

Steroid Hormone in Ageing

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Chemically steroids are similar to that of cholesterol and in most instances these hormones are synthesized from cholesterol. These are lipid soluble and consist of three cyclohexyl rings and one cyclopentyl ring combined into a single structure. Steroids are secreted by the adrenal cortex, ovaries, testis, and placenta. Aldosterone, cortisol, estrogen, and testosterone are some common steroids in the body [1]. Too much or too little secretion of steroids leads to de-arrangements in the body [2]. Estrogen promotes growth and development of female reproductive system, female breast and female secondary sexual characteristics, while testosterone promotes development of male reproductive system and male secondary sexual characteristics. Over production of adrenal androgens leads to adreno-genital syndrome among females; masculinizing effects, develops male pattern of body hair, "Hirsutism" (muscular limbs with deep voice, and small breast in females). However, excess secretion of adrenal androgens in males has no apparent effects but abundance of masculinizing effects.

Lets discuss about synthetic steroids [3], corticosteroids such as cortisone and prednisone, are drugs that are used in controlling inflammation, to treat arthritis, asthma, lupus, multiple sclerosis, eczema and some cancer conditions. Anabolic steroids such as androstenedione or andro are like body's natural sex hormone testosterone. Medical uses of anabolic steroids include some problems in men for instance late puberty and muscle loss in some diseases. When used, anabolic steroids increase the levels of testosterone in the body and these stimulate muscle tissue in the body to grow.

Sometimes people may believe that taking anabolic steroids is a way of getting healthy and fit and it stops ageing process but a study reported that there is little or no benefit of hormone replacement in persons who do not have a hormone deficiency [4]. However, it may become a dangerous drug habit. These drugs are sometimes taken illegally to increase muscle mass and athletic performance [5]. Anabolic steroids are usually injected into the muscle, but can sometimes be taken as tablets or as a cream or gel applied to the skin. Most users are aware of the dangers of taking the drugs, and have ways of getting the desired effect without the undesirable side effects. This involves injecting the drugs for a period of time, then stopping for a rest period before starting again. This is known as 'cycling'. More than one type of anabolic steroid may be used at a time. Users believe that this increases the effectiveness. Users tend to exercise more when they are taking high doses, to make the most of their better performance during this time. Athletes have been known to try to time their injections so the drug is out of their system by the time they are drug tested.

Regularly taking anabolic steroids may cause a range of side effects both in males and females [6]. Females may experience growth of facial and body hair, loss of breasts, a deepened voice, hair loss, and severe acne. On the other hand male may develop problems like infertility, shrinking of testicles, baldness, breast development, and increased risk of developing prostate cancer. In addition, both men and women who take anabolic steroids are at risk of developing any of the following medical conditions; heart attack or stroke, liver or kidney tumors, high blood pressure, blood clots, fluid retention, high cholesterol, aggressive behaviors. Like many other substances, anabolic steroids are addictive and people can crave the drug, require more to get the same effect and have withdrawal effects. If it is suddenly stopped, there may be strong desire to take them again. Someone addicted to anabolic steroids may continue to use the drugs despite experiencing unpleasant physical

side effects. Usually doctors prescribe any type of steroid medication by tapering its dosages, if it is not followed, it can result in withdrawal symptoms that include depression and apathy, feelings of anxiety, insomnia, and anorexia.

A study reported that estrogens interact with neuronal networks at many different levels, and may affect some of the risk factors for Alzheimer's Diseases (AD) [7]. It also found that sex steroids are crucial to the development and ageing of brain regions affected in age-related brain diseases (for example AD) and can affect cognitive function in elderly women. As reported by the study, routine therapeutic use of estrogens in women with AD is not justified but it may have a role in the prophylaxis of the disease.

In his paper, Morley (2013) reported that testosterone in hypogonadal males has a number of positive effects such as improving libido and erectile capacity, increasing strength and bone mineral density, and perhaps having a small effect on cognition [4]. However, the study found little evidence to recommend DHEA, growth hormone, ghrelin, or melatonin to older persons. This study also emphasized that these effects need to be balanced against long-term side effects. One danger in using supplements is, the ingredients in the supplements can cause harmful interaction with other medication and invite serious medical conditions. Few years back anabolic supplements containing androstenedione were available at food stores, now these cannot be sold without prescription because of the safety reasons.

Recently topical steroid hormones are used in menopausal skin treatments [8]. It is a relatively new field in skin care and it requires more research to assess benefits and side effects. The research on male skin and hormone therapy is even rarer. Hormone Replacement Therapy (HRT) does not always proved to be fully beneficial in menopausal women, particularly in developing country settings where pre assessments and follow ups are inadequate. Thus, further work is needed to make evidence based decisions.

Globally the ageing population is increasing and women are at the vast majority of this growth. Therefore, it is not surprising that most of the anti-ageing products and treatments are targeted at women. Steroid hormones are truly essential and powerful substances for human biology. The benefits of using steroid hormones in ageing population should be weighed against possible harms. At individual level, pre-assessments and regular follow ups by licensed medical professionals should be mandatory for the persons who use these preparations and these patients should carry 'steroid user' card. Although some people believe that if hormone steroids are used carefully in moderation these are less likely to have adverse effects even after long term use, which

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does not mean it would not happen. Therefore, steroid hormones should be used judiciously and with extra caution in both males and females, particularly when to be prescribed in ageing populations.

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