What are Anabolic-Androgenic Steroids?

Anabolic-androgenic steroids are man-made substances related to male sex hormones. These substances promote muscle growth (anabolic effects) and the development of increased masculine characteristics (androgenic effects). “Steroids” refers to the class of drugs. The proper term for these compounds is anabolic-androgenic steroids, however most people simply refer to them as anabolic steroids. For the sake of familiarity the term “anabolic” steroids will be used throughout this fact sheet.

History of Steroid Use

Anabolic steroids were developed in the 1930s primarily to treat hypogonadism, a condition in which the testes do not produce sufficient testosterone for normal growth, development, and sexual functioning. The primary medical uses of these compounds today are to treat delayed puberty, some types of impotence, and wasting of the body caused by HIV/AIDS infection or other diseases. These drugs are available legally and only by prescription and are usually 10 to 100 times lower than doses used for performance enhancement.

During the 1930’s scientists found that anabolic steroids could assist with the growth of skeletal muscle in lab animals, which led to the use of these compounds first by bodybuilders and weightlifters and then by athletes in other sports. Increasingly, evidence has shown that athletes who participate in endurance sports such as swimming, running and cycling also abuse steroids to enhance performance. Adolescents sometimes take them to improve their body image by increasing muscle and/or reducing body fat.

How are Steroids Abused?

Anabolic steroids can be taken orally, or by injection, typically in cycles of weeks or months. This is referred to as “cycling.” Cycling involves taking multiple doses of steroids over a specific period of time, stopping for a period, and then starting again. In addition, users often combine several different types of steroids to maximize their effectiveness. This is referred to as “stacking.” Steroid users also “pyramid” their doses in cycles of 6 to 12 weeks. They do this by initially starting with low doses of the drug being stacked and then slowly increase the doses. In the second half of the cycle the doses are slowly decreased to zero. The abusers believes that this allows the body to adjust to the high doses and the drug free cycle allows the body’s hormonal system time to recuperate. Anabolic steroids can also be taken transdermally by ointment preparations rubbed on the skin.

Who Uses Steroids?

The 2004 Monitoring the Future Study, an annual survey of drug abuse among adolescents across the United States, found that an average of 1.7% of 8th, 10th, and 12th graders reported anabolic steroid use. The highest use was for 12th graders at 2.5%. Little data exist on steroid abuse by adults however, it has been estimated that hundreds of thousands of people aged 18 and older abuse anabolic steroids at least once a year. Among both adolescents and adults, steroid abuse is higher among males than females. However, abuse by young women is growing.

Side-effects and Adverse Reactions

There is a wide range of adverse side effects of anabolic steroid use such as jaundice, fluid retention, headache, aching joints and muscle cramps, high blood pressure, increase in bad cholesterol and decrease in good cholesterol, blood clots, heart attacks, enlargement of the heart’s left ventricle, kidney tumors, severe acne, liver tumors, peliosis hepatitis (blood filled cysts in the liver) and cancer. There are also other side effects that are gender or age specific.

Men-shrinking of the testicles, reduced sperm count, infertility, baldness, development of breasts, increased risk of prostate cancer.
**Women**-growth of facial hair, male-pattern baldness, changes in or cessation of menstrual cycle, enlargement of the clitoris, deepened voice.

**Adolescents**-growth halted prematurely through premature skeletal maturation and accelerated puberty. This means that adolescents risk remaining short for the remainder of their lives if they take anabolic steroids before the typical adolescent growth spurt.

In addition to this, people who abuse steroids run the risk of contracting or transmitting HIV/AIDS or hepatitis B and C and bacterial endocarditis. There is also evidence that anabolic steroids, particularly in high doses, as abusers are known to take, increase irritability and aggression. Anabolic steroids have been reported to cause other behavioral effects, including euphoria, increased energy, sexual arousal, mood swings, forgetfulness, and confusion.

**Supplements**

In the United States, supplements such as dehydroepiandrosterone (DHEA) and androstenedione (Andro-street name) can be purchased legally without a prescription through many commercial sources including health food stores. They are often referred to as dietary supplements, although they are not food products. They are often taken because the user believes they have anabolic effects.

Steroidal supplements can be converted into testosterone or a similar body compound. Whether such conversion produces sufficient quantities of testosterone to promote muscle growth or whether the supplements themselves promote muscle growth is unknown. Little is known about the side effects of steroidal supplements, but if large quantities of these compounds substantially increase testosterone levels in the body, they may also produce the same side effects as anabolic steroids.

**Prevention**

A recent message from the Director of the National Institute on Drug Abuse (NIDA) indicates that “abuse of anabolic steroids differs from the abuse of other illicit substances because the initial use of anabolic steroids is not driven by the immediate euphoria that accompanies most drugs of abuse, such as cocaine, heroin, and marijuana, but by the desire of the abuser to change their appearance and performance, characteristics of great importance to adolescents. These effects of steroids can boost confidence and strength leading the abuser to overlook the potential serious long-term damage that these substances can cause.”

Through NIDA funding, the ATLAS (targeting male athletes) and the ATHENA (targeting female athletes) programs are two highly effective programs that not only prevent anabolic steroid abuse among male and female high school athletes, but also promote other healthy behaviors and attitudes. These programs have been adopted by schools in 29 states and Puerto Rico and are recognized as model prevention programs by Congress and the Substance Abuse and Mental Health Services Administration.

**Treatment**

Few studies of treatments for anabolic steroid abuse have been conducted. Current knowledge is based on information from physicians working with patients going through withdrawal. Some medications that have been used for withdrawal help restore hormonal balance. Medications for specific symptoms such as depression and aches have also been used. In some cases behavioral therapies are applied if the patient requires assistance beyond withdrawal.

**References:**

- U.S. Department of Health and Human Services, National Institute on Drug Abuse, NIDA InfoFacts: Steroids (Anabolic-Androgenic), March 2005
- U.S. Department of Health and Human Services, National Institute on Drug Abuse, Research Report: Anabolic Steroid Abuse, April 2000