



ISSN: 2456-0057

IJPNPE 2018; 3(1): 1242-1245

© 2018 IJPNPE

www.journalofsports.com

Received: 28-11-2017

Accepted: 29-12-2017

Navjot Kaur

M.Phil. Scholar, Department of
Physical Education, Punjabi
University, Patiala, Punjab,
India

Pharmacological agents in sports: Safe or deadly

Navjot Kaur

Abstract

Many forces are at work to promote supplement use and abuse. Most nutritional ergogenic aids are unjustifiable. Only positive choices are fluid, CHO and HMB. Is steroid, or any ergogenic, abuse a symptom of a larger problem (e.g: win at all costs)? At last we realize that all the pharmacological agents have worst side effects on the systems of athletes.

Keywords: Pharmacological agents, sports, supplement etc.

Introduction

Ergogenic is defined as, “tending to increase work” An ergogenic aid is defined as “A physical, mechanical, nutritional, psychological, or pharmacological substance or treatment that either directly improves physiological variables associated with exercise performance (Robert A. Robergs, Ph.D., FASEP, EPC Professor of Human Movement and Health). Mostly players use performance enhancers to improve their performance during high-intensity physical exercise. A performance enhancer, or ergogenic aid, is anything that gives you a mental or physical edge while exercising or competing. There are a variety of both safe and harmful ergogenic aids (Medically Reviewed by Michael Charles, MD on August 9, 2016 - Written by Brian Krans and Rachel Nall). Ergogenic aids are any external influences that enhance athletic performance or facilitate physical exercise. Nutritional ergogenic aids are dietary supplements that supposedly enhance performance above levels anticipated under normal conditions. The term ergogenic means “work producing.” Athletes hope that ergogenic aids will give them a competitive edge and they fear losing. Since sporting competitions are sometimes won by a difference of 1/100th of a second, it is not surprising that athletes want to try the newest ergogenic aid. By definition, a supplement is something added to the diet to make up for a nutritional deficiency. Athletes, however, consume dietary supplements to improve athletic performance and health. The quest for performance-enhancing supplements is not new. Athletes of ancient days would eat the heart or liver of an animal, such as a lion or deer, to increase their swiftness, courage or strength. While it is no surprise that competitive athletes use supplements, supplement use is not limited to the elite level. A recent survey by the National Strength and Conditioning Association (NSCA) at their annual convention reported that 71% of the coaches encouraged supplement use among their athletes. When asked which athletes were helped by supplementation, 92% of coaches believed that the performance of professional athletes was increased, 91% believed that the performance of collegiate athletes was increased and 65% believed that the performance of high school athletes was increased.

Dietary supplements are a multi-billion dollar industry that targets a wide range of populations, including athletes. Between the years of 1990 and 1996 supplement sales almost doubled from \$3.3 billion to \$6.5 billion. The Dietary Supplement and Health Education Act of 1994 (DSHEA) bolstered sales by classifying “dietary supplements” in their own category and not as “food additives” or “drugs.” Under the DSHEA, “dietary supplements” are defined as vitamins, minerals, amino acids, herbs and other botanicals.

Examples of ergogenic AIDs

- Swim suits
- Equipment

Correspondence

Navjot Kaur

M.Phil. Scholar, Department of
Physical Education, Punjabi
University, Patiala, Punjab,
India

- Steroids
- EPO
- Diuretics
- Blood doping
- Caffeine etc. (Robert A. Robergs, Ph.D., FASEP, EPC Professor of Human Movement and Health)

Types of ergogenic AIDS

- Pharmacological Agent
- Mechanical Agent
- Psychological Agent
- Physiological Agent
- Nutritional Agent

Why athletes and exercisers take drugs?

☐ Physical reasons include

- Enhance performance
- treat injury
- look better
- control appetite and lose weight

☐ Psychological reasons include

- escape from unpleasant emotions or stress
- build confidence or enhance self-esteem
- Winning
- Increase motivation

☐ Social Reasons include

- They are prepared to win at all costs
- Pressure to win from coaches and peer
- Fear of not winning
- By winning they can earn big money

Pharmacological agents

- Amphetamine
- Anabolic steroids
- Alcohol
- Beta blockers
- Caffeine
- Cocaine
- Diuretics

Amphetamine

It is a pharmacological agent. It stimulates the central nervous system it delays the point of fatigue during sustained exercise. It is given to mentally disordered people. Wrestlers, boxers use this. Dr. describes this drug on short term basis for treatment of obesity and minimal brain dysfunction in children.

Used by - Wrestlers, Boxers, Sprinter, Jumper, Swimmer.

Sports benefits

- Increase work capacities
- Self confidence
- Increase the concentration
- Decrease mental fatigue
- Help the athletes run faster, jump higher and throw further.

Harmful effect

- Aggressiveness
- Cardiac rest
- Dehydration

- Increase blood pressure
- It causes problems like irritability constipation and nutritional problems.
- It causes dizziness and feeling of depression.
- It increases mental confusion.

Anabolic steroids

Anabolic steroids are also known as anabolic androgenic steroids (AAS's), these are derivatives of the hormone testosterone. These help athletes to build muscle and to recover faster from training. It promotes the secondary male characteristics.

Used by- Body Builder, Baseball, Football, Basketball, Wrestling and football.

Sports benefits - Steroids are most commonly used by athletes involved in power sports, for example weight lifting, throwing and sprinting events. Field sports such as American Football and Rugby also demonstrate a high incidence of use, as does body building. The perceived benefits of AAS use include:

- Increased muscle bulk
- Increased muscle strength
- Faster muscle recovery
- Increase muscle size
- Increase the muscle mass (muscle hyper - Trophy)
- Reduced muscle catabolism (breakdown of muscle) following intense exercise which aids muscle recovery and development (not proven as yet)

Harmful effect

Side-effects from the use of steroids are extremely common and can be quite significant. Most side-effects are reversible once the athlete stops usage although serious long-term side-effects and even death have occurred as a direct result of steroid use.

- Decreased sperm production and sex drive
- Increased aggression, irritability and mood swings
- Liver disorders
- Acne
- It affects growth
- Female shows some male characteristics
- Decrease the functioning of kidney, heart and liver.
- Male type of voice
- Hypertension (high blood pressure)
- Raised cholesterol
- Gynecomastia (development of over-sized mammary glands in males)
- Menstrual irregularities (in women)
- Hirsutism (excessive hair growth occurring in females which follows the pattern of male hair growth, i.e. facial)
- Deepening of the voice
- Reduced immunity

Beta-blockers

Beta-blockers also known as beta adrenergic blocking agents. Beta blockers are dilators which cause dilation (widening) of vessels by relaxing the smooth muscles surrounding them.

Used By- Archer, Shooter, Chess.

Sports Benefits - Inhaled forms used for the treatment of Asthma and EIB has no performance-enhancing effect and so are permitted for use by WADA (world anti-doping agency). When administered by injection or tablet form they are thought to have anabolic effects (increased muscle mass, reduced body fat percentage and faster recovery rates) and so their use is prohibited.

- Alertness
- Increase concentration
- Reduce high blood pressure.

Harmful Effect

- Tachycardia (rapid beating of the heart)
- Palpitations (abnormal/irregular beating of the heart)
- Headaches
- Nervousness
- Sweating
- Nausea
- Vomiting
- Depression
- Hypertension
- Dizziness
- Upset stomach

Caffeine

Caffeine is a central nervous system stimulant. It is well known as one of the most active drug in coffee and tea. Large doses can make the individual over-excited and restless. The heart becomes more irritable, and may show extra beats. Caffeine is a naturally occurring substance, found in over 60 different plants. It is the most commonly used drug in the world as it is found in coffee, tea, chocolate and many carbonated and energy drinks. Caffeine promotes fatty acids release, fat burning does not appear to increase during exercise and carbohydrate stores are not protected. Caffeine is considered a banned substance by the National Collegiate Athletic Association if too high an amount is found in urine. It also helps with mental sharpness and decreases perceived exertion. (Supplements and Ergogenic Aids for Athletes Reviewed by Sharon Denny, MS, RDN Published December 03, 2014).

Used by- Cycling, Marathon runner.

Sports benefits

During periods of 30-120 minutes caffeine has been shown to produce the following benefits:

- Improved muscle contractibility
- Increased time to exhaustion
- Improved concentration
- Enhanced alertness
- Reduced fatigue

Harmful effect

- Abdominal pain
- Diarrhea
- Dehydration
- Restlessness, anxiety & irritability
- Headaches
- High blood pressure
- Interference with recovery and sleep patterns
- Palpitations
- Increased muscle tension

- Caffeine affects the blood vessels and the heart.
- It increases the contractile strength of the heart muscle.
- It may cause coronary heart disease.
- Long term coffee drinkers have intra-vascular blood clotting and ulcers.

Diuretics

Diuretics are the drugs used by the athletes for losing their body weight. If anything they have a detrimental effect on performance as they cause dehydration. Diuretics are used for two reasons. Firstly to lose weight rapidly in sports which require the athlete to be within a set weight limit and Secondly, to dilute the presence of illegal substances and aid their excretion.

Used by - Athletes in weight category sports like that judo, boxing, wrestling etc.

Sports benefits

It is generally used as an ergogenic aid for weight control.

They are also used to flush other drugs out of people's systems.

Harmful effect

- Dehydration
- Hypotension (low blood pressure)
- Muscle Cramps
- Electrolyte disturbances (alterations in the levels of electrolytes such as sodium, potassium and chloride)
- Muscle weakness
- Fatigue
- Body loses vital salts
- Loose motion
- Restlessness
- Dizziness

Conclusions

Many forces are at work to promote supplement use and abuse. Most nutritional ergogenic aids are unjustifiable. Only positive choices are fluid, CHO and HMB. Is steroid, or any ergogenic, abuse a symptom of a larger problem (e.g: win at all costs)? At last we realize that all the pharmacological agents have worst side effects on the systems of athletes. That's why (Robert A. Robergs, Ph.D., FASEP, EPC).

References

1. Jump up Thein LA, Thein JM, Landry GL. "Ergogenic aids. *Phys Ther.* 1995; 75(5):426-39. PMID 7732086. Retrieved 9 March 2015.
2. Jump up, Berardi John, Brooks Justin. BCAA and Athletic Performance. Retrieved January 2016. In this article, we'll discuss the effectiveness of one of these supposed ergogenic aids – branched chain amino acids (BCAA), 2006.
3. Jump up. Fallout from Performance-Enhancing-Drug Report Just Starting. miami.cbslocal.com/station/wqam/. Retrieved 2013-01-30.
4. Liddle DG, Connor DJ. Nutritional supplements and ergogenic Aids. *Prim. Care.* 2013; 40(2):487505. doi:10.1016/j.pop.2013.02.009. PMID 23668655. Amphetamines and caffeine are stimulants that increase alertness, improve focus, decrease reaction time, and delay fatigue, allowing for an increased intensity and duration of training.

5. Michael Charles, Brian Krans, Rachel Nall. A prospective study of drug for men and women. 2016; 262:2395-2401.
6. Robert Robergs A. Deadly effects of steroids and drugs on athletes. Med Sci Sports Exerc. 2013; 25(11):1275-8.
7. Sharon Denny. Physiological testing of the high performance athlete. Med Sci Sports Exerc. 2014; 12(9):275-280.
8. http://health.csusb.edu/dchen/sports%20nutrition/ergogenic_aids%20chapter.htm
9. <http://www.healthline.com/health/performance-enhancers-safe-deadly>