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Anabolic Steroids -- Part II

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The earliest study I found of steroids and muscular hypertrophy was in 1938.[1] As I continued my literature review on steroids, I found that historians tend to disagree on exactly when anabolic steroids were used for athletics; however, most of the evidence points to the Russians using testosterone and its derivatives in the early 1950s, with the Americans starting either in the mid or late 1950s, depending on the source. Throughout the 1960s, steroids were generally used by strength athletes, such as power lifters, Olympic lifters, and body builders. Steroid use spread to field athletes in the mid and late 1960s. By the early 1970s, most world class track and field athletes that needed strength or explosiveness were using steroids. Strength athletes in other sports such as football also discovered steroids in the early 1970s. By the end of the decade, football players at all levels were using anabolic steroids and, as more and more coaches realized the importance of strength and explosiveness in their various sports, athletes in what would be considered non-traditional steroid sports begin to use steroids. Interestingly enough, the steroid use coincided with the decline of the myth that "muscle-bound" athletes were not able to perform well.

Graham and Kennedy estimate anabolic steroid use in the United States of at least one million.[2]

Side Effects of Steroids[2]

The following is a list of the major negative effects associated with the use of anabolic steroids:

1. Hepatic
*Peliosis hepatitis**
*Hepatoma**
Cholestatic jaundice
Elevated liver function tests

2. Cardiovascular

Hypertension

Decreased HDL cholesterol

Increased LDL cholesterol

Increased triglycerides

Atherosclerotic heart disease

Cardiomyopathy

Cerebrovascular accident

3. Skeletal

Premature epiphyseal closure*

4. Immune

Reduced immunoglobulin levels

Altered natural killer function

5. Endocrine

Male -- testicular atrophy, decreased sperm count, gynecomastia, decreased testosterone, decreased LH, decreased FSH, altered glucose tolerance, hyperinsulinism.

Women -- Hoarsening of the voice, enlarged clitoris*, menstrual irregularities, decreased breast size, male pattern baldness,* fetal abnormalities.

6. Dermatology [4]

Cystic acne

Comedones

Sebaceous cysts

Alopecia

*Hirsutism**

Striae distensae

Seborrhea

Rosacea

7. Physiological

Euphoria

Aggressiveness

Marked libido changes

Mood swings

8. Subjective

Mood changes

Aggressiveness

Changes in libido

Muscle spasm

Muscle aches

Headaches

Nervousness

Tension

Dizziness

Nausea

Euphoria

Rashes

Urethritis

Scrotal pain

Increased urine output

*Considered an irreversible side effect[5]

The above list is both exhaustive and frightening. According to Dr. Phillips, the most common side effects of steroid use are the following:[6]

Sodium retention, high blood pressure, headaches

Acne

Gynecomastia

Aggression

Blood lipid changes (increased LDL, decreased HDL, and increase in total cholesterol) Palpitations

We will now discuss some of the side effects that receive the greatest amount of media attention.

Hepatic side Effects

Peliosis hepatitis is a disease of cattle caused by contaminated grass. There is not a single case of this occurring in an athlete taking anabolic steroids. There are cases of people contracting this disease who took anabolic steroids for hematological disorders.[2] Again, according to Drs. Graham and Kennedy,[2] steroid-induced hepatomas occur within those who have primary hematological disorders. They further state there have only been three cases in the literature of hepatoma in the athletes, and there was no record of the athletes hematological status. Furthermore, Dr. Phillips states that two of the athletes used high doses of oral steroids for four consecutive years. Even proponents of steroid use state that steroids should be used no more than 12 weeks at a time, and that athletes should refrain from using steroids for at least as long as they used them before they start another cycle.[6] I found it interesting that jaundice and cholestasis are surprisingly uncommon and no specific clinical hepatic syndrome has ever been demonstrated in athletes abusing anabolic steroids.[2]

It is not uncommon for an athlete who is training heavily to have increases in SGOT and SGPT. To correctly monitor an athlete's liver function, one should order the isoenzymes of lactin dehydrogenase and alkaline phosphatase, which are liver specific.[5]

Teenage Use

Clearly, epiphyseal closure is a very serious side effect of anabolic steroids and all doctors should urge teenagers, especially young teens, to discontinue steroid use. This can be accomplished much easier than in adult athletes. Making coaches and parents aware of the problem increases your chances of attaining a complete and total cessation of teen steroid use.

Acne is another common side effect of anabolic steroids. Most teens have more than enough pilosebaceous gland activity. Administration of anabolic steroids increases already overactive structures. The bottom line is to emphasize to your teenagers that when they take steroids, they should expect to see a pronounced increase in acne.

Cardiovascular Side Effects

It is very clear that steroids have marked cardiovascular effects. Although cholesterol alterations are reversible with cessation, it is nevertheless clear from my literature review that this is a major risk factor of anabolic steroid ingestion and must be aggressively supported nutritionally in those athletes who continue to ingest anabolic steroids. When anabolic steroid use stops, the athletes must maintain a moderate aerobic exercise program coupled with a diet low in fat (20 percent of the calories) and maintain physician contact with follow-up laboratory analysis.

Females Steroid Use

Steroids in women is an area where I recommend you really emphasize to your patients the defeminizing effects that may occur with the use of male hormones. Make it clear that a high percentage of the irreversible side effects of steroid use occur in the female athlete.

Connective Tissue Side Effects

In my research, I was unable to come across what I feel is one of the most common negative effects of anabolic steroid use, and that is post cycle injury to connective tissue. I did find a few reviews on steroid-induced tendon and muscle rupture; however, these injuries are very rare. What is common are sprains, strains, bursitis, tendinitis, and capsulitis injuries in athletes who have recently discontinued steroid use. Anyone who has spent time in a serious lifting gym has heard, "I don’t get injured when I’m on the juice," or "Every time I stop I get injured." Steroid users rationalize that they should just continue with anabolic steroids, adding additional types or changing types so they will not get injured. Therefore, in addition to nutritional support, when doctors do succeed in having athletes discontinue steroid use, they must emphasize that the athlete is at a higher risk for injury6 and implement a "safe" workout for six weeks following steroid cessation. Generally, two to four weeks after ingestion of steroids is discontinued, connective tissue injuries tend to occur. Steroids cause muscles to hypertrophy faster than supporting ligamentous and tendinous structures. When the steroid use stops, testosterone levels plummet because the body’s negative feedback system shuts its own production down when steroid ingestion begins. Therefore, there is a rebound period with low testosterone levels. This equates to a decreased nitrogen balance, decreased protein synthesis, and decreased intramuscular fluid retention. Add to this heavy muscular loads to tissues that are no longer supercharged with pharmacological androgens, and the result is injury.

Safe Workout

1. Lighten the amount of weight lifted.

2. Increase the amount of repetitions.

3. Emphasize the importance of strict form on every exercise, whether free weight or machine.

4. Decrease total sets.

5. Increase rest periods (that is, four instead of six lifting sessions per week).

By decreasing the amount of weight used and increasing repetitions, less load is placed on connective tissue that is susceptible to injury. At the same time, this workout provides greater circulation to these vulnerable areas, which will not only guard against injury, but will maintain the majority of the additional muscular tissue the athlete gains while on synthetic testosterone derivatives. Remember, although you have recommended lighter weights, higher repetitions, better form, and more rest, this does not mean that your athlete has to decrease intensity.

Nutritional Support for Steroid Cessation:

1. Decrease the amount of dietary protein to l gm for each l.5 to 1.75 pounds of body weight (athletes who use anabolic steroids must ingest excessively high amounts of protein in order for the steroids to have the desired effect; however, when steroid ingestion stops, the high amount of protein then works as a disadvantage to the athlete by disrupting intramuscular osmotic balances, which will result in overtraining and increased injury.)

2. Add 32 ounces of additional fluid per day.

3. Increase vitamin C to a minimum of two grams per day.

4. Increase zinc to a minimum of 50 mg per day.

5. Manganese sulfate, chondroitin sulfate, perna canaliculus or mucopolysaccharides should be ingested at a level of 100-150 mg per day.

6. A strong multivitamin, multimineral formula.

I recommend the athlete ingest these levels of micronutrients for six weeks. After that they should continue with a good strong multivitamin, multimineral formula.

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