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EXS 250

Literature Review

Dr. Dearie

The Effects of Performances Enhancers in Sport

We have known for years that anabolic steroids take a massive toll on our health short and long-term, but what about the PES that we don't talk about?

PES; Performance Enhancing Substances are unfortunately still commonly used in the world of sports and physical activity. Sure, we know about steroids, we've been over that. But what about AAS, hGH, EPO, amphetamines, other stimulants especially one that may shock us all, creatine. The first focus will be on AAS. So, what is AAS? AAS stands for Anabolic-Androgenic Steroids, which "have traditionally received the greatest attention among PES in sport," (Springer, 3.1, 2015). It is reported that in the United States this substance is used by 6.4% of males and 1.6% of females, and most used by a recreational or competitive athlete where the use of AAS "increased by 91% with the participation in at least one sport" (Springer, 3.1, 2015.) AAS does not discriminate, as 6.3% of high school varsity football players have reported former or current use of the steroid. The reason why people use AAS is because of its effects on muscle growth due to its mask that looks like testosterone. The main reason why it is so dangerous especially for males is because they already produce enough testosterone. Clinical trials show that when men took AAS and paired it with exercise, they saw an "increased fat-free mass and muscle size in strength" (Springer, 3.1.2, 2015). Men were able to put on mass quicker and easier without having to worry about increased fat in their abdominal region, and even thinned out.

A very similar substance without the fat-free effects, is most used in the United States today, creatine. Creatine brings in about \$400 of annual sales, with “approximately 21,000 NCAA student-athletes” using creatine 12 months or less from within the survey (Springer, 3.2, 2015). Creatine monohydrate is the most used form due to it being a naturally occurring compound (Springer, 3.2, 2015). So, what is creatine exactly? “Creatine is an amino acid formed from arginine and glycine through a transverse enzyme that produces ornithine and guanidinoacetate” (Springer, 3.2.1, 2015). For the most part, this is a process that happens in our kidneys apart from methylation. Our body produces our own creatine, which 95% of it is stored in our skeletal muscles. Like AAS, creatine also influences our performance in sport and in the gym.

Studies on creatine supplements have found creatine enhances our “Strength, power output, sprint performance, total work to fatigue, peak force, and peak power performed during multiple sets of maximal-effort contractions” (Springer, 3.2.2, 2015). On the contrary, some researchers choose to call creatine, as well as pre-workout, a placebo. Meaning, our performance is enhanced because the product makes the customer believe that the supplement is responsible. Creatine is not banned in the NCAA due to it being listed as an over the counter, but it is prohibited that programs distribute the supplement to their athletes. However, this does not mean that creatine is a dangerous substance.

Both studies had a specific method of testing. For AAS, chromatographic and mass spectrometric techniques have gained popularity. These techniques help differentiate between natural and synthetic endogenous steroids. The method of research called for an indirect approach, which allowed the researchers (Momaya, Fawal, Estes) to examine the effects of AAS to help profile it as an endogenous steroid which can lead to research of designer steroid use in

an athlete, which AAS, is also known as a designer steroid. Testing resulted in multiple findings of adverse effects, such as “acne, testicular atrophy, gynecomastia, cutaneous striae, and injection site pain” (Springer, 3.1.3, 2015). The study also included life-threatening effects of use such as “cardiovascular disease with impaired diastolic filling, arrhythmias, stroke, blood clots, liver dysfunction, and cancer” (Springer, 3.1.3, 2015). Lastly, this study did not test creatine, which leaves a huge question mark to other possibilities of its effects on the body. As a user of creatine, further study is needed. Despite the inexistence of testing, adverse effects are added onto the study of what researchers do in fact know. With short-term use, creatine is “regarded as safe and without significant adverse effects” (Springer, 3.2.3, 2015). Long-term studies are limited, so there is not much we know. What the researchers do know and provide, is that creatine poses as a “risk of dehydration” and its “osmotic effect can lead to water being drawn into the muscles” (Springer, 3.2.3, 2015). Researchers advise that during the use of creatin, that the user remains hydrated, as it may be a possibility that creatine is linked to “subclinical dehydration and heatstroke.” (Springer, 3.2.3, 2015).

Unfortunately, this is all we know about creatine, but there is some light on the effects of AAS and other PES used by athletes and advent gym users. It should be recognized that this study records useful methods, testing, physiology, an overview of how performance is enhanced, as well as how users are negatively impacted. The study also includes useful figures, displaying how the substances travel and effect the body and our cells.

Works Cited

Momaya, A. (2015, February 8). *Performance-Enhancing Substances in Sports: A Review of the Literature*. Review Article. Retrieved February 24, 2022, from https://suny-cor.primo.exlibrisgroup.com/permalink/01SUNY_COR/nmv6dk/cdi_proquest_miscellaneous_1669831536