

Estrogenization of Man: Is Today's Man Becoming the New Woman?

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Modern man, like bathroom tissue, is valued for not only being strong, but also ultra soft and extra pliable.

The John Wayne machismo has been transformed into Brokeback Mountain.

In 2004, Arnold Schwarzenegger accused his opponents as being "girly-men."

Testosterone levels have declined every year for the past four to five decades.¹

Male sperm counts have dropped as much as 50% in the last 30-40 years.²

Erectile dysfunction affects 38.7% of males aged ≥ 45 .³

Prostate cancer rates have soared over the last 25 years.⁴

As women seek lasting beauty and career advancement through breast enhancements, fuller lips, bio-identical hormone replacement, cosmetic surgery and botox injections, men are ostracized for any measure that will boost sports performance, improve virility or physical appearance. Professional athletes, for example, taking legal testosterone precursors may be asked to testify in front of the United States Congress and often are publicly branded as cheaters and poor role models.

While women are suffering from estrogen dominance, men are beset with declining testosterone levels. In fact, at the 2007 Summit on Environmental Challenges to Reproductive Health, it was reported that there is a worldwide decline of testosterone of one percent every year over the past 40-50 years. Furthermore, it has been revealed that testicular cancer now affects approximately one percent of European males who also have a one in six chance of having their sperm counts low enough to be considered infertile.⁵ This phenomenon, without surprise, is significantly more prevalent in urban areas than in areas considered rural.

Key Points

- Low testosterone is a greatly underestimated condition
- There needs to be an increased awareness among medical and health practitioners
- Men with low testosterone experience a wide array of symptomatology
- Low testosterone levels are associated with increased risk of morbidity and mortality
- There are pharmacological and natural therapies which may enhance recharge vitality, enhance testosterone levels and overall health

Introduction

Historically, clinicians have regarded testosterone primarily as a sex hormone, whereas its decline culminates in erectile dysfunction and a waning of sexual interest. However, recent research has demonstrated that testosterone has important physiologic effects, in particular, on metabolism, bone and muscle integrity, the cardiovascular system, the brain and nervous system. Presently, in addition to lack of sexual interest, infertility and/or dysfunction, there is significant research to indicate that a testosterone deficiency may also contribute to:

- Reduced insulin resistance and reduced carbohydrate metabolism
- Increased skeletal demineralization and bone porosity
- Loss of muscle mass
- Impaired cognitive function
- Reduced motivation and drive
- Loss of vitality, heightened fatigue, lethargy and depression

Lowered male testosterone or male hypogonadism is incredibly common. Testosterone levels start declining around age 35 years of age. According to Abraham Morgentaler, M.D., clinical professor at Harvard Medical School, 50% of men in their 70s will experience profound symptoms associated with clinically low testosterone levels.⁶ While, however, it has been a recognized medical condition for decades, rarely diagnosed by clinicians. Hence, few doctors offer any recommendations or treatment. Part of the problem has been the lack of clear guidelines about diagnosis and treatment protocols. For the average male who has lost his “luster,” doctors are recommending anything from Viagra to anti-depressants. It is a rare physician, indeed, who is testing for and treating low androgen levels.

There are several reasons why hypogonadism is under diagnosed:

1. Patients may feel embarrassed to discuss their symptoms with their doctors because of the sexual nature or the feeling that the symptoms they are experiencing are merely a consequence of “normal aging.”

2. Patients may be presenting to their doctors a set of non-specific symptoms such as fatigue, lack of motivation, anxiety or depression.
3. These symptoms may be perceived by the doctors as other manifestations other than low testosterone and are treated as separate issues.
4. Low testosterone is often difficult for the average physician to interpret, thus most physicians rarely test for it.
5. The general paradigm in medicine is to treat symptoms not the cause.

Research conducted at Ghent University Hospital in Belgium and reported in a 2008 issue of *Clinical Endocrinology & Metabolism*, found that bodyfat percentage and circulating levels of testosterone are partly controlled by the same genes.⁷ The objective of the study was to determine the effect of declining testosterone levels on body composition. The findings were that low levels of testosterone can lead to significant reductions in the quality of life, as well as disharmony between marriage partners. It may lead to lethargy, fatigue, malaise, loss of muscle mass, a feeling of weakness, drop in HDL levels, increased LDL, increased body fat percentage, depression and decline in libido and sexual performance.

So what's behind this loss of masculinity?

The answers are complex, but certainly include some or of the following:

- Lack of exercise
- Poor diet
- Obesity
- Insulin resistance
- Environmental toxins (hormone disruption)
- Food sensitivities
- Exposure to synthetic hormones
- Alcohol consumption
- Recreational drug use
- Certain medications (statins, anti-fungals, steroids)
- Infectious disease
- Radiation exposure
- Chemotherapy
- Testicular trauma
- Systemic disease
- Heavy metal toxicity
- Genetic predisposition
- Organ failure or insufficiency (liver, kidney, thyroid, adrenal)
- Inability to cope with stress
- Gastrointestinal diseases
- Blood sugar dysregulation
- Circulatory or cardiac disease (hypertension, CHF)
- Pulmonary insufficiency (asthma, COPD)

Clinical Physiology of Testosterone

The testes, the major male reproductive organ, secrete several male hormones which are collectively called androgens. This group includes: testosterone, dihydrotestosterone and androstenedione. The testes produce between five and seven mg per day of testosterone, by far the most dominant male hormone, accounting for about 95% of a healthy adult male's production. The balance is produced from dehydroepiandrosterone (DHEA), a precursor of testosterone, in the zona reticularis of the adrenal cortex.

The stimulus for this production originates in the hypothalamic-pituitary axis, where gonadotropin-releasing hormone (GnRH) from the hypothalamus stimulates the release of two hormones, luteinizing hormone (LH) and follicle-stimulating hormone (FSH), in the pituitary gland. LH drives the production of testosterone in the testes while FSH affects spermatogenesis.

Testosterone is abundantly produced during puberty and is responsible for the profound benefits throughout the body such as:

- Promotion of libido and aggressiveness
- Stimulation of the growth and repair of muscles
- Supports the function of the heart
- Supports and reinforces the immune system
- Assists in the building of muscle, skin and bone
- Stimulation of the production of sperm
- Nourishes the male urinary and reproductive systems
- Regulation of the production of prostaglandin with controls the growth of the prostate
- Protects against neurodegenerative diseases⁸
- May mitigate depressive disorders⁹

As with all sex hormones, testosterone is a derivative of cholesterol (figure 1). Pregnenolone, the so-called "master hormone" is the first metabolite produced directly from cholesterol. Pregnenolone is also the precursor of DHEA, the most abundant steroid hormone in the human bloodstream. While DHEA is only a mild androgen, it is the precursor for androstenedione and androstenediol, which are both precursors of testosterone (and its metabolites) as well as estrogen and estrone (and its metabolites). Deficits in either the supply of DHEA or the efficiency of the enzymatic conversion of DHEA to the sex hormones can have a deleterious effect on the production of these sex hormone-dependent systems.

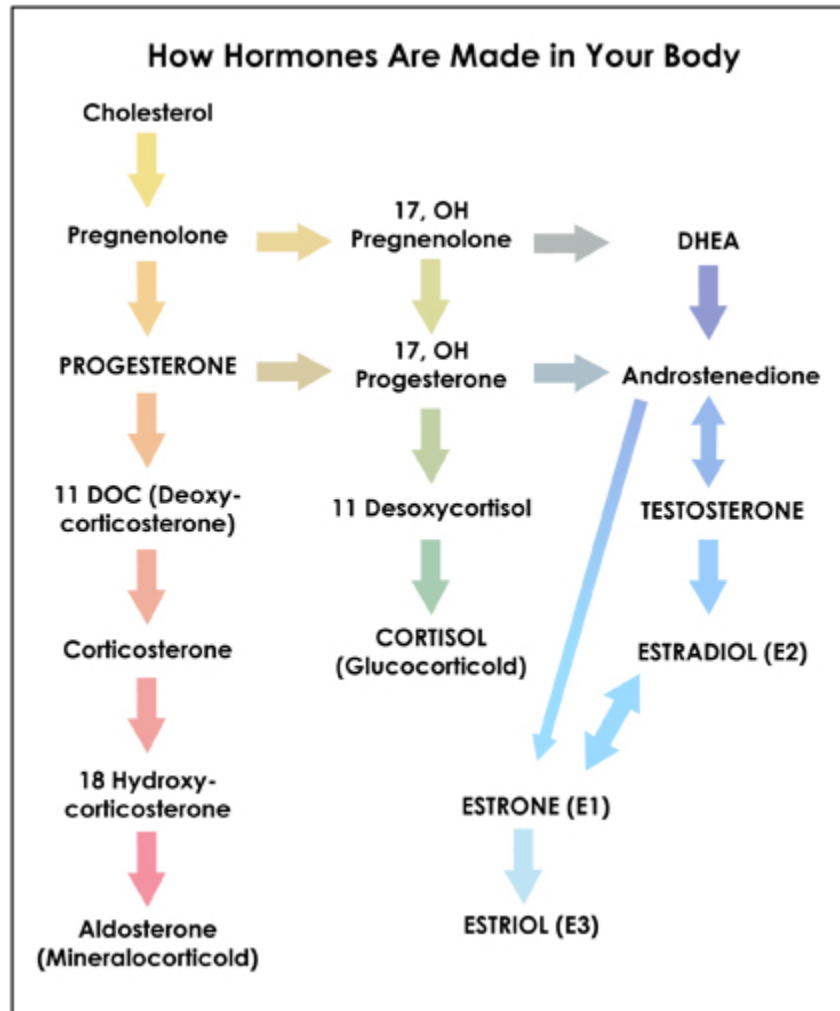


Figure 1

The Aging Male

As men age, changes often occur that may reduce testosterone levels in the body, altering the balance between testosterone and estrogen. This condition is referred to as partial androgen deficiency of aging men.¹⁰

The key factor that affects testosterone decline in aging males is an enzyme called aromatase. Found primarily in fat tissue, aromatase is responsible for the conversion of testosterone to estrogen, thus altering the ratio of the testosterone/estrogen ratio. As men age, their percentage of body fat increases with a commensurate decline of lean muscle. This loss of muscle mass is referred to as sarcopenia which is often a consequence of physical inactivity.

Inactivity may also play a role, contributing to other factors affecting aging muscle mass, including:

- Neuromuscular realignment (changes in motor units and innervation of fibers)
- Reduction in growth factors
- Changes in muscle protein turnover

The androgenic consequences of sarcopenia can be extensive; impairment in body temperature regulation, metabolic decline, glucose dysregulation and an overall loss in the ability to perform everyday tasks, which would perpetuate the sarcopenic downward cascade. A gradual loss in muscle is consistently found with advancing age; by age 50, about ten percent of muscle area is gone. After 50 years of age, the rate of accelerates significantly. According to the American College of Sports Medicine (ACSM), the average male in the United States loses about 15 percent muscle density per decade in their sixties and seventies and by about 30 percent thereafter. This juxtaposition of body composition is a breeding ground for increased production of estradiol, while testosterone levels continue to wane.

Obese males, especially those with a profound layer of visceral adipose, are most likely culprits of increased estrogen caused by aromatase and commensurate declines in testosterone. This increased estrogenization is linked to the aforementioned disorders.

“This relationship between low testosterone and obesity has been described as the hypogonadal/obesity cycle. In this cycle, a low testosterone level leads to an increase in abdominal fat, which leads to increased aromatase activity, which leads to further conversion of testosterone to estradiol, which further reduces testosterone and increases the tendency toward abdominal fat.”¹¹

Seventy to 80 percent of the body’s testosterone is bound to specialized carrier proteins – sex hormone binding globulin (SHBG). Another 20 percent is bound to albumin. Testosterone bound to carrier molecules is inactive, so only the one to three percent of the free (unbound) testosterone is biologically available and active at the receptor sites of the testosterone target cells. As we age, the amounts of this active testosterone may decline considerably, which contributes to significant regressions as men reach middle age and beyond.

The Massachusetts Males Aging Study, conducted at the New England Research Institute in Watertown, MA (1987-2004), found that, generally, healthy men experience declines of 1.2 percent every year between the ages of 39 and 70.¹² Nutritional status and the levels of the other hormones are among the factors that may determine levels of SHBG.

However, It's Not All About Aging

“During the course of normal male development testosterone from the male testes is converted within certain regions of the brain to estrogen. Estrogen then interacts with receptors on nerves to produce the cellular events that lead to masculine development. Thus, men can't become men without estrogen, but too much estrogen will have the opposite effect and cause demasculinization.”¹³

There is considerable evidence that exposure to the thousands of toxic chemicals are causing a decline in testosterone levels in men. These synthetic substances are either estrogens or estrogen mimics, are disrupting the delicate androgen/estrogen balance to historic proportions. Some of these environmental pollutants also have been found to bind free testosterone and interfere with its natural production. This is, not only affecting younger males, but impacting the males in the womb prior to birth. Considered primary hypogonadism, in utero associated retardation and infertility may be a manifestation of genetic mutations that interfere with the signaling of gonadotropic hormones or their interactions with those receptors.¹⁴

“Each year men in the industrialized world are contracting hormone-related cancers of the testicles and prostate, birth defects, lower sperm counts, lowered sperm quality and undescended testicles.”¹⁵

Researchers have found that the shifts in male androgen levels and ratios that the world is now experiencing are the probable consequence of the hundreds of synthetically produced estrogenic chemicals or mimics and androgen antagonists that, seemingly, directly deactivate androgens in our bodies.¹⁶ Over the last 60 years, there has been an unprecedented proliferation in the use of toxic chemicals (industrial, agrochemical and pharmaceutical) and the commensurate incidence of male sexual dysfunction, impotence and decline in virility.

Estrogenic Pollutants

Entering our soils, water and atmosphere are millions of tons of pharmaceutical-quality steroid drugs. This group includes bovine growth hormones used in animal feed, birth control pills, hormone replacement therapies, Premarin, prednisone and other steroidal chemicals. While deemed safe, the perceived levels of pharmaceutical products in our environment are compounded by the multiple drugs and atmospheric pollutants creating an ecological disaster. It was once believed that these microscopic toxins were within safe limits, but today it is acknowledged that even ten parts per million are ecologically relevant and may significantly alter hormone levels and contribute to the increase in feminized males.¹⁷

Noxious Chemicals

Millions of tons of estrogen mimics, such as dichlorodiphenyltrichloroethane (DDT), organochlorines, polychlorinated biphenyls (PCBs) and their metabolites are very active estrogen mimics and are ubiquitous throughout the world. Used as pesticides on farms throughout the world, these chemicals have been found to be powerful androgen antagonists, interfering with male androgen balances.

The common pesticide vinclozolin, used on cucumbers, grapes, lettuce, onions, bell peppers, raspberries, strawberries and tomatoes, is a powerful androgen antagonist. One of the metabolites of vinclozolin has been found to be 100 times more powerful than vinclozolin and is now being investigated as a possible male contraceptive.¹⁸

Other fungicides are so potent that they can inhibit all hormone production. Pyrimidine carbinol, a systemic fungicide, is “known to block the synthesis of sterols, including cholesterol, from which all steroid hormones are made.”¹⁹

Just One Word, Ben...”Plastics!”

In the 1967 movie “The Graduate,” Mr. McGuire (Walter Brooke) gives Ben Braddock (Dustin Hoffman) one word of advice after his college graduation party...”Plastics.”

What could be more benign than our bottle of Poland Springs water? People generally assume that bottled water is safer than tap. Many people, however, don't know that most plastics are made from petroleum and that plastics can contain many toxic chemicals, such as phthalates and bisphenol A, that may build up in our bodies contributing to a myriad of health problems.

“Production of normal sperm has been declining dramatically in developed countries over the last half century: sperm count dropped an average of 42% from 1940 to 1990 along with significant decreases in sperm motility and the number of morphologically normal sperm.”²⁰ Given that there has been a parallel rise in the incidence of other abnormalities of male reproductive health (such as testicular cancer, undescended testes and hypospadias, (the abnormal location of the urethra on the penis), experts are postulating that fetal or childhood exposure to environmental estrogenic or anti-androgenic compounds (including phthalates and bisphenol-A) or other hormone disruptors produces a "Testicular Dysfunction Syndrome" that links all of these abnormalities.²¹ If this is true, it will be at least two decades before the impact of current levels of environmental estrogens will be manifest in males born today.

In a study of men who had attended an infertility clinic in the Boston area, those with higher urinary levels of certain phthalates exhibited sperm abnormalities, including decreased sperm count and motility and increased damage to sperm DNA.²² In another study, performed in India, phthalates have been found in the semen of infertile men in which sperm abnormalities correlated significantly with the level of phthalates present.²³

Common Sources of Phthalates

Phthalates, or “plasticizers,” are a group of chemicals used to make plastics like polyvinyl chloride (PVC) more flexible and resilient. They’re one of the most insidious of the endocrine disrupters.

Phthalates are found in, among other things:

- Processed food packaging and plastic bottles
- Hoses
- Raincoats and other outerwear garments
- Shower curtains
- Vinyl flooring and wall coverings
- Lubricants and adhesives
- Detergents
- Beauty products like nail polish, hair spray, shampoo, deodorants, and fragrances
- Toys, plastic utensils, ornaments and other plasticized items

Is There a Natural Solution? Maybe!

One can substantiate any hypothesis using the scientific method. With virtually any therapeutic approach there are studies that will confirm or deny the existence of “proof” of efficacy or denial.

According to Abraham Morgentaler, M.D., associate clinical professor at Harvard Medical School, “there isn’t a shred of evidence that supplements and natural therapies offer any help for men with low testosterone.”²⁴ Morgentaler goes on to state that because these natural agents are not approved by the Food and Drug Association (FDA) and do not require prescriptions is because they have little, if any, important effects on any medical condition such as low testosterone. He believes that if a supplement or natural remedy really increased testosterone levels substantially, it would be critical for the FDA to regulate it.^{IBID}

The only natural agent, Morgentaler claims, to possibly offer some benefit is DHEA, but verifiable evidence is lacking as to its merit to substantially raise testosterone levels.

From a conventional perspective, treatment for hypogonadism is simple and straight forward. Pharmacological administration will depend upon laboratory reference ranges. Normal morning fasting levels of testosterone concentration in adult males range between 8 and 35 nmol/l. Testosterone levels follow a circadian rhythm with a variance of 20 to 40% between morning peaks and bedtime. It is most desirable to draw samples between 7:00 a.m. and 11:00 a.m. Optimally repeat samples, during treatment phases, should be consistent so that changes in circadian levels may be mitigated.

Several treatment options are available with a selection of different delivery systems. The formulation can be chosen to suit the individual patient's needs, thresholds or constraints without compromising treatment efficacy and safety.

Administration may be transdermal (gels, creams or patches), oral (capsules or sublingual) or intramuscular (by injection). Testosterone gels comprise the most common form of treatment in the United States, accounting for about 60 percent of the testosterone market.²⁴ These are generally applied once daily in the prescribed amount onto the upper arms and shoulders. The controversy is whether this preparation should be bio-identical or synthetic. The answer is contingent upon who is answering the question. Bio-identical hormones are, generally, chemically altered in a laboratory from either soy or diosgenin (a derivative from wild yam) or both. Dispensed by a compounding pharmacist, they are marketed as a safer modality because it more accurately mimics the effects of naturally produced hormones.

The controversy is that since bio-identical hormones are not regulated through the FDA, there's no consistency in its manufacturing and, hence may differ from batch to batch, whereas an approved synthetic pharmacological preparation needs to conform to standards in dosage, bio-availability and good manufacturing practices (GMP). According to Dr. Morgentaler, "there is no way a local pharmacist can do this."

As with all synthetic pharmaceuticals, the natural testosterone molecule is altered just enough (for the purpose of being longer lasting, more absorbable and more potent) so that the formulation can be patentable. What the drug companies basically do is attach on an extra molecule to the testosterone molecule. As with

virtually all drugs, the human body takes what it knows from its long evolutionary span (in this case testosterone), separates it from any alien molecular structures, uses what it can naturally process, and is left with the problem of getting rid of the remaining foreign elements. These leftover molecular fragments are often processed in the liver and are the source of the toxicity associated with anabolic steroids. As Jonathan Wright, M.D., coauthor of *Maximize Your Vitality and Potency for Men Over 40*, comments: "Call them what you will, hormone-like drugs are most definitely not hormones, and they never work exactly like natural hormones."²⁵

With the passage of the Anabolic Steroid Control Act of 2004, signed into law by President George Bush, all steroids, steroid precursors and nearly all natural prohormone supplements were banned from the marketplace if they were found to be structurally related to or had effects like that of testosterone. This law was prompted by the outcry over steroid hormones used to enhance sports performance, additionally, this law was supposedly enacted to protect children from purchasing them despite a stellar safety record.

Confused Yet?...What are the Natural Alternatives?

The following supplements have some efficacy in its ability to increase testosterone levels:

Pregnenolone

Pregnenolone is produced from cholesterol in the mitochondria, thus, it is a primary steroid hormone (in both men and women). Pregnenolone is considered the base material of which all human steroids are manufactured, including DHEA, cortisol, progesterone, testosterone and the estrogens (see figure 1 on page 5).

Although much of the benefit of pregnenolone is based on anecdotal evidence, it does seem to enhance cognitive function, which often becomes impaired with declining testosterone levels. In the 1940s, some researchers started experimenting with the use of pregnenolone. It was determined that it could be helpful for treating collagen diseases such as rheumatoid arthritis, lupus, scleroderma and ankylosing spondylitis. It was also useful for treating those individuals under stress as it could increase energy in those who were fatigued.

At about the same time, however, cortisol was discovered. Cortisol stole the limelight. When cortisol was given to individuals with rheumatoid arthritis, there were outstanding short-term improvements. Photographs of these remarkable recoveries were circulated and the medical community was impressed. Scientists basically put pregnenolone aside to focus on cortisol.²⁶

There have only been few studies published on pregnenolone in recent years and only a couple involving human subjects in the medical literature regarding any benefits of pregnenolone.

Some people have found pregnenolone to improve energy, vision, memory, clarity of thinking, wellbeing, and often sexual enjoyment or libido. Pregnenolone has been touted, in some promotional Websites, of decreasing pain, yielding more mobility and reducing stiffness (a search through the PubMed files have failed to reveal any substantiation of these alleged clinical studies).

Possible side effects may include hyperalertness, irritability, anger or anxiety. Acne may occur due to the probable conversion of this hormone into androgens. Headaches are possible with high dosages and possible scalp hair loss if used daily for prolonged periods.

Suggested dosages are typically between five to 50 milligrams per day.

Dehydroepiandrosterone (DHEA)

DHEA has been studied intensely for the last ten to 20 years. The Amazon.com Website reveals 5,926 books that refer to DHEA. While DHEA is considered a mild androgen, it is the precursor for androstenedione and androstenediol (both banned as a result of the 2004 Anabolic Steroid Control Act) which are the precursors of testosterone, making it essential for testosterone production. DHEA is the most abundant steroid hormone in the blood and has demonstrated a significant amount of positive health benefits including: reversing weight gain, increasing strength, endurance, cognitive function and overall energy levels. More specifically, however, DHEA is used to treat hypercortisolemia as it is an antagonist to cortisol.

DHEA levels are higher in males than females and two-thirds of men experience declining levels with aging (in one-third of adults DHEA levels will increase with age²⁷). Because DHEA supplementation, theoretically, can enhance production of the estrogens estrone and estradiol, many clinicians feel that DHEA supplementation is a potential problem when used as androgen replacement therapy. I, however, have not been able to locate any substantiation to this phenomenon.

In a 1999 study of older men ≥ 50 , reported in the *Journal of Applied Physiology*, daily ingestion of 50 and 100 mg of DHEA has been reported to increase the serum androstenedione concentrations by 20 and 100%, respectively. In the only published report on the serum androstenedione response to DHEA supplementation in young men, ingestion of 1,600 mg DHEA/day produced a

100% increase in serum androstenedione concentration with no increased levels of estrogen.²⁸

DHEA supplementation is contraindicated with individuals with increased prostate-specific antigen (PSA) levels and bi-polar depression, as it may exacerbate the mania stage.

Suggested dosage is usually in the range of 50-100 mg daily.

Zinc

Zinc is involved in over 200 enzymatic reactions in the body including the conversion of androstenedione to testosterone. In one animal study, rats subjected to an acute swimming test were either supplemented with zinc or a placebo. The study demonstrated those who had been supplemented led to a significant increase in testosterone and commensurate improvement in swimming performance.²⁹ Among humans, zinc supplementation in a group of male wrestlers prevented the depletion of testosterone after exertion.³⁰

Additional studies have supported that daily zinc supplementation, in those individuals who have decreased levels of zinc, have increased testosterone levels, as well as a subsequent rise in DHT. Those with normal zinc and/or normal testosterone were unaffected by zinc supplementation.

Side effects will be dependent on individual zinc levels and the ratio of zinc to copper. Zinc can antagonize copper which may create iron deficiency anemia. At very high levels, excessive zinc may cause nausea, upset stomach, skin rashes, depression, folate deficiency and lowered tolerance to alcohol.

Dosage will vary between 10-50 milligrams depending on need.

Chrysin

Chrysin is considered one of the most powerful of the naturally derived aromatase inhibitors in vitro and thought to be one of the most potent inhibitors of human estrogen aromatase. Chrysin is a flavonoid derived from various plants found with high concentrations of honey. It is a popular supplement among bodybuilders because of its purported ability to inhibit the conversion of testosterone to estrogen. Clinical research, however, does not support the premise that chrysin will increase testosterone levels. One explanation may be that in vivo it is not well absorbed and has low oral bioavailability.

In a study published in *Biochemical Pharmacology* (1999, Vol.58), the specific mechanisms of chrysin's poor absorbability were identified. The study further inferred that the addition of piperine, an alkaloid and an extract of black pepper, added to the chrysin, it could significantly enhance the bioavailability of chrysin alone. Pilot studies have found piperine to be a catalyst in up-regulating absorption. By adding it to a formula containing chrysin, the rate of utilization is greatly increased. Two recent studies have identified specific mechanisms in how chrysin does its job. These studies demonstrate that chrysin is more potent than other flavonoids such as genistein, rutin and tea catechins (*Archives of Pharmaceutical Research* 1999 Jun;22(3):309-12; and *Journal of Steroid Biochemistry & Molecular Biology* 1997 Apr;61(3-6):107-15). Flavonoids such as chrysin are of considerable interest as its potential effect in helping aging men restore loss of virility has tremendous potential for natural effects.

There is no evidence of side effects related to chrysin supplementation. The recommended dosage is in the area of about 1500 milligram daily, augmented with 10 milligrams of piperine.

Chrysin is also now available as a topical cream that is intended to bypass the digestive system.

Nettle Root (*Urtica dioica*)

Nettle contains a vast number of powerful chemical constituents, as well as an impressive array of vitamins and minerals. Most importantly are the lignans of nettle root which have an affinity for binding to globulin. This affinity may contribute to the beneficial effects of nettle root in the treatment of benign prostate hypertrophy (BPH).³¹ Nettle and its metabolites possesses the ability to raise testosterone levels because of its ability to inhibit the binding of dihydrotestosterone (DHT) to sex hormone binding globulin (SHBG), which has been demonstrated in human clinical trials, thus keeping body levels of androgens higher.^{ibid} Nettle root also possesses strong antiaromatase action, thus interfering with the conversion of testosterone to estradiol.

In 2005, a randomized, double-blind, placebo-controlled crossover study was conducted to determine the efficacy of nettle root extract in treating prostate symptoms. Nearly 600 men were enrolled in this 18-month trial. At the end of the study, 81 percent of the treated patients experienced significant relief of symptoms and significant reductions in their international prostate symptom score (IPSS) compared with only 16 percent in the control group. After the 18-month follow-up, only those patients who continued with the therapy experienced any benefits.³²

Nettle root is, generally, combined in formulas with other herbs such as: saw palmetto, white sage, collinsonia and/or pygeum africanum.

Mild side effects have occasionally been reported including digestive upset, skin rashes and mild swelling. There is a slight possibility that nettle may decrease the effects of anticoagulants.

The tincture dose ranges from 30-60 drops t.i.d.

Tribulus (Tribulus terrestris)

Tribulus has been used, historically, as a tonifying herb for treating impotence. Tribulus is thought to increase testosterone levels indirectly by raising leutinizing hormone (LH) leading to increases in testosterone. Anecdotal evidence and animal studies have consistently revealed a heightened sexual drive in men using the herb.³³ Overall it is believed that Tribulus is a useful herb for increasing testosterone and rebalancing the androgen to estrogen ratio.

There are minimal human studies that substantiate the efficacy of Tribulus to elevate testosterone levels. While this herb has some promise as an agent to increase libido and possibly androgen levels, more research is needed to confirm these beliefs.

The problem with studies that purport to analyze the enhancement of libido is that very few (if any) tested interventions have had success in out-performing that of the placebo.

There are no known side effects or contraindications of Tribulus. Recommended dosage ranges from 1.5 to 3 grams daily.

Muira puama

Muira puama has been used for generations by people in South America and cited in the Brazilian Pharmacopoeia. Cultivated in Brazil, the herb is still highly prized as a powerful aphrodisiac. As with tribulus, very few trials have been conducted to substantiate the claims, especially those that surmise that muira puama can reverse andropausal symptoms. The herb, however, anecdotally seems to improve sexual performance.

Exercise

While somewhat controversial, exercise alone seems to have a small and transient effect on total testosterone levels. Resistance exercise, however, in combination with a healthy diet, a low fat to muscle ratio, reduced stress levels,

restful sleep patterns and avoidance of alcohol and drugs can increase both free and total testosterone.³⁴

Antioxidants

A Chinese study examined the role of oxidative damage and its relation to decreased testosterone levels. It was found that antioxidants aid in the synthesis of testosterone at the tissue level. It was noted that antioxidants including vitamin A, vitamin E, zinc and selenium all help support testosterone production.³⁵

Conclusion

Assessing each individual case of low testosterone levels or andropause will be determined by the cause of such declines. A thorough analysis of lifestyle, diet, activity levels, environmental exposures, emotional distress, genetic factors and physiological imbalances are paramount in deciding upon an appropriate protocol.

As most cases of andropause are multi-faceted, a well-rounded holistically-oriented program is essential. This program may include diet modification, nutritional supplementation, resistance exercise, mind-body therapies, hormone replacement therapy or any combination.

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