The Abuse Of Anabolic Steroids

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ANABOLIC STEROIDS, ONE OF THE classes of banned doping agents listed by the International Olympic Committee (IOC), are derivatives of, and include the male hormone, testosterone.

This hormone is a normal body chemical, present in every normal person but a different levels. It is produced naturally by the body to promote, regulate and maintain physical and sexual development in males. It is released from the testes and arenal glands in males and the adrenal glands in females, and is of course in low concentrations in the blood of women.

Biologically, testosterone is regulated by what is called "the negative feedback" principle. This is a well established and long known biological control system where the"end product" chemical feeds back into its own regulating system to switch off its own production at generically determined levels for each individual.

This system is fundamental to the balance of the body's chemistry. It may be distrupted by diseases or the artificial administration - by mouth or injection - of "end-product" chemicals. The agent which regulates the production of testosterone by the testicle comes from the pituitary gland at the base of the brain and is called the Luteinising Hormone (LH).

LH is largely responsible for blood levels of testosterone and a normal ratio between the two hormones is achieved in the balanced individual. If testosterone is injected in doses equal to or greater than the normal body production, it will have an effect of suppressing LH production from the pituitary gland. This will in turn shut off the body's own production of testosterone by the testicles, which will eventually shrink and atrophy. This can happen if there is misuse of anabolic steroids.

Anabolic steroids are chemical analogues of the testosterone molecule. These chemicals are redesigned versions of naturally occuring molecules. Such methods of chemical manipulationare often used in developing new drugs for medical use and are standard techniques in the pharmaceutical industry.

It was for the production of clinically useful drugs that these molecular manipulations of testosterone were undertaken. The first synthetic anabolic steroids were created in the 1940s in response to the needs of severely malnourished prisoners of war and concentration camp internees.

Examples of anabolic steroids include ethyloestrenol; fluocysmesterone; methandienone; methenolone; methyltestosterone; nandrolone; oxandrolone; oxymetholone and stanolone. In any case, there have been no new steroids synthesised recently. Research on new steroids has almost come to a standstill.

The use of anabolic steroids is medically controlled in many instances. Possession of any steroids intended for non-medical use is illegal. Clinically, the use of these agents have been limited to promoting weight gain following conditions such as severe trauma and extensive surgery and to offset protein catabolism associated with prolonged corticosteroid therapy.

They have also been used in the treatment of refractory anaemia due to bone marrow hypoplasia, aplastic anaemia, osteoporosis and inoperable mamary carcinoma (breast cancer).

However in cases of cardiac, hepatic or renal insufficiency, or the use of oral hypoglycaemic agents and insulin, use of such drugs need special precautions. Anabolic steroids are contraindicated in cases of carcinoma of the prostate, testes or male breast, severe liver damage, pregnancy and lactation.

Of late, steroids are of particular interest to HIV-infected people. This is because the problems that steroids were first designed to address are similar to the problems which become more pronounced as HIV progress. These include decreased lean body mass, decreased energy utilisation, decreased oxygen efficiency, decreased glycogen stores, increased catabolism, increased production of cortisol (another catabolic hormone) and negative nitrogen balance.

People with the HIV virus value most of the anabolic effects of steroids, since they have undergone metabolic changes which can potentially lead to wasting of the muscles. These steroids may reverse those metabolic changes.

Nevertheless, misuse of anabolic steroids in the sports world has brought the substances some illrepute. In fact, its popularity in some sports sub-cultures has led to its abuse in a variety of sporting events. This makes steroids an attractive commodity in the black market.

Testosterone, for example, is a prime candidate for abuse because it confers some of the properties that all athletes seek. However, because of its marked effects on male sexual development, other synthetic steroids are preferred.

Basically, testosterone has two types of actions.

First, it promotes the development of secondary sexual characteristics in men. It also enhances development of accessory male reproductive glands. It exerts androgenic activity in varying degrees and may produce masculinisation and menstrual disturbances in women an precocious puberty in children. The secondary sexual characteristics enhanced by it are distribution of body hair, voice characteristics and levels of aggresion.

The second action is a general one which promotes the build-up of muscles. Thus, the difference in muscularity in normal males and females are due to the different levels of testosterone circulating in the body.

Anabolic steroids were developed artificially from testosterone in an attempt to enhance the muscle building properties of the hormone relative to its other effects. The drug acts to ptomote protein synthesis, utilisation and deposition. It produces a positive balance, induces erthropoieses (blood formation) and decreases bone resorption and promotes calcium deposition. It has been suggested that some beneficial effects of anabolic steroids, in fact, come from their residual testosterone effects.

An example is dianabol, which chemically looks like testosterone. The minor changes in tis molecular structure subtly alter its functions in relation to its biological system. However, no chemical has been produced which has all of the muscle building effects without the sexual effects. In any case, it is thought that both groups of effects are of potential benefit to sports performance anyway.

Usually, regular large doses of anabolic steroids are either ingested or injected by athletes. The dose may be three to five times that of medically useful doses. This will stopped two to three months before the doping-controlled event is anticipated. Some use it just for a month before the event.

This is then followed by weekly injections of testosterone. Closer to the event, diuretics, another class of drug banned in sports, is used to produce a large quantities of urine so that the remaining traces of dope are "washed out" making detection more difficult.

Nevertheless, dianabol and all anabolic steroids are still artificial molecules which are not found in normal people. Therefore, it can be positively identified as dope when tested in the laboratory. Any amount tested is illegal.

Testosterone is a natural hormone and is present in all humans. Its detection may pose a problem in the laboratory. There are certain techniques adopted, although debatable, in solving this problem.

Some athletes may also be given various salt supplements to restore the imbalance in the blood caused by the use of the steroids. The athlete may also take plenty of vitamins in the hopes of further obscuring the test results. During the event, he may rub chemicals such as detergent on his fingers so that by dipping them into the urine sample, there will be confusion in interpreting the laboratory results.

Like all drugs, anabolic steroids have toxic effects. They range from acne, virilisation, menstrual disturbances, suppression of gonadotrophic functions of the pituitary, precocious puberty, growth retardation, infertility, salt and water retention, oedema, hyperlipidaemia, polycythaemia, cholestatic jaundice and masculinisation of the foetus in pregnant women.

Despite this, many althletes still believe that anabolic steroids can improve their mucles strength, appetite, attitude, aggression and recovery from heavy training and competition. Some are not only convinced that anabolic steroids can assist performance, they are also suspicious that their rivals may also be using them.