Androstanediol

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Figure 1: DHEA.jpg

Deficiency

Decreased 3alpha-androstanediol levels can be caused by a decreased activity of 5-alpha reductase. (Ertel, Akgun et al. 1989)

Acne vulgaris

One study found decreased 3 alpha-androstanediol-glucuronide in non-hirsute women with acne vulgaris. (Joura, Geusau et al. 1996)

Prostate Cancer Risk

Several studies found no relationship with the risk of prostate cancer.

"Serum concentrations of testosterone, DHT, SHBG, 3alpha-diol G, IGF-I, IGF-II, IGFBP-1, and IGFBP-3 were not associated with risk of prostate cancer." (Gill, Wilkens et al. 2010)

"No significant associations with total prostate cancer were detected for plasma total testosterone concentration ...or the other sex hormones after adjusting for SHBG. However, plasma total testosterone concentration was positively associated with low-grade disease ... and inversely associated with high-grade disease." (Platz, Leitzmann et al. 2005)

"No differences in the average concentrations of the hormones were found between prostate cancer cases and controls, with the possible exception of A-diol-g which exhibited a 5% higher mean serum concentration among cases relative to controls (ratio 1.05, 95% CI 1.00-1.11), based on 644 cases and 1048 controls. These data suggest that there are no large differences in circulating hormones between men who subsequently go on to
develop prostate cancer and those who remain free of the disease. Further research is needed to substantiate the small difference found in A-diol-g concentrations between prostate cancer cases and controls." (Eaton, Reeves et al. 1999)

"Circulating levels of DHT and AAG (androstanediol glucuronide) do not appear to be strongly related to prostate cancer risk." (Gann, Hennekens et al. 1996)

**Lower Urinary Tract Symptoms**

A recent article states "The cases had statistically significantly greater AAG (androstanediol glucuronide) and estradiol concentrations than did the controls. After multivariate adjustment, the men in the top tertile of AAG (odds ratio 2.62, 95% confidence interval 1.12 to 6.14) had a greater risk of LUTS (lower urinary tract symptoms) compared with men in the bottom two tertiles." (Rohrmann, Nelson et al. 2007)

**Benign Prostatic Hypertrophy**

A paper published back in the 1970s reports that in normal and BPH tissues "the endogenous concentrations of 3 alpha-diol, androsterone, its 3 alpha-17-keto metabolite or precursor, and 5 alpha-dihydrotestosterone (DHT), its 3-keto,17 beta-hydroxy product of precursor, by RIA after extraction and paper chromatography of the androgens from normal and hyperplastic prostate glands. The mean concentrations of 3 alpha-diol and androsterone were about one-third of normal in BPH. The mean ratio of the concentration of DHT to 3 alpha-diol was significantly higher (P less than 0.005) than normal in BPH, whereas no statistical difference was observed for the mean ratio of the tissue levels of 3 alpha-diol to androsterone in the two groups." (Meikle, Stringham et al. 1978)

**Estrogen Receptors and Prostate Cancer**

In the prostate, ER-beta is highly expressed in the epithelial compartment, where it is the prevailing isoform.

ER-beta is an anti-proliferative receptor, 3betaAdiol is an ER-beta ligand, and CYP7B1 is the enzyme that regulates ER-beta function by regulating the level of 3betaAdiol. (Weihua, Lathe et al. 2002)

5alpha-androstane-3beta,17beta-diol (3beta-Adiol) inhibits the migration of prostate cancer cell lines via ER-beta activation. (Dondi, Piccolella et al. 2010)

5alpha-androstane-3beta,17beta-diol binds to ER-beta, but not to androgen receptors. (Oliveira, Coelho et al. 2007)

5alpha-androstane-3beta,17beta-diol inhibits prostate cancer cell migration through activation of estrogen receptor beta. (Guerini, Sau et al. 2005)

**Breast Cancer Risk**

Risk of breast cancer was positively associated with levels of all androgens in serum and urine but appeared stronger for testosterone (for trend, \( P = 0.03 \)) and dehydroepiandrosterone sulfate (for trend, \( P = 0.06 \)) in serum and for testosterone (for trend, \( P = 0.001 \)) and androstanediol (for trend, \( P = 0.04 \)) in urine. The adjusted odd ratios for high versus low quartiles were 2.7 (95% confidence interval, 1.1-6.5) for serum testosterone, 2.8 (1.1-7.4) for dehydroepiandrosterone sulfate, 4.7 (1.8-12.1) for urinary testosterone, and 3.4 (1.4-8.7) for urinary androstanediol. (Secreto, Toniolo et al. 1991)

**Estrogen Receptors and Breast Cancer**

Estrogen receptor-alpha promotes breast cell proliferation, while ER-beta inhibits proliferation and prevents breast cancer development via G2 cell cycle arrest. (Paruthiyil, Parmar et al. 2004)

5alpha-androstane-3beta,17beta-diol (3betaAdiol) induces breast cancer growth via ER-alpha. 3βAdiol is a weak agonist of ER-alpha growth induction. (Sikora, Cordero et al. 2009)

**Neural Effects**

Androstanediol is a potential GABA (A) receptor-modulating neurosteroid with anticonvulsant properties and hence could act as a key neuromodulator in the central nervous system. (Reddy and Jian 2010) (Reddy 2004)
References


