

ANABOLIC STEROIDS ARE A CAUSE OF GYNECOMASTIA

To the Editor:

In his excellent review of gynecomastia, Dr. Karnath¹ identifies the peripheral conversion of androgens (testosterone and androstenedione) by aromatase to estrogens (estradiol and estrone, respectively) as a cause of gynecomastia but does not list exogenous androgens as a potential etiology. It has been widely recognized that men taking androgen replacement therapy need to be monitored for gynecomastia as a possible iatrogenic adverse effect, and that the use of androgens for their ergogenic athletic effects can also lead to gynecomastia.^{2,3} The body-building and strength athlete community is aware of this untoward side effect of surreptitious androgen use. Athletes using anabolic steroids attempt to block the conversion of their artificially high testosterone levels to estrogens by taking aromatase inhibitors; men and women athletes alike also take estrogen-receptor blockers in an attempt to further reduce the effects of the estrogens present.

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References

1. Karnath BM. Gynecomastia. *Hosp Physician* 2008;44(7):45-51.
2. Borst SE, Mulligan T. Testosterone replacement therapy for older men. *Clin Interv Aging* 2007;2:561-6.
3. Maravelias C, Dona A, Stefanidou M, Spiliopoulou C. Adverse effects of anabolic steroids in athletes. A constant threat. *Toxicol Lett* 2005;158:167-75.

In reply:

Dr. Shiber is correct that exogenous androgens are a potential etiology of gynecomastia. Anabolic steroids are synthetic derivatives of testosterone that have been modified to enhance the anabolic rather than the androgenic effects of testosterone. The androgenic effects are responsible for the development of primary sexual characteristics in males, while the anabolic effects are responsible for promoting muscle growth. All anabolic steroids possess some androgenic activity.¹ Anabolic steroids are sometimes used by athletes for performance enhancement. They are available in oral and injectable preparations and have numerous side effects. Exogenous steroid use depresses levels of luteinizing hormone and follicle-stimulating hormone, resulting in decreased production of endogenous testosterone, testicular atrophy, decreased spermatogenesis, and infertility. Psychological side effects of anabolic steroids include major mood disturbances, such as irritability, aggression, mania, and depression. Gynecomastia is a paradoxical condition that may occur in male athletes who use anabolic steroids.¹ Gynecomastia results from the peripheral conversion of androgens to estradiol and estrone, which stimulate mammary tissue.

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Reference

1. Mottram DR, George AJ. Anabolic steroids. *Baillieres Best Pract Res Clin Endocrinol Metab* 2000;14:55-69.

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