Overlooked Causes for Low Testosterone, and Overlooked Natural Protocols

By Lynn Toohey, Ph.D.

Low testosterone, or "low T" as it is commonly called now, seems to be a current concern for many men and women. However, three major causes for low testosterone are commonly overlooked. Also, there are several overlooked natural protocols for addressing this deficit rather than turning to drug therapy or hormone replacement, and this deserves consideration, especially given that any hormone supplementation may carry risk. That said, low testosterone is not good. Testosterone has purported health benefits, it decreases with age, and there is a need to make sure levels are not below what they should be, hence there is probably wisdom in seeking natural protocols.

1. Let's take a look at the first overlooked cause: excess estrogen exposure in the environment, specifically the water. NBC's Tom Costello reported on researchers who discovered male fish in the Boulder River in Colorado that have developed female sexual organs because of too much estrogen in the water. That first report was in 2004, and it reminded me of a report in my nutritional newsletter, Nutri-Notes (1995), on second-hand drugs in the water (including treated water and rivers), where they had discovered lipid-lowering drugs, antibiotics, analgesics, antiseptics, beta-blockers (heart drugs), epilepsy drugs, and contrast agents for diagnostic x-rays, along with estradiol that was believed to be derived at least in part from excreted birth control pills and hormone replacement. As Harvard Health Publications (2011) points out, sewage treatment plants are not currently designed to remove pharmaceuticals from the water.

Since these discoveries of excess estrogen and estrogen-like compounds (known as mimickers or xenoestrogens) in our waters (not to mention the other pharmaceuticals that wind up there), various researchers have blamed these estrogen mimickers for the surging incidences of hormonal imbalance problems in both men and women, including low testosterone. Government researchers found natural estrogens and estrogen mimickers in 80% of the streams they tested in 30 states. Many chemical breakdown products can mimic estrogen, including compounds from paint, rubber, detergents, soaps, etc. BPA, or bisphenyl-A, from plastic is one of the biggest offenders; if you heat it or freeze it, it increases exposure.

Support: What can you do for natural support when it comes to this first overlooked cause? Choosing a safe, healthy detox program is a good step. Choosing supplements that help mobilize, bind, and remove estrogen are helpful, including fish oil, N-acetylcysteine (raises glutathione), fiber, antioxidants, chlorella, greens, etc. Organic vegetables, especially dark-colored ones and the cruciferous vegetables, are high in the ingredients that will accelerate the detoxification of xenoestrogens and pharmaceutical residues.

2. A second overlooked cause for low testosterone would be excess estrogen circulating in the body because it is not being removed properly. Beta-glucuronidase is an enzyme responsible for breaking up and releasing estrogen into the system after it has already been conjugated and marked for removal (not a good thing).

Support: What support is available for this second overlooked cause? Supplementation with calcium D-glucarate, the calcium salt of D-glucaric acid (found in high concentrations in cruciferous vegetables), has been shown to inhibit beta-glucuronidase, thereby allowing the normal elimination of estrogen. High levels of this enzyme are associated with unbalanced estrogen levels. Diets high in cruciferous vegetables and supplementation with calcium D-glucarate help to maintain a good balance of this enzyme, and contribute to estrogen metabolism regulation.

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A third overlooked cause for low testosterone would be high levels of the aromatase enzyme. Aromatase, or "estrogen synthase," is an enzyme that catalyzes the last steps of estrogen biosynthesis from androgens (specifically it transforms androstenedione to estrone (bad) and testosterone to estradiol, which is bad for testosterone levels). Of the three estrogens, estradiol carries the most risks, then estrone (a weak estradiol), and then there is estriol, which has some favorable characteristics. Aromatase will not only turn steroid hormones into estrogen, it preferentially turns them into the bad estrogens. Some natural ingredients have the power to affect the aromatase enzyme, help to maintain a favorable balance of estrogens, and prevent the conversion of testosterone into estrogen.

Nutritional Protocols: What support is available for this third overlooked cause? The biggest nutrient that affects aromatase is known as DIM (diindolylmethane), found as a breakdown product of cruciferous vegetables. Besides having a favorable effect on aromatase, DIM also facilitates clearance of oxidizing metabolites and estrogenic compounds in the liver. Additionally, research is showing that unmetabolized estrogen accumulates in prostate tissue in men as they age. Exposure of human prostate tissue to unmetabolized estrogen in the laboratory resulted in activation and increased production of prostate specific antigen protein. Supplemental DIM reduces the effects of unmetabolized estrogen and promotes the action of testosterone. It does this by maximizing the testosterone-to-estrogen ratio in the body, thus increasing the activity of testosterone.

Fat cells contain aromatase, and they are the primary source for estrogen in men and postmenopausal women. After testosterone converts to estrogen naturally, it then breaks down into "bad" and "good" estrogen metabolites. DIM will improve this ratio by helping the body eliminate the bad estrogens and bad estrogenic metabolites.

For clarification following is a brief overview of the different estrogens and their metabolites, which are measured in the lab to get an idea of hormonal balance.

The Lowdown on Estrogens: E1 (Estrone), E2 (Estradiol), and E3 (Estriol)

Estrone (E1) is not considered a "good" estrogen. It is derived mostly from stored body fat and is similar to estradiol, but much weaker.

Estradiol (E2) is the strongest estrogen believed to be responsible for most of the side effects and risk factors, as well as many of the benefits that are attributed to estrogen. Estradiol is made in the ovaries and is the principal estrogen found in a woman's body during the reproductive years. Because of the down side of estradiol, it is not considered to be the best estrogen; functional health focuses on achieving a balance of estradiol (and estrone) with the "good" estrogen, E3 (Estriol).

Estriol (E3) is considered the "good" estrogen; estriol is much weaker than estradiol and, in fact, is the weakest of the three major estrogens. Estriol is the estrogen that is made in large quantities during pregnancy and has potential health properties. Estriol derives a lot of its benefit from blocking estrone (for instance, occupying the estrogen receptor sites on the breast cells) and for helping to achieve good ratios of the three estrogens, as well as good ratios of the metabolites of the estrogens. Many people believe that relatively higher levels of estriol should be sought after, and that the higher levels are beneficial for achieving an optimal health profile (especially concerning hormone balance) while providing some of the symptomatic benefits as well.

Bottom Line for Type of Estrogen: You want a healthy balance of estriol without an overload of either estradiol or estrone.

The Estrogen By-Products or Metabolites:

The other critical factor needing to be in balance is the metabolite ratio metabolites of the different estrogens. The hydroxyestrones or methoxyestrones are metabolites of these estrogens (which, for simplicity, will just be referred to by their prefaced numbers— biochemically they are 2, 4, and 16). Research has determined that the ratios of these different numbers determine a certain health profile. Not to oversimplify, but 2 is referred to as a good metabolite; 16 is not so good; and 4 depends on whether it's methoxy (good) or hydroxy (not as good). High levels of 4-hydroxyestrone can cause issues, so low levels of 4-hydroxyestrone are best.

The ratio of one metabolite over the other represents the relative dominance of one pathway over the other and is believed to be modifiable by diet. The main ratio is represented as the 2/16 ratio. It has been hypothesized that women who have a higher estrogen metabolite ratio (high 2/16) tend to be healthier.

Bottom Line for Type of Metabolite: You want a higher number for 2 and a lower number of 16, and a higher ratio