Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
July 2024 5(7SE), 64–67

# A WAY TOWARDS DOPING IN SPORTS: CHALLENGES AND ADVANCES

Dr. Mohammed Ajaz Sheikh [1]

[1] Director of Physical Education and Sports, D. B. Science College, Gondia, Maharashtra, India

https://crossmark.crossref.org/dialog/?doi=10.29121/shodhkosh.v5.i7se.2024.5840&domain=pdf&date_stamp=2024-07-31

**DOI**
10.29121/shodhkosh.v5.i7SE.2024.5840

**Funding:** This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.



## ABSTRACT

Doping is a public health problem, not just a problem in the professional sports community. It is a complex and ancient phenomenon, due to the wide range of substances transported through both legal and illegal trade routes. It occurs in elite athletes, but it also affects recreational athletes and was generally considered dangerous and unhealthy.It directly affects sports and competitions around the world. Blood doping refers to the misuse of certain substances to increase the mass of red blood cells so that the body can transport more oxygen to the muscles and thus improve the performance and endurance of a player or person. It lists many life-threatening side effects of blood doping, such as increased blood viscosity, myocardial infarction, embolism, stroke, infections, allergic reactions and a certain risk of blood-related diseases such as HIV, hepatitis, etc. Anti-doping policies established by individual sport's governing bodies may conflict with local laws. There is no such connection between these authorities and the laws of the government. Today players use many techniques and drugs, which makes it difficult for them to be detected by experts and in the fight against doping. However, it is our duty to fight against them by updating information and events.

**Keywords:** Doping, Sports, Physiology, Health Issues, Oxygen

## 1. INTRODUCTION

Today, doping is a critical issue in sports physiology at the international level. Honest team spirit in sports competitions is affected not only by health problems, but also by the moral and ethical values of humanity. It directly affects sports, competitions around the world. Initially, the term "doping" was limited only to blood doping. But today the doping industry is growing so much that existing tests are becoming useless for doping detection.

Medicines are designed and developed for medicinal purposes and aim to benefit the human physiological system. However, it is well known that drugs can have unwanted side effects that can sometimes be harmful to the patient's health. Therefore, regulatory agencies around the world require complex and rigorous scientific and clinical evaluation of all drugs intended for medical use. However, the competitive nature of sports sometimes encourages athletes to use illegal drugs to create an unfair advantage over competitors, but in such cases, detailed studies are not conducted to assess the benefits and dangers of such drug use. That is why it is necessary to curb the abuse of drugs in sport, which today is called doping. The International Olympic Committee (IOC) took the first steps in this matter in 1967, publishing a list of prohibited substances and methods consisting of five groups: sympathomimetic amines, stimulants of the central nervous system, narcotic analgesics, depressants and major sedatives. Antidepressants and major sedatives were

removed from the list a year later. In 1976, after the Winter Olympics in Innsbruck, anabolic steroids were added to the list. In 1984, the use of exogenous testosterone was monitored based on a test that measured the ratio of testosterone to epitestosterone in urine. In addition to the use of prohibited substances, the use of pharmacological, chemical and physical manipulations was also observed in 1988, when probenecid was found to effectively reduce urinary concentrations of many anabolic steroids. At the same time, the use of diuretics and blood transfusions were prohibited. The next major change came in 1989 when several hormones were banned, including human chorionic gonadotropin (HCG), ACTH, and human growth hormone (hGH). Erythropoietin (EPO) was added to the prohibited list in 1990. In 1999, the IOC held an international anti-doping conference that led to the creation of the World Anti-Doping Agency (WADA), an organization supported by both. sports and government officials. WADA published its first Prohibited List in 2004 and continues to do so every year.

The International Olympic Committee declares it illegal and unethical. These committees take strict action against such cases from time to time. This organization always makes extreme efforts for doping-free sports. Doping is widely used by athletes to improve their performance without fear or knowledge of its consequences or side effects. Those practices not only reduce the quality of the sport but can be considered part of the corruption of the sport that affects the spirit of the sport. Blood doping is the abuse of certain substances to increase red blood cells, which allows the body to transport more oxygen to the muscles and thus increase the performance and endurance of a player or person. This can be achieved either directly using either erythropoietin (EPO), synthetic oxygen carriers or direct blood transfusion. The first documented organized doping controls were carried out in the 1970s. In 1993, the Czech Anti-Doping Act was signed, and the Anti-Doping Committee was established. The Medical Committee of the International Olympic Committee regularly decides and declares which substances and methods should be banned.

**1)** Hormonal abuse in sport: steroid and peptide hormones and their modulators, stimulants, glucocorticosteroids, beta2-agonists, diuretics and masking agents, drugs and cannabinoids, hormones are largely responsible for the largest number of adverse analytical findings reported by anti-doping laboratories.

**2)** Blood doping: WADA (World Anti-Doping Agency) defines blood doping as the systematic misuse of techniques and/or substances to increase the number of red blood cells. It is used either autologous or homologous. In most cases, this means removing two units of the athlete's blood several weeks before the competition. The blood is then frozen 1-2 days before the competition, when it is thawed and injected back into the athlete. This is called autologous blood doping. Homologous doping is the injection of fresh blood from another person directly into the athlete.

**3)** Use of artificial oxygen carriers: Another method of blood doping involves the use of artificial oxygen carriers. Hemoglobin oxygen carriers (HBOC) and perfluorocarbons (PFC) are chemicals or purified proteins that have the ability to carry oxygen. They were developed for therapeutic use but are now used as performance enhancers.

Medical use of blood doping: Artificial oxygen carriers are the only form of blood doping that has a significant medical use. They were developed to be used in emergency situations when there is not enough time to determine and compare the blood group of the patient for transfusion, when there is a high risk of infection, or simply when blood is not available.

## 2. GENE DOPING

The discovery of the complete human genome, which contains about 30,000 different genes, will lead to new possibilities for the diagnosis and prevention of many different diseases. In addition, this information can be used to design new therapeutic uses, including gene therapy, based on DNA sequence data (Doessing et al., 2005; Mazzeo, 2017). Gene therapy can be defined as the transfer of genetic material into human cells to treat or prevent diseases or disorders. Its principle is based on the delivery of a therapeutic gene to a cell, which can compensate for a missing or abnormal gene (Unal et al., Mazzeo e Volpe, 2017). This material can be encapsulated in a virus, such as an adenovirus or retrovirus, or in a lipid, such as a liposome. Viruses are paralyzed so they are no longer pathogenic. Encapsulated genetic material is usually called a vector and is delivered by direct injection into the target organ or as an aerosol into the lungs (Lippi et al., 2009; Doessing et al., 2005). It is also possible to extract cells from the patient and treat these cells with a vector in the laboratory and then re-implant them into the patient. Gene therapy is currently an experimental therapy and its use is strictly regulated (Gaffney et al., 2007; Beerens et al., 2003).

## 3. DISCUSION

Blood doping is most often used by endurance athletes, such as distance runners, skiers and cyclists. By increasing the number of red blood cells in the blood, there is a greater amount of hemoglobin protein. Hemoglobin binds and transports oxygen from the lungs to the muscles, where it can be used for aerobic respiration. Therefore, blood doping allows extra oxygen to be transported to working muscles, resulting in higher performance without using anaerobic energy systems. Several studies have shown that blood doping can improve the performance of endurance athletes.

## 4. DOPING AND INDIA

An analysis published in October 2012 by the Zee Research Group states that doping involving performance-enhancing drugs has a negative impact on morale, ethics and competitiveness in modern sports. Doping has affected sports worldwide, including in India.6 The National Anti-Doping Agency (NADA) in Bangalore introduced blood sampling and testing in India in 2010 in conjunction with the 2010 Kabaddi World Cup. 7 Awareness of doping in both international and national sports is growing in India. This is a promising fact observed in Indian doctors, players and officers. Side effects of blood doping: Listed are life-threatening side effects caused by blood doping, such as increased blood viscosity, myocardial infarction, embolism, stroke, infections, allergic reactions and certain circulatory risks. such as HIV, hepatitis, etc. Erythropoietin and Blood

Doping: Erythropoietin (EPO) is a naturally occurring hormone secreted mainly by the kidneys, which plays an important role in regulating the production of red blood cells. The use of EPO began in the 1980s as a faster and cleaner alternative to blood doping. EPO testing only became possible after 2000. Testing can be done with both blood and urine samples. Erythropoietin is primarily used by endurance athletes, such as long-distance runners and cyclists.

## 5. DOPING - NEW CHALLENGES

German doping expert Mario Thevis recently explained more than 100 specific performance drugs that cannot be detected. According to him, they are very difficult to detect due to their structural properties.8 It is very difficult to develop tests against these drugs.

**Figure 1**

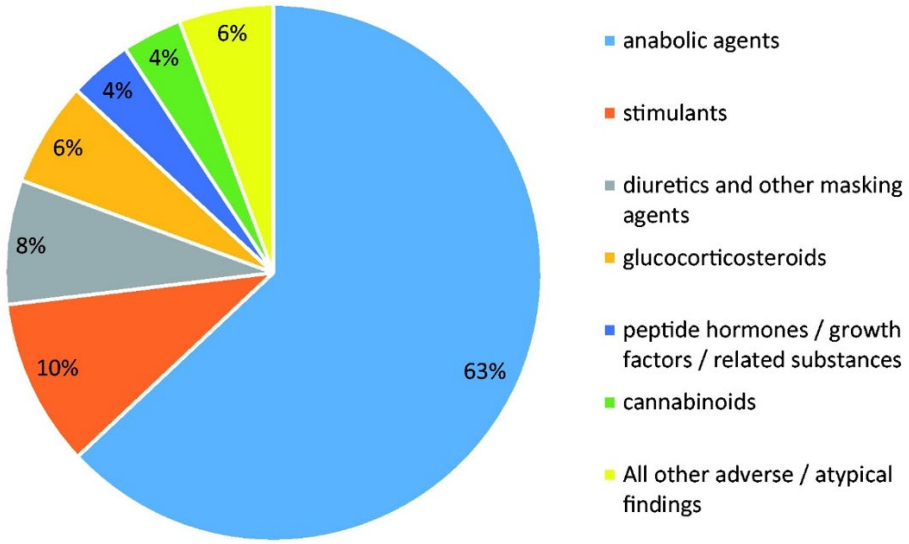


**Figure1** Doping in sports: health and clinical issues

## 6. CONCLUSION

Players today use many techniques and drugs that are very difficult to detect by experts and for the fight against doping. However, it is our duty to fight against them by updating information and events. Today, doping is a critical issue

in sports physiology at the international level. It is not only about health issues, but also about the moral and ethical values of humanity, which affect the honest team spirit of sports competitions. It directly affects sports, competitions around the world. Blood doping refers to the misuse of certain substances to increase the mass of red blood cells so that the body can transport more oxygen to the muscles and thus improve the performance and endurance of a player or person.

## CONFLICT OF INTERESTS

None.

## ACKNOWLEDGMENTS

None.

## REFERENCES

Teach Exercise Science: http://www.teachpe.com/drugs/epo.php ; Downloaded 1 /12/2012

Belson, Ken, N.F.L. Series of Congressional Help on Drug Policy, New York Times, (2009-11-0). http://www.nytimes.com/2009/11/0 /sports/f ootball/0 starcaps.html?_r=1andhpw. Alirita the 27th May 2010.

Jeschke J, Nekola J, Chlumský J. Doping in sport. Cas Lek Cesk 1999 May 10;138(10):291-7.

Hartgens F. Medicines, athletes and doping regulations. Ned Tijdschr Geneeskd. 2008 Aug 16; 152(33):18 -8.

Lippi G, Guidi G. Doping and sport. Minerva Med. 1999 Sep; 90(9): 3 5-57.