A nursing perspective on the misuse of anabolic steroids

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There is widespread use of anabolic steroids in the athletic community (Windsor and Dumitru, 1988). The potential health complications associated with this represents a serious risk to an otherwise healthy population. It is important for nurses to be knowledgeable about anabolic steroid abuse and to be able to identify users and populations most exposed to these drugs.

Anabolic steroids have been in the news recently after British tennis player Greg Rusedski was cleared by the Association of Tennis Professionals of knowingly taking a banned substance following a positive test for the steroid nandrolone. Anabolic-androgenic steroids are synthetic derivatives related to the male sex hormone, testosterone (androgens). They function in a similar way to testosterone by binding to special receptor sites on muscle and other tissues, promoting protein synthesis in skeletal muscle (anabolic effect) and the development of male sexual characteristics (androgenic effects) (Yesalis and Bahrke, 2002) (Box 1).

Anabolic steroids are used to treat conditions caused by abnormally low levels of testosterone, such as delayed puberty. They are also used to treat body wasting in patients with diseases such as Aids.

Despite a ban by the International Olympic Committee (IOC) and irrespective of educational and preventive measures, the use of anabolic steroids has become increasingly prevalent in the athletic community. It is estimated that 1–3 million athletes in the US alone have used anabolic steroids (Silver, 2001). The enhancement of athletic performance and the incidence of major side-effects through using anabolic steroids are areas of great controversy (Windsor and Dumitru, 1988).

Ergogenic aids

Ergogenic aids are used by amateur and professional athletes to enhance athletic performance (Yesalis and Bahrke, 2002). An ergogenic aid is defined as a means of enhancing energy utilisation, including its production, control and efficiency.

Common ergogenic aids include anabolic steroids, which have been shown to increase strength and have significant effects on body composition (abdomen skinfold significantly decreases). Body weight, arm girth, and rectus femoris circumference in male athletes are also affected. Research indicates that increases in muscle mass and strength during anabolic steroid administration are only observed in athletes who are already weight-trained and who continue intensive training while consuming high-protein, high-calorie diets (Bruno, 1990).

Anabolic steroids can be administered orally as tablets or capsules, by injection into muscles, or as ointment preparations rubbed into the skin.

Types of anabolic steroid

- **Androstenedione** – A common anabolic-androgenic steroid used to raise blood testosterone levels to increase strength, lean body mass and sexual performance. There is limited research substantiating that androstenedione actually significantly increases strength and/or lean body mass (Yesalis and Bahrke, 2002). Long-term health effects of prolonged supplementation are unknown.

- **Dehydroepiandrosterone (DHEA)** – A weak androgen also used to elevate testosterone levels. DHEA is advertised as an anti-obesity and anti-ageing supplement capable of improving libido and boosting vitality and the immune system. But research demonstrates that DHEA supplementation does not increase serum testosterone concentrations or improve strength in men. It may have virilising effects on women (Yesalis and Bahrke, 2002).

- **Tetrahydrogestrinone (THG)** – This has only just been discovered, so little is known about it. Described as a ‘designer’ steroid, THG was originally undetectable by standard drug-testing methods. The World Anti-Doping Agency (WADA) has recently unveiled a method of detecting THG that has been communicated to all WADA-accredited laboratories worldwide.

Current UK screening procedure for athletes:
- Evidence from metabolic profiles (isotopic ratio measurements) is used to draw definitive conclusions;
- A testosterone to epitestosterone ratio > 6:1 in urine indicates a positive test;
- A relevant medical authority conducts an investigation before the sample is declared positive. A full report is written and previous tests are sampled;
- If no previous tests are available the athlete is tested without prior warning once a month for three months;
- Failure to comply with the procedure is regarded as a positive test result.

Side-effects of anabolic steroids

**Effects in men**

Excessive levels of testosterone can be converted into the female sex hormone oestrogen, causing the formation of some female characteristics such as breasts (gynaecomastia). This usually happens (prevalence 52 per cent) after a steroid cycle has been completed and there
is an imbalance in sexual hormones in mammary tissue. A high remission rate of gynecomastia can be achieved with the suppression of anabolic steroid intake and treatment with tamoxifen. If gynecomastia persists, surgery is an option.

Data supports the theory that anabolic steroids, as androgenic compounds, enhance sexual desire (Moss et al, 1993) but this effect is only temporary.

When the body becomes accustomed to the steroid, males will experience a significantly higher incidence of erectile dysfunction and will eventually feel less sexual desire. Steroid abuse is also linked with the shrinking of testicles, reduced sperm count, infertility, and increased risk of prostate cancer.

Masculinisation in women
In females anabolic steroid use will result in the acquisition of masculine characteristics. Anabolic steroids are used in a cyclical manner, often with several drugs taken simultaneously. Irreversible side-effects include a deepening of the voice, increased facial and body hair, aggression, clitoral enlargement, and menstrual irregularities.

Adolescents
Recent evidence suggests that steroid abuse among adolescents has become more prevalent, while awareness of health risks associated with such use has declined (Monitoring The Future, 2000). Anabolic steroids can cause premature skeletal maturation and accelerated puberty changes resulting in a premature halt in growth.

Behavioural changes
Research into psychiatric effects in athletes who use anabolic steroids over a long-term cycle suggests that both men and women can develop extremely aggressive behaviour. Some athletes believe this behavioural change to be an advantage as it can promote harder and more intensive training. However, such a change can also result in destructiveness, an inability to control one’s behaviour, and loss of friendships. Abusers may also experience depression when performance levels drop without the use of steroids. This depression can be exacerbated by the increased oestrogen levels.

Health implications
The short-term health effects of anabolic steroids have been increasingly studied and reviewed. Anabolic steroid use has been associated with several adverse and even fatal effects.

However, the incidence of serious effects reported so far has been extremely low. Even though anabolic steroids improve lean body mass, studies have shown that they induce a 25–27 per cent decrease in high-density lipoprotein cholesterol (HDL-C).

HDL-C is involved in the transportation of endogenous cholesterol from tissue to the liver and is therefore important in decreasing the risk of cardiovascular disease. Reduction in HDL-C as a side-effect of taking anabolic steroids is virtually reversed six weeks after cessation of drug use (Kuipers et al, 1991).

Anabolic steroids can also have serious adverse effects on hepatic and endocrine function, particularly when the drug is consumed in large quantities or over a long time. Oral steroidal compounds can cause liver damage (pseudos hepatitis) that can be fatal, as such damage is not usually discovered until the liver has completely shut down. Diastolic blood pressure also increases with the use of anabolic steroids but can return to pre-anabolic values about six weeks after cessation of drug use (Kuipers et al, 1991).

The long-term effects of anabolic steroid use are generally unknown. Evidence is primarily based on case reports rather than epidemiological studies.

However, with such detrimental side-effects as increased blood pressure and decreased HDL-C levels, anabolic steroids may significantly increase the risk of cardiovascular disease.

In addition, people who inject anabolic steroids run the risk of contracting or transmitting diseases such as HIV/Aids, hepatitis B and C, and bacterial endocarditis.

Nursing implications
Current research does not link life-threatening side-effects with intermittent use of anabolic steroids but many concerns remain. Dangerous situations include the use of anabolic steroids by adolescents, pre-adolescents, individuals who have liver disease or heart disease, and the use of oral compounds in high doses for long periods of time.

It is important for nurses to be knowledgeable about anabolic steroid abuse and to be able to identify the users and populations that are most exposed to these drugs. This knowledge will allow nurses to inform users of the detrimental side-effects and potential long-term health risks associated with steroid abuse.

**REFERENCES**


This article has been double-blind peer-reviewed.

For related articles on this subject and links to relevant websites see www.nursingtimes.net

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**BOX 1. TYPES OF STEROIDS**

| **Corticosteroids** | Natural or synthetic steroids associated with the adrenal cortex. They control or influence body processes such as carbohydrate and protein metabolism, electrolyte balance, cardiovascular system, skeletal muscle, kidneys, and other organs. |
| **Oestrogens and progestogens** | Female sex hormones. These are responsible for the development of secondary female characteristics and maintenance of the female reproductive system. |
| **Androgens** | The androgen testosterone develops male secondary sexual characteristics and maintains the male reproductive system. |