LOW TESTOSTERONE LEVEL IS ASSOCIATED WITH IMPAIRED MICROVASCULAR FUNCTION IN MEN

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Authors: Frank Edward Corrigan, Danny Eapen, Pankaj Manocha, Muhammad Hammadah, Suliman Alradawi, Jennifer Vazquez, Lynn Cunningham, Irina Uphoff, Laurence Sperling, R. Wayne Alexander, Kenneth L. Brigham, Arshed Quyyumi, Emory University School of Medicine, Predictive Health Initiative, Atlanta, GA, USA

Background: Low testosterone level in men is associated with increased adiposity, insulin resistance and dyslipidemia, whereas high testosterone levels are associated with decreased aortic atherosclerosis. Endothelial function and microvascular reactivity can be measured noninvasively and are measures of long term cardiovascular risk. We hypothesized that low testosterone levels contribute to increased cardiovascular risk by influencing microvascular and endothelial function.

Methods: We recruited 212 males, aged 50 ± 12 years, from the Emory Center for Health Discovery and measured cardiovascular risk factors, total serum testosterone, endothelium-dependent brachial artery flow-mediated dilation (FMD), fingertip digital reactive hyperemia index (RHI) using Endo-PAT (Itamar, Inc) during forearm ischemia and hyperemia as an index of microvascular function. Spearman correlations and multivariate linear regression were performed adjusting for relevant clinical variables.

Results: Testosterone level correlated positively with RHI (r= 0.2, p= .004) suggesting that low levels are associated with impaired microvascular hyperemia. This association between testosterone level and RHI remained significant even after multivariate adjustment for age, race, mean arterial pressure, body mass index, diabetes, current tobacco use, HDL, and total cholesterol (B= 0.001, p= .014). Testosterone level was not associated with FMD.

Conclusions: In healthy men, lower serum testosterone level is associated with reduced digital reactive hyperemia, a measure of microvascular function, but not large arterial nitric oxide activity. Since impaired microvascular function is associated with worse long term outcomes, whether replenishing testosterone will improve function and long term risk needs to be further investigated.