

Review Article

Male hypogonadism: The unrecognized cardiovascular risk factor

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Testosterone

Abstract. Normal levels of male sex hormones are essential to men's health. Many studies demonstrate that hypogonadal men are at higher risk for developing a host of metabolic derangements, including dyslipidemia, type 2 diabetes mellitus, obesity, and hypertension. We examined the most recent studies supporting this notion of hypogonadism as a cardiac risk factor by reviewing all relevant PubMed data. Most studies showed an increase in metabolic disorders and cardiac events in hypogonadal men compared to their eugonadal counterparts. Mechanisms explaining this increased risk include adverse cytokine profiles produced by excess adipose tissue, abnormal lipid metabolism by understimulated hormone-sensitive lipase, and abnormal cellular respiration leading to insulin resistance. In contrast, some studies have not demonstrated such an increased cardiac risk. Conflicting data between studies is expected, given the complexity of testosterone and its metabolic effects. Additionally, the interaction of testosterone with the androgen receptor differs based on an individual genome. Hypogonadism will affect individual men differently because of this genomic variance. The literature points toward true hypogonadism as a major cardiac risk factor. Men at risk of being hypogonadal should be screened and brought back to eugonadism with hormone replacement.

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Testosterone serves to maintain health in every system of the body. It is produced mainly in the Leydig cells of the testes in response to luteinizing hormone release from the pituitary gland. Testosterone acts on muscle, bone, bone marrow, testes, and the central nervous system through direct effects on target tissues, as well as through the effects of its metabolites estradiol and dihydrotestosterone (DHT). Estradiol is produced by the aromatase enzyme in adipose tissue and the more potent androgen DHT is produced by the 5- α reductase enzyme in prostate and skin (see Fig. 1).

Because of its diverse effects, the task of describing

testosterone's cardiovascular effects may prove to be even more difficult than the female sex hormone estrogen. The Woman's Health Initiative (WHI) attempted to establish a beneficial role for estrogens in preventing heart disease, but instead discovered an increase in heart disease during the study. In parallel, testosterone, once believed to have negative effects on heart disease, is now emerging as essential to men's health, highlighting the importance of male eugonadism.

Hypogonadism in the community

Physicians identify and treat hypogonadal men based on symptoms of low testosterone, including decreased libido,

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