Dynamic Chiropractic

CHIROPRACTIC (GENERAL)

Giving Testosterone Levels a Boost (Part 2)

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In part one of this three part series, I introduced peer-reviewed science that shows "atleast 1 in 4 men over 30 have low testosterone."[1-4] With regard tocommon symptoms, these men suffer with "reductionsin motivation, initiative, self-confidence, concentration and memory, sleepquality, muscle bulk and strength, diminished physical or work performance,feeling sad or blue, depressed mood, mild anemia, and increased body fat andbody mass index."[5-6]

Men with low serum total testosterone concentrations are at significantly greater risk for death from any cancer, cardiovascular disease or respiratory disease.[7] Even more troubling is the greater incidence of cardiovascular events in men whose testosterone levels are much *higher* than what's commonly considered as "low." This is alarming because as a study published in the *Journal of the American College of Cardiology* demonstrated, it doesn't matter if a man's total testosterone is very low (below 340 ng/dL) or moderately low (up to 549 ng/dL) – *all* men with levels below 549 ng/dL show an increased risk for suffering a cardiovascular event.[8]

Fascinating is the fact that science shows exactly *why* aging men are experiencing a loss of healthy testosterone as they age: chronic stress, resulting in *hyper*cortisolemia. The mechanisms of action are several-fold. Acting through the classic glucocorticoid receptor, cortisol directly inhibits testosterone production in testicles by Leydig cells;[9-11] and stimulates the activity of the aromatase complex;[12-15] in turn, aromatase increases the conversion of circulating testosterone into estradiol while decreasing testosterone concentrations.[12-15]

T Levels in Practice: The Classic Male Patient

How do sagging testosterone levels affect chiropractic practice? Think of your typical overweight male patient who presents with central adiposity (a telltale sign of high aromatase expression) coupled with chronic back pain that just won't go away. Research published as recently as 2012 shows that "low testosterone" could be a causal factor for increased pain in this type of chronically stressed patient.

For example, one study evaluated 46 healthy men during resting and stressful conditions, measuring pain thresholds, pain and anxiety ratings, and testosterone and cortisol levels.[16] In these men, stress significantly increased anxiety ratings and cortisol levels, and decreased testosterone levels.[16] Increased stress / cortisol levels also increased pain ratings and decreased pain thresholds, while lower testosterone levels were positively correlated with increased pain.[16]

Results indicated that testosterone can decrease and cortisol can increase pain, suggesting that acute clinical pain may be relieved by controlling stress / cortisol and managing consequent stress-related low testosterone concentrations.[16]

The Connection Between Testosterone and Insulin

From a "whole body health" standpoint, add to this list an additional mechanism of action: Stress / cortisol also directly interferes with healthy insulin physiology. This is seen when healthy men exhibit fasting plasma glucose concentrations and degrees of insulin resistance that are *directly correlated with fasting plasma cortisol concentrations* (i.e., when cortisol goes up, insulin goes up, insulin resistance goes up, and insulin sensitivity correspondingly goes down).[17-18]

It turns out that fasting plasma glucose *and* insulin concentrations are directly correlated with fasting plasma cortisol concentrations,[19-22] and the degree of insulin sensitivity is inversely correlated with fasting plasma cortisol concentrations (i.e., again, higher cortisol levels raise insulin levels *and* lower insulin sensitivity).[19-22] So, in essence, hypercortisolemia plays a role as a "diabetic switch," setting the stage for dysglycemia, metabolic syndrome and diabetes in the future.

The subject of insulin and insulin sensitivity ties directly into testosterone, as "testosterone and insulin status are also directly correlated."[23-31] Among adult men, the insulin secretion rate and fasting plasma insulin concentration are inversely proportional to serum testosterone concentrations (i.e., high insulin levels are associated with low testosterone and low insulin levels are associated with high testosterone),[23] while whole-body insulin sensitivity is shown to be positively correlated with serum testosterone concentrations.[23-24]

In other words, in men who have challenges with high postprandial blood sugar levels, simple carbohydrates that evoke an insulin spike / increase will sabotage the production of healthy testosterone. While this is not likely to be an issue in young men, who can consume carbohydrates and their blood sugar / insulin recovers quickly, it is one of the most likely "troubleshooting" keys to help discover why an overweight male patient may have chronically low testosterone. In these men, avoiding simple carbohydrates may be a powerful key to boosting healthy testosterone – now and in the future.

Testosterone and Insulin Facts

- Testosterone and insulin status are directly correlated in non-exercising men.[23-31]
- The serum testosterone concentration and the fasting plasma insulin concentration are inversely proportional in non-exercising men.[23-31]
- Testosterone directly stimulates glucose uptake in muscle.[32]
- Increasing serum testosterone concentration increases insulin sensitivity in men.[23-31]

In the third and final installment of this article series, I will outline a three-step program that combines diet, exercise and supplementation, based on peer-reviewed science, to help boost testosterone in otherwise healthy male patients.

Editor's note: Read the conclusion of Dr. Smith's series in the March 1 issue of *DC*.

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