure 1. Prevalence of Hypogonadism by Age[2]



In comparison to HIM, prevalence was found to be lower in the Massachusetts Male Aging Study (MMAS), which assessed the hypothesis that endocrine profiles change with aging independently of specific disease states in a population-based random sample of 40 to 70 year-old men; largely focusing on impotence as the causal screening method.[3] In this study (N = 1,491), testosterone deficiency was defined by the presence of at least 3 signs or symptoms (decreased sexual function, increased fatigue, low bone mineral density, depressed mood, mild anemia, etc.) plus a total testosterone level of <200 ng/dL; or signs/symptoms plus total

testosterone of 200 to 400 ng/dL plus free testosterone <8.91 ng/dL. The prevalence of testosterone deficiency was estimated to be between 6% and 12%.

The European Male Aging Study (EMAS) defined testosterone deficiency in a random sample of 3369 men aged 40 to 79 years.[4] The list of qualifying testosterone deficiency symptoms was truncated on the strength of each symptoms association with low levels of total testosterone (<317 ng/dL) and free testosterone (<6.34 ng/dL). The three symptoms that made the final cut were sexual: poor morning erection, low sexual desire, and erectile dysfunction (ED). Defined by these symptoms and biochemical evidence, the prevalence of hypogonadism was estimated at 2.1% overall, increasing from as little as 0.1% in men aged 40 to 49 to 5% in men aged 70 to 79. Prevalence also rose with increasing body mass index and increasing number of comorbidities. Like EMAS, the HIM study noted a higher testosterone deficiency prevalence in men with comorbidities, most significantly in those who were obese or had diabetes, hypertension, rheumatoid arthritis, hyperlipidemia, or osteoporosis. The risk of having low testosterone levels was 2.4 times higher for obese men, 2.1 times higher for men with diabetes, 1.8 times higher for men with hypertension, and 1.5 times higher for those with hyperlipidemia.

At the 2011 annual meeting of the American Urological Association (AUA), expert panelists named obesity and diabetes as comorbidities in younger men, but added others such as chronic opiate use, steroid abuse, stress, and possibly genetic factors. Long-term opiate use and chronic pain are comorbidities of testosterone deficiency being seen with increasing frequency in primary care settings.[5]

Conclusion: (word count=109)

Screening for testosterone deficiency is reasonable for specific complaints including fatigue, impotence, depression or an array of other indicators. Practitioners should keep in mind that as men age, testosterone levels fall and therefore the likelihood of finding testosterone

deficiency increases. Thus far, outcome studies pertaining to testosterone replacement have had mixed results in improving quality of life. Until further studies are performed which clarify outcomes with testosterone replacement, our recommendation would be to only screen the symptomatic individual rather than strictly on the basis of age.

Reference List:

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