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Ergogenics Edge: Pushing the limits of sports performance

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Abstract
Performance enhancing drugs consist of a variety of substances, including medications, procedures and even devices that are intended to improve athletic sports performance. Some of these substances are naturally occurring, easily available and completely legal while others are manufactured, illegal, or banned by many sporting organizations. Many athletes, coaches, politicians and fans feel the use of certain substances is unethical in sports. Determining which substances are regulated, however, is an area of constant debate. Many performance enhancing substances classified as supplements are widely marketed as "health aids" yet have limited research on their safety or effectiveness. Being classified as a supplement means the contents of the product and the claims on the label have not been evaluated by the U.S. Food and Drug Administration and may not have any scientific basis. Numerous ergogenic aids that claim to enhance sports performance are used by amateur and professional athletes. Approximately 50 percent of the general population have reported taking some form of dietary supplements, while 76 to 100 percent of athletes in some sports are reported to use them. Physicians can evaluate these products by examining four factors (method of action, available research, adverse effects, and legality) that will help them counsel patients. In general, performance enhancing drugs and substances (ergogenic aids) can be categorized into the following areas. These are.

Keywords: Nutritional Ergogenic Aid, Physiological Ergogenic Aid, Psychological Ergogenic Aid, Mechanical Ergogenic Aid, Pharmacological Ergogenic Aid

1. Introduction

Ergogenic Aid

An ergogenic aids is defined as any substance that may enhance the physical performance through improved strength, speed, response time or the endurance of the athletes.

Ergogenic Aids may

- directly influence the physiological capacity of a particular body system thereby improving performance
- remove psychological constraints which impact performance
- increase the speed of recovery from training and competition

Nature of Ergogenic Aid

1. Direct act on muscle fibre
2. Counter-act fatigue product
3. Supply needed for muscular contraction
4. Affect the heart and circulatory system
5. Affect the respiratory centre
6. Delay the onset of fatigue
7. Counteract the inhibitory effort of the C.N.S on muscular concentration and other function.

Classes of Ergogenic Aids

There are several classes. They are as follows;

1. Nutritional Ergogenic Aid

Carbohydrates, protein, vitamins, minerals, water and electroliods.

2. Physiological Ergogenic Aid

Acupuncture, Blood Doping, EPO, Herbal Medicines, Homeopathy, Human growth hormone, Physiotherapy, Sports Massage, Sauna, Ultra-violet rays, Oxygen, recovery procedure etc.

3. Psychological Ergogenic Aid

Cantering, Cheering, Hypnosis, Imagery, Meditation, Music, Psychology, Relaxation, suggestion, rehearsal etc.

4. Mechanical Ergogenic Aid

Improved body mechanics, clothing equipment and skill training.

5. Pharmacological Ergogenic Aid

Stimulants, Narcotics, Anabolic Steroids, Beta Blockers and Diuretic.

In short anything that can be related to an improvement in performance is ergogenic aid. Some ergogenic aid like water, improved equipment, training condition, carbohydrate loading, warm-up technique are acceptable.

In 1985 I.O.C medical commission classified the prohibited ergogenic aids in to five types. These ergogenic has been declared prohibited. I.O.C defines the ergogenic aids sa follows:-

"The administration of or use by competing athlete of any substance foreign to the body or of any physiological substance taken in abnormal quantity or taken by an abnormal routine or entry in to the body with the sole intention of increasing in a artificial and unfair manner his/her performance in competition".

2. Stimulants

Stimulant, any substance that causes an increase in activity in various parts of the nervous system or directly increases muscle activity. Cerebral, or psychic, stimulants act on the central nervous system and provide a temporary sense of alertness and well-being as well as relief from fatigue. Drugs such as caffeine and the amphetamines belong in this category, and several groups of drugs chemically similar to antihistamines and phenothiazines also act as mild psychic stimulants. Cocaine, besides its effect as a local anesthetic, also stimulates the central nervous system, producing excitement and erratic behavior. The hallucinogenic drugs are also central nervous system stimulants. A second class of stimulants that affect the medulla and spinal cord includes derivatives of niacinamide (nicotinic acid amide) and other chemically diverse compounds; they are sometimes used to speed the return to wakefulness after anesthesia or to counteract barbiturate poisoning. Ammonia, in smelling salts, is also a medullary stimulant; the alkaloid strychnine is a spinal-cord stimulant.

3. Narcotics

Narcotics are natural upload drugs derived from the Asian poppy Palaver somniferous or semi-synthetic or synthetic substitutes for these drugs. Narcotics are drugs that dull the sense of pain and cause drowsiness or sleep. They are the most effective tool a physician has to relieve severe pain. Narcotics are also given pre-operatively to relieve anxiety and induce anesthesia. Other common uses are to suppress cough and to control very severe diarrhea. In large doses, they can suppress the ability to breathe and cause coma and death. Narcotics are also taken illegally for recreational use. Ethyl norphine, morphine etc are some example of narcotics.

4. Anabolic Steroids

Synthetic (man-made) hormones that simulate the effects of the male hormone testosterone. A group of drugs derived from the male sex hormone testosterone, most commonly prescribed to promote growth or to help the body repair tissues weakened by severe illness or aging. Some anabolic steroids are given as appetite stimulants. A group of compounds derived from testosterone or prepared synthetically to promote general growth. Anabolic steroids are used in the treatment of aplastic anemia, anemias associated with renal failure, myeloid metaplasia, and leukemia. Anabolic steroids are subject to abuse to promote muscle mass in athletes.

5. Beta Blocker

Beta blockers are medicines that affect the body's response to certain nerve impulses. This, in turn, decreases the force and rate of the heart's contractions, which lowers blood pressure and reduces the heart's demand for oxygen. The main use of beta blockers is to treat high blood pressure. Some also are used to relieve the type of chest pain called angina or to prevent heart attacks in people who already have had one heart attack. These drugs may also be prescribed for other conditions, such as migraine, tremors, and irregular heartbeat. In eye drop form, they are used to treat certain kinds of glaucoma. Beta blockers, also known as beta-adrenergic blockers, are available only with a physician's prescription. They come in capsule, tablet, liquid, and injectable forms. Some common beta blockers are atenolol (Tenormin), metoprolol (Lopressor), nadolol (Corgard), propranolol (Inderal), and timolol (Blocadren). Timolol and certain other beta blockers are also sold in eye drop form for treating glaucoma. Eye drops that contain beta blockers include betaxolol (Betoptic), cartelol (Ocupress), and timolol (Timoptic).

6. Diuretic

Diuretics are medicines that help reduce the amount of water in the body. Diuretics are used to treat the buildup of excess fluid in the body that occurs with some medical conditions such as congestive heart failure, liver disease, and kidney disease. Some diuretics are also prescribed to treat high blood pressure. These drugs act on the kidneys to increase urine output. This reduces the amount of fluid in the bloodstream, which in turn lowers blood pressure.

There are several types of diuretics, also called water pills:

- Loop diuretics, such as bumetanide (Bumex) and furosemide (Lasix), get their name from the loopshaped part of the kidneys where they have their effect.
- Thiazide diuretics include such commonly used diuretics as hydrochlorothiazide (Hydro DIURIL, Esidrix), chlorothiazide (Diuril), and chlorthalidone (Hygroton).
- Potassium-sparing diuretics prevent the loss of potassium, which is a problem with other types of diuretics. Examples of potassium-sparing diuretics are amiloride (Midamor) and triamterene (Dyrenium).

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