

PERFORMANCE ENHANCING DRUGS IN SPORTS: AN ANALYTICAL STUDY


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The use of legal and illicit medical substances is widespread in international sport and becoming more complex. Serious concern exists about the use of illicit substances, as listed in the list of the World Anti Doping Agency (WADA) of prohibited substances. This phenomenon is also present among athletes and positive doping cases have been reported in the media among local sportspersons from varying disciplines. Athletes have used a myriad of performance-enhancing substances since ancient times and this practice continues today. This review discusses the early history of doping in sport, the use of stimulants and anabolic during the nineteenth and twentieth century's, the current use of performance-enhancing drugs by Olympic, professional players. Doping is now a global problem that follows international sporting events worldwide. International sports federations, led by the International Olympic Committee, have for the past half century attempted to stop the spread of this problem, with little effect. It was expected that, with educational programs, testing, and supportive medical treatment, this substance-abusing behavior would decrease. Unfortunately, this has not been the case. In fact, new, more powerful and undetectable doping techniques and substances are now abused by professional athletes, while sophisticated networks of distribution have developed. Professional athletes are often the role models of adolescent and young adult populations, who often mimic their behaviors, including the abuse of drugs. This review of doping within international sports is to inform the physical education community and addiction treatment professionals of the historical basis of doping in sport and its spread to vulnerable athletic and non-athletic populations.

Keywords: Doping, Sport, Steroids, EPO, HGH, Adolescents, Performance Enhancement

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Introduction

The use of drugs to enhance physical performance and muscular development has been observed for thousands of years. Today individuals continue to employ a wide variety of drugs in the hope of improving their athletic performance and physical appearance. In this competitive world every athlete want to achieve the Olympic motto, Citius, Altius, Fortius some with fair or some unfair means .That why athlete use medicine or that method which are prohibited in sports in or out .that drugs include in doping You may have heard this word used in sporting circles and in the media. While some of what you know about doping might be true, it is important to know the facts.

The word 'Dope' comes from the Dutch word "doop" (a thick dipping sauce) that entered American slang to describe how robbers stupefied victims by mixing tobacco with the seeds of *Datura stramonium*, known as jimsonweed, which contains a number of tropane alkaloids, causing sedation, hallucinations and confusion. Doping in sports is not a new phenomenon; Arthurian knights supposedly drank magical potions from the cup of Merlin. The Ancient Olympics in Greece were filled with corruption and doping to such an extent that the games had to be dissolved. In Ancient Rome, gladiators used to drink herbal infusions to strengthen them before chariot races and going into battle.

Early History

The use of drugs to enhance physical performance has been a feature of human competition since the beginning of recorded history (Prokop, 1970; Strauss & Curry, 1987). The goal of the user most often was to increase strength or overcome fatigue. Today we classify such drugs as anabolic and stimulants. The ancients learned empirically of the anabolic and androgenic function of the testes by observing the effects of castration on domesticated animals (Newerla, 1943). Furthermore, the ancients as well as people of the medieval period indulged in organ therapy (the eating of the organs of animals and humans) to cure disease and to improve vitality and other aspects of performance (Newerla, 1943). As early as 1400BC, the *Susruta* of India advocated the ingestion of testis tissue to cure impotence. Likewise, the ancient Egyptians accorded medicinal powers to the testicles (Hoberman & Yesalis, 1995). A heart may have been eaten to promote bravery

And the brain to improve intelligence. Testicular extract was prescribed by Johannes Mesue the Elder (777-837) as an aphrodisiac (Rolleston, 1936). The works of Aretaeus (1854) the Cappadocia (ca. AD150) portend the endocrine function of the testis, in particular the anabolic and androgenic effects of testosterone: For it is the semen, when possessed of vitality, which makes us to be men, hot, well braced in limbs, well voiced, spirited, strong to think and act. . . . But if any man be continent in the emission of semen, he is bold, daring, and strong as wild beasts as is proved from such of the athlete as are continent. . . . *Vital Semen*, then, contributes to health, strength, courage, and generation (Aretaeus, 1854: 346-7).

"Doping is the administration to or the use by a competing athlete or any substances foreign to the body or any physiological substances taken in abnormal quantity or by on sole attention of increasing in an artificial and unfair manner his performances in competition".

WADA

"New definition given by WADA"

Define as the occurrence of one or more of anti-doping rule violations mentioned in the world anti-doping agency code.

WADA HISTORY

WADA was establishing on Nov 1999 in Lausanne. It is an entirely unique hybrid organization that is governed and funded equally by the sports movements & governments. In present 35 labs WADA accredited labs in all over world in Asia only 6 labs.

WADA PROHIBITED DRUG LIST OR SUBSTANCES OR METHOD BANNED FOR USE IN SPORTS

ANABOTIC-STEROID:

TESTOSTERONE: The presence of testosterone to epitestosterone ratio of more than four to one [4:1] in the urine of a competitor constitutes an offence unless there is evidence that this ratio is due to the physiological or pathological condition.

NANDROLONE: A close chemical cousin of testosterone may be present in normal people -0.6 ng/ml of urine WADA set a limit of 2 ng/ml for men/women.

DEHYDROEPIANDROSTERONE(DHEA): It is a natural hormone produced mainly by the adrenal gland. It is released when the adrenal cortex gets a message from ACTH "adrenocorticotropic hormone". ACTH is released by the pituitary gland of the brain.

ANDRO-STENEDIONE: Androstenedione and related compounds are used in an attempt to increase testosterone concentrations. It is naturally produced in the body. Its conversion to testosterone, which in turn is converted to estrogen, may be responsible for increased cancer risk among women.

HORMONES &RELATED SUBSTANCES:

Peptide hormones act as a message from one organ to another to stimulate growth, influence sex drive and behavior.

ERYTHROPOIETIN: EPO is a glycoprotein produced by the kidney that functions to regulate red blood cells (RBC) production. EPO is used specially by endurance athletes to increase aerobic endurance with effects similar to that of blood doping.

HUMAN GROWTH HORMONE: HGH is a hormone that is synthesized and secreted by cells in the pituitary gland located at the base of the brain. The major role of HGH in body growth is to stimulate the liver and other tissues to secrete insulin-like growth factor. It is prohibited both in or out of competition.

BETA-2 AGONISTS: All beta-2 agonists include their D and L isomer and are prohibited. Their use requires a therapeutic use exemption. These drugs are used clinically for the treatment of asthma. Selective beta-2 agonists except salbutamol, formoterol, salmeterol and terbutaline are banned because their effects are rapid (1-2 minutes).

DIURETICS: They are produced that have potential to impair the excretion of prohibited substances. Diuretics are drugs that increase the rate of urine formation. Clinically, diuretics are used to control hypertension to reduce edema and as an adjunct in treating congestive heart failure.

STIMULANTS: This group of drugs includes psychomotor stimulants, sympathomimetic amines and miscellaneous CNS stimulants. They may produce alertness, wakefulness and increase and increase in the ability to concentrate.

NARCOTICS: Narcotics are derivatives of opium, derived from the poppy plant. This group consists of powerful painkilling drugs. Its use, misuse and abuse potential in sports may be high because of pressures on the athletes to perform competitively despite varied muscle-skeletal injuries.

CANNABINOIDS: It is a psychoactive chemical in the cannabis plant. Marijuana and hashish come from the cannabis plant. Marijuana is made from the dried flower and leaves of the plants. Hashish is small blocks of dried cannabis resin and is more potent than marijuana.

GLUCOCORTICOSTEROIDS: It is a substance which is able to reduce inflammation and so are used to treat conditions such as arthritis, asthma and may fever. They are naturally occurring drugs which are related to adrenocorticosteroid hormones and released from the adrenal cortex.

BETA-BLOCKERS: Beta-blockers are substances which reduce blood pressure and are effective in the treatment of heart problems by decreasing the output of blood from the heart. These drugs are used to try to stop the hands and the body from shaking while competing in sports such as shooting and archery that requires accuracy and a steady hand.

PROHIBITED METHODS

ENHANCEMENT OF OXYGEN TRANSFER: Blood transfusion is the intravenous administration of RBC or related blood products that contain RBC. Blood doping represents a method of increasing the hemoglobin concentration of blood in order to increase the amount of oxygen that can be transported to the working muscles.

ADMINISTERING ARTIFICIAL OXYGEN CARRIERS

PLASMA EXPANDERS: It is used to increase the volume of plasma in the blood. They are mainly used in medicine to replace fluid in case of severe shock, as may occur with blood or fluid loss in surgery. Some athletes may use PEX in an attempt to mask the effects of EPO.

ARTIFICIAL OXYGEN CARRIERS: It is a chemical used to increase the ability to carry extra oxygen in the blood. There have been some reports of athletes using these products in an attempt to increase the oxygen capacity of their blood.

GENE DOPING:

Gene or cell doping is defined by the WADA as "The non-therapeutic use of gene", genetic elements or cells that have the capacity to enhance performance. Gene therapies developed for the treatment of disease such as anemia, muscular dystrophy, peripheral vascular disease are potential doping method.

Summary

Because of the competitive nature of our culture and, in some instances, lucrative financial rewards, performance-enhancing drug use has diffused to a variety of other sports and activities. For example, there appears to be an eerie parallel between the spread of anabolic steroids in various types of horse racing with that of their use in human athletics (Cotolo, 1992). As with human athletics, rumors and accusations abound that performance enhancing drug use is epidemic in horse racing, while others say the problem is overstated; some say drug testing is behind the times and make mention of 'designer' drugs, while others argue that testing is working; some critics say a 'get tough' policy for cheaters is long overdue, while others propose that drug use should be allowed, but in a controlled fashion; and some veterinarians even argue that anabolic steroids really do not confer a competitive advantage (Cotolo, 1992). Modern sports and the media's misplaced fixation on fame, fortune and winning at all costs have unintentionally created a growing market for doping substances. These substances, once only abused by elite athletes, are clearly spreading into our schools and health clubs worldwide. They are being accepted by a whole new generation of young customers who see reports daily in the newspapers of sports icons accused of abusing drugs only to continue playing, breaking records and claiming fortunes. These same performance-enhancing drugs are also abused by adolescents and weekend athletes and non-athletes who have wider behavioral and health risk problems. In addition, these drugs are now being abused by male and female adolescents for cosmetic purposes in an attempt to achieve the "cut" and sexy look promoted by the media. Continuing educational programs developed for these at-risk populations by national Olympic organizations and athletic federations are important first steps to curb these dangerous behaviors.

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