Hormone

References

and

Bibliography
12. Testosterone in Men

Senescence in men is associated with a decline of the pituitary-testosterone axis in men.


5. Harman SM, Metter EJ, Tobin JD, Pearson J, Blackman MR; Baltimore Longitudinal Study of Aging. Longitudinal effects of aging on serum total and free testosterone levels in healthy men. Baltimore Longitudinal Study of Aging. J Clin Endocrinol Metab. 2001 Feb;86(2) 724-31 (the incidence of (over) hypogonadal testosterone levels increased to about 20% of men over 60, 30% over 70 and 50% over 80 yr of age, and even greater percentages when free T index criteria were employed)


The speed of age-related decline of serum testosterone in men


Senescence in men is associated with a decline in metabolic clearance of testosterone


Senescence in men is associated with alterations of the circadian cycle of serum testosterone levels; reduced amplitude and desynchronisation of its circadian rhythm


The age-related decline of serum testosterone starts in middle age in men


Senescence in men is associated with a loss of the circadian rhythm of serum testosterone


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Senescence in men is associated with an increased peripheral conversion of androgens into estrogens: the increased estrogen level in aging males may inhibit the androgen production

14. Drafa D, Schindler AE, Stroe E, Neacsu E. Age-related changes of plasma steroids in normal adult males. J Steroid Biochem. 1982 Dec;17(6):683-7 ("The age related changes of plasma steroids in elderly men, were suggestive of decreased testicular function with increased peripheral conversion of androgens into estrogens. ... The negative correlation between estrone and 17-OH-P (precursor of testosterone) found in elderly men, suggested that increased estrogen level in aging males may be considered able to inhibit the testicular androgen production")

Testosterone treatment may oppose and testosterone deficiency may trigger several mechanisms of senescence in men

Excessivo free radical formation: Testosterone has antioxidant activity

Testosterone and estrogens
15. Tam NN, Ghatak S, Ho SM. Sex hormone-induced alterations in the activities of antioxidant enzymes and lipid peroxidation status in the prostate of Noble rats. Prostate. 2003 Apr 1;55(1):1-8

Testosterone

Glycation: Anabolic steroids exert a protective against advanced glycation end-products

Imbalanced apoptosis: Testosterone enhances the apoptosis of Cancer cells inducedby an antioxidant

Immune deficiency: Testosterone and dihydrotestosterone may improve the immune resistance in certain conditions

Testosterone

Dihydrotestosterone
Testosterone and psychic well-being in men

Quality of life and fatigue in men: the association with lower testosterone

Lower quality of life and fatigue in men: the improvement with testosterone treatment
42. O'Connor DB, Archer J, Hair WM, Wu FC. Exogenous testosterone, aggression, and mood in eugonadal and hypogonadal men. Physiol Behav. 2002 Apr 1;75(4):557-66

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**Depression in men: the association with lower testosterone levels**
53. Werner AA. The male climacteric JAMA. 1946; 132 (4):188-94

**Depression in men: the improvement with testosterone treatment**
64. Lamar CP. Clinical endocrinology of the mate: with special reference to the male climacteric. J Fia Med Assco. 1940; 26:398-404


**Anxiety in men: the association with lower testosterone levels**

69. Werner AA. The male climacteric JAMA. 1946;132(4):188-94


**Memory loss and Alzheimer's disease in men: the association with lower testosterone levels**


74. Tan RS, Pu SJ. The andropause and memory loss: is there a link between androgen decline and dementia in the aging male? Asian J Androl. 2001 Sep; 3(3):169-74


**Memory loss and Alzheimer's disease in men: the improvement with testosterone treatment**


**Sleep disorder in men: the improvement with testosterone treatment**


**Loss of sexual drive, sensitivity and/or potency in men: the association with lower testosterone levels**

89. Younes AK. Low plasma testosterone in varicocele patients with impotence and male infertility. Arch Androl. 2000 Nov-Dec;45(3):187-95

Loss of sexual drive, sensitivity and/or potency in men: the improvement with testosterone treatment

Fertility:

Loss of fertility in men: the improvement with androgen treatment

Testosterone and physical appearance/body composition

Sarcopenia in men: the association with low testosterone levels

Reduced muscle strength development with exercise in men: the association with low testosterone levels

Sarcopenia in men: the improvement with testosterone treatment

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**Lean body mass in men: the association with lower testosterone levels**


**Lean body mass in men: the improvement with testosterone treatment**


**Testosterone and age-related diseases in men**

**Hypercholesterolemia in men: the association with lower testosterone levels**


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**Hypercholesterolemia in men: the improvement with testosterone treatment**


**Atherosclerosis in men: the association with lower testosterone levels**


**Atherosclerosis in men: the improvement with testosterone treatment**


**Arterial hypertension in men: the association with lower testosterone levels**


**Arterial hypertension in men: the improvement with testosterone treatment**


Coronary heart disease in men: the improvement with testosterone treatment

Peripheral vascular disease (including intermittent claudication) in men: the improvement with testosterone treatment

Stroke in men: the association with lower testosterone levels

Stroke in men: the improvement with testosterone treatment
153. Department of Neurology, Saint Louis University Hospital, Saint Louis, MO 63110, USA. pany@slu.edu

Obesity in men: the association with lower testosterone levels
Obesity in men: the improvement with testosterone treatment


Diabetes in men: the association with lower testosterone levels


Rheumatism in men: the association with lower testosterone levels


174. Masi AT. Incidence of rheumatoid arthritis: do the observed age-sex interaction patterns support a role of androgen-anabolic steroid deficiency in its pathogenesis? Br J Rheumatol. 1994;33:697-70


Rheumatism in men: the improvement with testosterone treatment

Osteoporosis in men: the association with lower estrogens and androgen levels


Lower testosterone levels


Osteoporosis in men: the improvement with testosterone treatment


Hip fractures in men: the association with lower testosterone levels


Cancer in men: the association with lower testosterone levels


199. Hulka BS, Hammond JE, Di Ferdinando G, Mickey DD, Fried FA, Checkoway H, Stumpf WE, Beckman WC Jr, Clark TD. Serum hormone levels among patients with prostatic carcinoma or benign prostatic hyperplasia and clinic controls. Prostate 1987; 11 (2) :171-82


Cancer mortality in men: increased risk if low testosterone levels


Cancer in men: the protection with testosterone or dihydrotestosterone treatment?


Longevity in men: the association with testosterone levels


Longevity in men: improvement of survival with testosterone treatment


Testosterone diagnosis


224. Vermeulen A, Kaufman JM. Diagnosis of hypogonadism in the aging male. Aging Male. 2002 Sep; 5(3); 170-6 ("The diagnosis of hypoandrogenism in elderly males requires both the presence of clinical symptoms and reduced (free) testosterone levels.")

Clinical testosterone evaluation in men


232. Werner AA. The male climacteric. JAMA. 1946; 132(4):188-94


235. Black AM, Day AG, Morales A. The reliability of clinical and biochemical assessment in symptomatic late-onset hypogonadism: can a case be made for a 3-month therapeutic trial? BJU Int. 2004 Nov;94(7):1066-70


Frequency of overt hypogonadism in men

238. Harman SM, Metter EJ, Tobin JD, Pearson J, Blackman MR; Baltimore Longitudinal Study of Aging. Longitudinal effects of aging on serum total and free testosterone levels in healthy men. Baltimore Longitudinal Study of Aging. J Clin Endocrinol Metab. 2001 Feb;86(2):724-31 ("the incidence of (overt) hypogonadal testosterone levels increased to about 20% of men over 60, 30% over 70 and 50% over 80 yr of age, and even greater percentages when free T Index criteria were employed")

Serum androgen tests in men


Serum FSH in men


Serum testosterone in men

244. Murray MAF, Corker CS. Levels of testosterone and luteinizing hormone in plasma samples taken at 10 minute intervals in normal men. J Clin Endocrinol Metab. 1973; 56:157

Serum dihydrotestosterone and androstanediol glucuronide in men


Serum PSA in men

252. Carter HB, Epstein JI, Chan DW, Fozard JL, Pearson JD. Recommended prostate-specific antigen testing intervals for the detection of curable prostate cancer. JAMA. 1997 May 14;277(18):1456-60


271. Callow, Nancy H. The isolation of two transformation products of testosterone from urine. Biochem J. 1939;33:559-64


300. Tokar’ VI, Gurovich AA. Mechanism of a decrease in urinary testosterone excretion in chronic fluoride Poisoning. Gig Tr Prof Zabol. 1979;(1):37-9
Urinary 7-ketosteroids in men


Corrective testosterone/androgen therapy for men


Various testosterone/androgen medications for men


Transdermal testosterone for men


Oral testosterone for men


Oral mesterolone for men


Oral testosterone undecanoate for men


**Sublingual testosterone for men**


**Intramuscular injections of testosterone enanthate or cyprionate for men**


Kenny AM, Prestwood KM, Raisz LG. Short-term effects of intramuscular and transdermal testosterone on bone turnover, prostate symptoms, cholesterol, and hematocrit in men over age 70 with low testosterone levels. Endocr Res. 2000 M ay;26(2): 153-68

**Intramuscular injections of nandrolone decanoate for men**


**Intramuscular injections of testosterone undecanoate for men**


Testosterone pellets for men


Transdermal dihydrotestosterone for men

Choi S, Kinn D, de Lingnieres B. Transdermal dihydrotestosterone therapy and its effects on patiente with microphallus. J Urol 1993; 150:657-60


Importance of reducing excessive levels of estradiol in men


Chearskul S, Charoenlarp K, Thongtang V, Nitiyanant W. Study of plasma hormones and lipids in healthy elderly Thais compared to patients with chronic diseases: diabetes mellitus, essential hypertension and corony heart disease. J Med Assoc Thai. 2000 Mar;83(3):266-77 ("Hypertensive men had the highest plasma estradiol levels")

Cengiz K, Alvur M, Dindar U. Serum creatine phosphokinase, lactic dehydrogenase, estradiol, progesterone and testosterone levels in male patients with acute myocardial infarction and unstable angina pectoris. Mater Med Pol. 1991 Jul-Sep;23(3):195-8 ("Serum estradiol levels in the patient groups were significantly higher than the control group (p < 0.001). There was a positively good correlation between the serum CPK and LDH levels in acute myocardial infarction and the serum estradiol levels. These results suggest that hyper estrogenemia may be a risk factor for myocardial infarct in middle-aged men.")

....and the Importance of avoiding too low levels of estradiol in men: risk of osteoporosis

Carisen CG, Soerensen TH, Eriksen EF. Prevalence of low serum estradiol levels in male osteoporosis. Osteoporos Int. 2000;11(8):697-701
Treatment of borderline androgen deficiencies in men


Use of youthful (young adult) male reference values

388. Vermeulen A, Kaufman JM. Diagnosis of hypogonadism in the aging male. Aging Male. 2002 Sep;5(3):170-6 ("In the absence of convincing arguments for altered requirements with age, we consider that the normal range of (free) testosterone levels in young adults is also valid for elderly.")

Testosterone/androgen treatment in men: dosages


Testosterone/androgen treatment in men: safety, adverse effects, complications


Follow-up of testosterone/androgen treatment in men: judging the efficacy of the androgen replacement by monitoring the patient's clinical and laboratory test responses


TOPICS OF DISCUSSION:

TESTOSTERONE TREATMENT AND TESTICULAR SUPPRESSION

Full recovery of testosterone (endogenous) secretion and serum levels after stopping high dose testosterone-progestogen treatment for contraception

Full recovery of testosterone production to youthful (young adult) levels in old animals after long-term suppression of endogenous testosterone secretion by high doses of exogenous testosterone (Leydig cell aging was prevented by the high doses of testosterone treatment)
Up to 14.5 weeks for recovery of normal sperm production after treatment with high doses of testosterone-progestogen used for contraception (sperm suppression)

TESTOSTERONE TREATMENT AND PROSTATE CANCER

Prostate Cancer: epidemiology

On the important annual incidence of (detected) prostate Cancer in men who are alive in the United States

On the very high incidence of prostate Cancer when biopsies are made in men aged 62 or over, even with low serum PSA
2. Meikle AW, Stanish WM. Familial prostatic Cancer risk and low testosterone. J Clin Endocrinol Metab. 1982 Jun;54(6):1104-8 (Among the 2950 men (age range, 62 to 91 years), prostate Cancer was diagnosed in 15.2 %; 14.9 % of the prostate cancers had a Gleason score of 7 or higher. The prevalence of prostate Cancer was 6.6 % among men with a PSA level of up to 0.5 ng/ml, 10.1 % among those with values of 0.6 to 1.0 ng/ml, 17.0 % among those with values of 1.1 to 2.0 ng/ml, 23.9 % among those with values of 2.1 to 3.0 ng/ml, and 26.9 % among those with values of 3.1 to 4.0 ng/ml. The prevalence of high-grade cancers increased from 12.5 % of cancers associated with a PSA level of 0.5 ng/ml, or less to 25.0 % of cancers associated with a PSA level of 3.1 to 4.0 ng/ml. Conclusions: biopsy-detected prostate Cancer, including high-grade cancers, is not rare among men with PSA levels of 4.0 ng per milliliter or less — levels generally thought to be in the normal range.)

On the real incidence of prostate Cancer: much higher prevalence rate of prostate Cancer are found at post-mortem
3. Stemmermann GN, Nomura AM, Chyou PH, Yatani R. A prospective comparison of prostate Cancer at autopsy and as a clinical event: the Hawaii Japanese experience. Cancer Epidemiol Biomarkers Prev. 1992 Mar-Apr;1(3):189-93 ("3.6 % of men in li fe were diagnosed with prostate Cancer, whereas 27% of autopsied Hawaii Japanese men who died after 50 years of age had prostate Cancer, reaching a frequency of 63% among men over 80 years of age. The volume of 48(60%) of these cancers was less than 150 mm3. These small tumors would probably not have been discovered in a screening program. Tumors larger than 1000 mm3 would probably be discovered using modern diagnostic procedures but were found in only 13 (4.4%) of the autopsied men)
4. Oishi K, Yoshida O, Schroeder FH. The geography of prostate Cancer and its treatment in Japan. Cancer Surv. 1995;23:267-80 ("The vast majority of cases of prostate Cancer remain undetected during life, the prevalence of prostate Cancer detected at autopsy being 2800 times that of fatal Cancer in Japanese in Japan, 570 times in whites in the USA and 470 times in blacks in the USA. A case-control study of prostate Cancer carried out in Japan and the Netherlands revealed a number of statistically significant risk factors, including ...no morning erections, episodes of sexually transmitted disease, lower plasma estros fere and dihydrotestosterone concentrations.")

5. Sanchez-Chapado M, Olmedilia G, Cabeza M, Donat E, Ruiz A. Prevalence of prostate Cancer and prostatic intraepithelial neoplasia in Caucasian Mediterranean males: an autopsy study. Prostate. 2003 Feb 15;54(3):238-47 ("The prevalence of prostate Cancer (CaP) is 3.58, 8.82, 14.28, 23.80, 31.7, and 33.33% in the 3rd, 4th, 5th, 6th, 7th, and 8th decades, respectively. The rates of high-grade prosatic intraepithelial neoplasia (HG PI N) were 7.14, 11.75, 35.71, 38.06, 45.40, and 48.15% at the 3rd, 4th, 5th, and 5th decades of life...in 21/27 cases (77.7%), an association between CaP and HGPI N was found. The prevalence of both lesions in Caucasian Mediterranean males is significantly lower than in Caucasian American and Afro-American males in all the age groups evaluated.")


7. Baron E et ai. Arch Path. 1941,32:787-93


**Prostate Cancer patients have a low risk of dying from Cancer**

9. Stemmermann GN, Nomura AM, Chyou PH, Yatani R. A prospective comparison of prostate Cancer at autopsy and as a clinical event: the Hawaii Japanese experience. Cancer Epidemiol Biomarkers Prev. 1992 Mar-Apr; 1(3): 189-93. ("Prostate Cancer was diagnosed in life among 274 of 8006 (3.6%) members of a cohort of Japanese men in Hawaii between 1965 and 1990. Only 55 (20%) of the 274 diagnosed cases died with prostate Cancer, and they accounted for only 2% of the 2893 deaths that occurred among the men during this period.")


**Prostate Cancer, esp. non-metasized is rarely a cause of death in men**


**Side effects of testosterone/androgen deprivation therapy of prostate Cancer**

*Androgen deprivation therapy may severely impair the quality of life*

13. Dacal K, Sereika SM, Greenspan SL. Quality of life in prostate Cancer patients taking androgen deprivation therapy. J Am Geriatr Soc. 2006 Jan;54(1):85-90 ("Participants receiving androgen deprivation therapy (ADT) reported significantly poorer quality of life in the areas of physical function (P<.001), general health (P<.001), and physical health component summary (P<.001) than men not receiving ADT; After controlling for comorbidity, total testosterone level rather than ADT accounted for a small yet statistically significant percentage of the total variance of the physical health..")

14. Chen AC, Petrylak DP. Complications of androgen-deprivation therapy in men with prostate Cancer. Curr Urol Rep. 2005 May;6(3):210-6 ("Androgen-deprivation therapy (ADT) is indicated for the treatment of metastatic prostate Cancer and locally advanced disease. In addition to sexual side effects, long-term ADT results in several of her changes, including hot flashes; gynecomastia; changes in body composition, metabolism, and the cardiovascular system; osteoporosis; anemia; psychiatric and cognitive problems; and fatigue and diminished quality of life.")
Androgen deprivation causes anemia

Androgen deprivation causes impotence

Androgen deprivation therapy may cause urinary incontinence

Androgen deprivation therapy generates a greater rate of bone loss in men with prostate Cancer

Testosterone deprivation therapy increases arterial stiffness in men with prostate Cancer

Dihydrotestosterone deprivation therapy increases the risk of aggressive prostate Cancer

Arguments against population-based PSA screening for prostate Cancer and against treatment of prostate Cancer:
1. High prevalence rates of prostate Cancer at postmortem
2. Increasing biopsy rates leads to overdiagnosis and overtreatment
3. Despite widespread use of such tests in the USA, and apparent incidence rates of detected prostate Cancer almost 3 times higher than in the U.K., the mortality in the USA has for many years been almost the same as in the U.K. and other European countries
4. 1/3 of screen-detected cases are incurable
5. No clear benefit of treatment
6. Side effects of prostatectomy include impotence in a large proportion of cases and incontinence in a smaller proportion
7. Screening and follow-up of treatment (much of which may be unnecessary) is expensive (high costs)
8. Few years of life to gain in many elderly patients
9. No consequent reduction in mortality has yet been demonstrated in a randomized controlled trial
ARGUMENTS PRÓ TESTOSTERONE THERAPIES

HUMAN STUDIES:

Studies where low testosterone apparently increases the risk of prostate Cancer

The urinary free testosterone decreases with aging, while the incidence of prostate Cancer increases

Low serum testosterone is associated with an increased prostate Cancer risk

Low serum testosterone levels have been found in prostate Cancer patients

do to statistical significance lower testosterone levels in prostate Cancer patients

Low testosterone levels are found in prostate Cancer patients and in their (not yet affected) relatives with familial predisposition to prostate Cancer
A high serum SHBG (and thus less bioavailable testosterone) is found in men with family history of prostate Cancer.


A high incidence of prostate Cancer is found in patients with low testosterone and normal digital rectal examination and normal PSA (<4 ng/ml).


Low serum levels of total and bio-available testosterone are found in populations with a higher risk of prostate Cancer (such as African-Americans and whites).


Studies where a low serum dihydrotestosterone (DHT) was found in prostate Cancer patients.


A study where DHT is inversely, significantly, and strongly associated with the risk of prostate Cancer.


Studies where dose to statistical significance lower DHT levels were found in prostate Cancer patients.


High grade prostate cancers are associated with low testosterone levels.


Gene polymorphisms with increased risk of high grade prostate Cancer are associated with low testosterone levels

Metastatic prostate Cancer (PC) is associated with a low serum testosterone compared to localized PC

A low serum testosterone level in patients with metastatic prostate Cancer predicts a worse response to androgen withdrawal therapy (progression to androgen-independent prostate Cancer)

Lower prostate tissue levels of DHT (but similar levels of testosterone) are found in men with recurrent prostate Cancer compared to men with benign prostate hypertrophy

Low testosterone levels are associated with an increased prostate Cancer mortality in prostate Cancer patients

A study where low testosterone levels are found in men with benign prostate hypertrophy

A study where a low androstanediol glucuronide level was found in patients with benign prostate hypertrophy

Men with chronic prostatis have of ten low testosterone
65. Yunda IF, Imshinetikaya LP. Testosterone excretion in chronic prostatitis. Andrologia. 1977 Jan-Mar;9(1):89-94 (In 73.1% of patients considerable reduction of testosterone excretion was revealed. Reduction of testicular endocrine function is in direct correlativo dependence on severity of clinical symptoms, duration of disease and form of chronic prostatitis.)
A history of prostatitis is positively associated with a history of benign prostatic hyperplasia and cancer.

66. Daniels NA, Ewing SK, Zmuda JM, Wilt TJ, Bauer DC; Osteoporotic Fractures in Men (MrOS) Research Group. Correlates and prevalence of prostatitis in a large community-based cohort of older men. Urology. 2005 Nov;66(5):964-70 (“We found positive associations for a history of prostatitis with a history of benign prostatic hyperplasia (odds ratio 8.0, 95% confidence interval 6.8 to 9.3) and a history of pró fásia Cancer (odds ratio 3.4, 95% CI: 4.4 to 6.6)"

A study where testosterone treatment at high doses prevented the prostate stromal proliferation that estradiol may induce in the presence of physiological concentrations of testosterone.


Studies where testosterone treatment appears to protect against prostate cancer.

Studies where testosterone androgen treatment of patients with advanced prostate cancer increased their survival time and quality of life.


Studies where testosterone androgen treatment inhibits the proliferation of human prostate cancer cells or induces their apoptosis in vitro.


Studies where testosterone treatment reduces prostate dysfunction complaints (dysuria, nocturia).

74. Flamm J, Kiesswetter H, Englisch M. An urodynamic study of patients with benign prostatic hypertrophy treated conservatively with phytotherapy or testosterone. Wien Klin Wochenschr 1979 Sep28;91(18):622-7

75. Kearns WM. Testosterone in the treatment of testicular deficiency and prostatic enlargement. Wisconsin Med J. 1941; 40:927 (testosterone propionate therapy did not reduce the size of the prostate, but reduced the dysuria)

76. Meltzer M. Male hormone therapy of prostatic hypertrophy. Lancet. 1939; 59: 279

77. Trasof f A. The treatment of benign prostatic hypertrophy with testosterone propionate. J Lab Clin Med.1940;25: 377

78. Markham MJ. The clinical use of peroral methyltestosterone in benign prostatic hypertrophy. Urol Cutan Rev. 1942;46:225

79. Markham MJ. The clinical use of testosterone propionate in benign prostatic hypertrophy. Urol Cutan Rev.1941;45: 35

80. Laqueur E. Behandlung der Prostathypertropie mit männlichen Hormone (Hombreol) eine experimentell Begründung dieser Therapie. Schweiz Med Wochenschr. 1934; 64:1116

Study where testosterone treatment reduces prostate stromal hyperplasia and prostatic complaints (prostatism)
82. South Med J, 1939, 32: 154

Studies where dihydrotestosterone treatment reduced the prostate volume (-15 to -20% after 1 year treatment)
85. Sitruk-Ware R. Contraception, 1989, 39: 1-191

ANIMAL STUDIES:

Studies where androgen deprivation stimulates the progression of hormone-sensitive mouse prostate Cancer cells to hormone insensitive in vitro

Studies where antiandrogens (which cause androgen deficiency) may promote DMAB-induced prostate Cancer incidence or increase its malignancy

A study where significantly lower testosterone (and androstenedione) levels are found in mice with prostate inflammation. This means that testosterone (and androstenedione) may be necessary to counter prostate inflammation.

A study where testosterone treatment may prevent benign prostate hypertrophy by inhibiting stromal proliferation-induced by estradiol and by keeping prostate glandular cells health, preventing their atrophy in vitro

A study where testosterone treatment reduces the proliferation of mouse prostate Cancer cells in vitro

A study where testosterone treatment reduces the proliferation of guinea pig prostate stroma cells in vitro

A study where testosterone treatment at high doses does not increase the incidence of prostate Cancer cells in mice
A study where testosterone, DHT and progesterone protects the prostate glandular epithelium against metaplasia and excessive stroma proliferation induced by estrogens in castrated male mice

A study where testosterone treatment of certain species of mice can inhibit prostate Cancer growth

Studies where dihydrotestosterone treatment of certain species of rats can inhibit prostate Cancer growth

A study where dihydrotestosterone treatment stimulates apoptosis of prostate Cancer cells

Breast Cancer in women: protection with testosterone or dihydrotestosterone treatment?

NEUTRAL EFFECTS OF TESTOSTERONE THERAPIES

REVIEW STUDIES where the authors did not find an adverse effect of testosterone levels or treatment on the prostate Cancer risk

Review studies with conclusions that there is no data to support the view that testosterone treatment could increase the risk of prostate Cancer, making e.g. a prostate Cancer progress from a preclinical to a clinical stage
102. Morley JE. Testosterone replacement and the physiologic aspects of aging in men. Mayo Clin Proc. 2000 Jan;75 Suppl:S83-7 (*There is no clinical evidence that the risk of either prostate Cancer or benign prostate hypertrophy increases with testosterone treatment*)
103. Rhoden NEJM 2004 (*No compelling evidence at present to suggest that men with higher testosterone levels are at greater risk of prostate Cancer or that treating men who have hypogonadism with exogenous androgens increases this risk. In fact, it should be recognized that prostate Cancer becomes more prevalent exactly at the time of a man’s life when testosterone levels decline.*)
104. Basaria S, Wahistrom JT, Dobs AS. Anabolic-Androgenic Steroid Therapy in the Treatment of Chronic Diseases. J Clin Endocrinol Metab. 2001 Nov;86(11):5108-17 (* recent reviews suggest that the incidence of prostate Cancer is not increased by testosterone administration*)
105. Moraies A. Androgen replacement therapy and prostate safety. Eur Urol 2002 Feb;41(2):113-20 (*To date there is no evidence that exogenous androgens promote development of prostate Cancer*)
106. Prehn RT. On the prevention and therapy of prostate Cancer by androgen administration. Cancer Res. 1999 Sep 1;59(17):4161-4 (*... contrary to prevalent opinion, declining rather than high levels of androgens probably contribute more to human prostate carcinogenesis and... androgen supplementation would probably lower the incidence of the disease, ... consider the possibility that the growth of androgen-independent prostate cancers might be reduced by the administration of androgens*)
STUDIES with no association between serum androgen levels and prostate disease, including Cancer

Studies with no significant difference in plasma testosterone and/or DHT and/or androstanediol glucuronide between prostate cancer patients and controls

Studies with no correlation between serum testosterone and serum PSA
114. Monda JM, Myers RP, Bostwick DG, Oesterling JE. The correlation between serum prostate-specific antigen and prostate cancer is not influenced by the serum testosterone concentration. Urology 1995 Jul;46(1):62-4

A study with no correlation between serum testosterone and prostate tumour volume, weight or Gleason score
117. Monda JM, Myers RP, Bostwick DG, Oesterling JE. The correlation between serum prostate-specific antigen and prostate cancer is not influenced by the serum testosterone concentration. Urology. 1995 Jul;46(1):62-4

A study where therapeutic androgen deprivation (blockade) has no beneficial effect on the evolution of the prostate cancer

A study with no significance: association of serum testosterone with benign prostate hyperplasia

STUDIES where testosterone/androgen treatments had no adverse effect on the risk of prostate disease, including the risk of prostate cancer

Small clinical studies, performed before the days of PSA, where androgen treatment, usually with small dosages of androgen, did not stimulate the growth of many prostatic tumors and in some cases the tumours were even inhibited by the treatment; the responses were extremely variable

Studies where testosterone treatment had no significant effect on PSA and/or prostate volume
131. Rhoden EL, Morgentaler A. Influence of demographic factors and biochemical characteristics on the prostate-specific antigen (PSA) response to testosterone replacement therapy. Int J Impot Res. 2005 Sep 22. (No statistical increase: average = 0.31 ng/ml after 1 year of treatment of hypogonadal men)

A study where dihydrotestosterone treatment had no significam: effect on serum PSA

Studies where testosterone treatment increases the serum PSA but normalizes it in patients with initial atrophic prostate bringing it up to normal levels without any excessivo increase
Testosterone treatment does not increase the incidence of prostate disease
140. Hartnell J, 72"" Endocrine Soe. Meeting, 1990, A 428

A study where previous testosterone propionate treatment (terminated 1 to 7 years before the study) did not increase the risk of prostate hypertrophy or palpable prostate irregularities in men over 45 years, whatever the treatment length or dose

Studies where DHT treatment had no effect on the prostate volume

ARGUMENTS CONTRA TESTOSTERONE THERAPIES:

Studies that suggest that testosterone may increase the prostate Cancer risk
Prostate cancer: the association with high free testosterone levels

Note: on the importance to check dietary factors:

Studies where the consumption of high amounts of protein and saturated fat such as milk products and meat increased testosterone levels
Milk or meat intake may increase the risk of prostate (in fact the increased risk may disappear if the vegetable intake which is lower in meat eaters is taken into account)

Link between meat, milk and/or protein intake, and prostate Cancer

A study where higher levels of testosterone were found in patients who are in the advanced D-stage of PC, compared to the levels found in patients in the more moderate B and C-stages of prostate Cancer

A study where a higher rate of metastasis (relapse) is found in prostate Cancer patients with testosterone > 500 ng/dl that have been locally irradiated (critic: the irradiation may change the risk)

A study where testosterone treatment increases the growth of prostate Cancer: in vitro

Studies that suggest that the simultaneous presence of high testosterone levels with high estradiol levels (and with possibly a low DHEA levels) that may promote prostate Cancer


A study where estrogens inflamed prostate tissues in the presence of testosterone


Studies that suggest that high estrogen levels alone may promote prostate Cancer

A study where a high estrone level was found in men with prostate Cancer


A study where increased urinary 16-alpha-OH-estrone and lower 2-OH-estrone metabolites are found in prostate Cancer patients (results nearly reached statistical significance)

A study where higher estradiol and estrone levels and very low testosterone concentrations were found in prostatic fluid than in serum of prostate Cancer patients

Studies where high urinary estrogens are associated with an increased rate of prostate stromal hyperplasia

A study where estrogen treatment of castrated mice caused metasplasia of prostate glandular cells

A study where anti-estrogen treatment blocked the growth of prostate Cancer in mice, although it increased testosterone levels

A study where estrogen treatment stimulate prostate stromal hyperplasia

A study where testosterone treatment at high doses prevented the prostate stromal proliferation that estradiol may Induce in the presence of physiological concentrations of testosterone
14. Recommended Books for Physicians

TEXTBOOKS OF ENDOCRINOLOGY


SENESCENCE AND HORMONES


MULTIPLE HORMONE THERAPIES


MELATONIN


GROWTH HORMONE THERAPY IN ADULTS


THYROID


CORTISOL REPLACEMENT

Francis DW Lukens. (1954). Medical Uses of Cortisone, including hydrocortisone and corticotrophin; NewYork, Ed. Blakiston Company

DHEA


PREGNENOLONE

FEMALE HORMONE REPLACEMENT THERAPY


TESTOSTERONE and/or DHEA in WOMEN

Male Hormone Therapy (1948) ed. Summit, NewJersey, Ed. Ciba

MALE HORMONE REPLACEMENT THERAPY


Recommended Books for the General Public

MULTIPLE HORMONE THERAPIES


MELATONIN


GROWTH HORMONE THERAPY in ADULTS

Ronald Klatz. Growyoung with HGH. USA, HarperColllns Publisher

THYROID

DHEA

PREGNENOLONE

CORTISOL
Eugenia Zuckerman and Julie R. Ingelfinger. Coping with Prednisolone and other cortisone-related medicines. New York, St. Martin's Griffin


TESTOSTERONE IN WOMEN:

TESTOSTERONE IN MEN