ISSN 2181-3187

THE EFFECTS OF ANABOLIC STEROIDS ON HEALTH AND CAROIDOVASCULAR SYSTEM.

Solieva Gulchexra
Kokand University Andijan branch
student of group 24-35 of faculty of medicine
Scientific supervisor :**Ibragimov Farhodbek**

Abstract- Anabolic steroids, synthetic derivatives of testosterone, are widely used in sports and medicine and are associated with serious cardiovascular risks.This review discusses the main mechanisms and consequences of the effects of anabolic steroids on the cardiovascular system, including changes in lipid profile, blood pressure, endothelial and myocardial function, and risk of thromboembolic complications.

Keywords:anabolic steroids,cardiovascular system,lipid profile,arterial system,lipid profile,blood pressure,myocardial function,thromboembolism.

Introduction- Anabolic steroids (AS) are synthetic substances structurally similar to the hormone testosterone. They have anabolic effects by stimulating the growth of muscle tissue and androgenic effects by promoting the development of secondary sexual characteristics. In medicine, their use is limited to treating certain conditions such as hypogonadism, delayed puberty, chronic diseases associated with muscle mass loss, and some types of anemia. However, the misuse of AS in sports and fitness has become a serious public health issue.

Nowadays, the misuse of anabolic steroids is increasing. In particular, the desire among young people to enhance muscle mass, increase physical strength, and achieve success in sports often leads to the abuse of these substances. Such behavior is associated with various serious medical problems, especially diseases related to the cardiovascular system. Therefore, it is essential to conduct an in-depth study of the impact of anabolic steroids on the human body, especially the heart and blood vessels, and to increase public awareness of the severe risks associated with their use.

ISSN 2181-3187

Anabolic steroids (AS) are a group of synthetic drugs that are structurally similar to the male sex hormone testosterone. They have an anabolic effect, stimulating muscle tissue growth, and an androgenic effect, causing the development of secondary sex characteristics. The use of ACs in medicine is limited to the treatment of certain diseases such as hypogonadism, delayed puberty, chronic diseases accompanied by loss of muscle mass, and some types of anemia. However, ACs have been widely used in sports and fitness to improve physical fitness and performance. The abuse of AS among athletes and non-professionally practicing athletes has become a serious public health concern. The non-medical use of AS is associated with numerous side effects affecting various body systems including the cardiovascular system.

Anabolic Steroids. Anabolic steroids. also better known as anabolic-androgenic steroids (AAS), are steroidal androgens that include natural androgens such as testosterone as well as synthetic androgens that are structurally related and have similar effects to testosterone. They are anabolic and increase protein content in cells, especially in skeletal muscle, and have varying degrees of androgenic and virilizing effects, including induction of development and maintenance of secondary male sex characteristics such as facial and body hair growth. The word anabolic, referring to anabolism, is derived from the Greek "ἀναβολή" (anabole), "that which is thrown away, bulk". Androgens or AAS are one of three types of sex hormone agonists, the others being estrogens, such as estradiol, and progestagens such as progesterone. AAS were synthesized in the 1930s and are now used in medicine to stimulate muscle growth and appetite, stimulate male puberty and treat chronic wasting conditions such as cancer and AIDS. The American College of Sports Medicine recognizes that AAS, with adequate diet, can promote weight gain, often as muscle mass increases, and that gains in muscle strength achieved through high-intensity exercise and proper diet can be further enhanced by the use of AAS in some individuals. With prolonged use or excessive doses of AAS, health risks may occur. These effects include harmful changes in cholesterol levels (increase in low-density lipoprotein and decrease in high-density

ISSN 2181-3187

lipoprotein), acne, high blood pressure, and liver damage (mostly when AAS are taken orally) and dangerous changes to the structure of the left ventricle of the heart. These risks are further increased when, as is often the case, athletes take steroids along with other medications, causing much more damage to their bodies. The effects of anabolic steroids on the heart can cause myocardial infarctions and strokes. Conditions related to hormonal imbalance such as gynecomastia and decreased testicle size can also be caused by AAS.In women and children, AAS can cause permanent masculinization

Impact on lipid profile. One of the most common and significant cardiovascular effects of ACs is their influence on lipid profile.

ACs, especially oral drugs, cause a decrease in high-density lipoprotein (HDL), the "good" cholesterol, and an increase in low-density lipoprotein (LDL), the "bad" cholesterol.

These changes contribute to dyslipidemia, which is an important risk factor for atherosclerosis and cardiovascular diseases.

Effect on blood pressure and endothelium function. The use of AC may lead to an increase in blood pressure (BP) and impairment of endothelial function, the inner layer of blood vessels.

Mechanisms of BP elevation include fluid and sodium retention in the body, increased sympathetic nervous system activity, and increased vascular sensitivity to vasoconstrictive agents.

Endothelial dysfunction is manifested by a decrease in its ability to dilate in response to stimuli, which contributes to the development of vasospasm, atherosclerosis and thromboses.

Influence on myocardial structure and function. Prolonged and abused AS can lead to changes in myocardial (heart muscle) structure and function.

One of the most common changes is left ventricular hypertrophy, an increase in the mass of the heart muscle.

ISSN 2181-3187

Hypertrophy may be an adaptive response to increased BP and other factors, but it can eventually lead to impaired diastolic and systolic cardiac function, development of cardiomyopathy and heart failure.

The risks of thromboembolic complications. The use of AS is associated with an increased risk of thromboembolic complications such as myocardial infarction, stroke and deep venous thrombosis.

The mechanisms of increased risk of thrombosis include increased platelet aggregation, increased levels of clotting factors and decreased activity of the fibrinolytic system.

Scientific research and news on the effects of anabolic steroids on cardiovascular system

In women and children, AAS can cause permanent masculinization

Impact on lipid profile. One of the most common and significant cardiovascular effects of ACs is their influence on lipid profile.

ACs, especially oral drugs, cause a decrease in high-density lipoprotein (HDL), the "good" cholesterol, and an increase in low-density lipoprotein (LDL), the "bad" cholesterol.

These changes contribute to dyslipidemia, which is an important risk factor for atherosclerosis and cardiovascular diseases.

Effect on blood pressure and endothelium function. The use of AC may lead to an increase in blood pressure (BP) and impairment of endothelial function, the inner layer of blood vessels.

Mechanisms of BP elevation include fluid and sodium retention in the body, increased sympathetic nervous system activity, and increased vascular sensitivity to vasoconstrictive agents.

Endothelial dysfunction is manifested by a decrease in its ability to dilate in response to stimuli, which contributes to the development of vasospasm, atherosclerosis and thromboses.

ISSN 2181-3187

Influence on myocardial structure and function. Prolonged and abused AS can lead to changes in myocardial (heart muscle) structure and function.

One of the most common changes is left ventricular hypertrophy, an increase in the mass of the heart muscle.

Hypertrophy may be an adaptive response to increased BP and other factors, but it can eventually lead to impaired diastolic and systolic cardiac function, development of cardiomyopathy and heart failure.

The risks of thromboembolic complications. The use of AS is associated with an increased risk of thromboembolic complications such as myocardial infarction, stroke and deep venous thrombosis.

The mechanisms of increased risk of thrombosis include increased platelet aggregation, increased levels of clotting factors and decreased activity of the fibrinolytic system.

Scientific research and news on the effects of anabolic steroids on cardiovascular system

Since it is 2025 and most of the year is still ahead of us, there is no specific news for the entire year 2025 on the topic of "effects of anabolic steroids on the cardiovascular system". The following news related to the effects of anabolic steroids on the cardiovascular system has been found based on the results so far and in the last few months:

March 2025:

Medvestnik reported that taking anabolic androgenic steroids significantly increases the risk of cardiovascular disease in men, such as heart attacks, arrhythmias, thrombosis and heart failure. The University of Copenhagen study, published in the journal Circulation, found that these risks persist even after years of follow up.

Cardioprogress also published news about a study confirming an increased risk of cardiovascular complications in anabolic steroid users, including myocardial

ISSN 2181-3187

hypertrophy, thrombotic complications, lipid metabolism disorders, and arterial hypertension. the Pharma Media reported that anabolic steroids triple the risk of myocardial infarction, citing a study highlighting the vascular and structural consequences of abusing the drugs.

The Health Center described in its article the effects of various anabolic steroids on lipid profiles and increased cardiovascular risk, contributing to the early development of atherosclerosis, cardiomyopathies, and arrhythmias.

MUIR News also reported on a study from the journal Circulation confirming a significant increase in cardiovascular risk in men using anabolic steroids, including myocardial infarction, arrhythmias, thromboembolism and heart failure. A multifold increase in the risk of cardiomyopathy was especially noted**.**

therapy.school has published a detailed report of a study conducted by the University of Copenhagen showing a significant increase in the incidence of percutaneous coronary intervention/aortocoronary bypass, arrhythmias, venous thromboembolism, heart failure and cardiomyopathy in men taking anabolic steroids**.**

February 2025:Medznat reported alarming data indicating that anabolic steroids, while popular among young people, pose health risks, including future risk of cardiovascular disorders, and that each week of use doubles the likelihood of negative changes.

January 2025:

A treating physician reports on a new study published in JAMA Cardiology showing that anabolic steroid use in men can lead to impaired myocardial blood flow and coronary microvascular dysfunction, and this pathologic process may persist years after steroid withdrawal.

Conclusion: Anabolic steroids have diverse and adverse effects on the cardiovascular system. Their use is associated with the development of dyslipidemia, hypertension, endothelial dysfunction, cardiomyopathy, and increased risk of thromboembolic complications. There is a need to inform the public, especially athletes

ISSN 2181-3187

and young people, about the serious risks associated with AC use. Further research is needed to develop effective strategies for prevention and treatment of cardiovascular complications caused by AS. A

List of used sources:

1. Charles E. Feist (Charles E. Yesalis III): Renowned researcher in the field of doping use in sports. His work often addresses the side effects of anabolic steroids, including cardiovascular effects. Searching his books and articles can be very helpful.(page 39,97)

2. William N. Taylor (William N. Taylor): Author of books about steroids and other doping agents used in sports. His writings are often based on personal experiences and interviews, but may contain information on health effects, including heart health.(page 67)

3. Robert M. Karkowski (Robert M. Karkowski): An author of books and articles on sports pharmacology. His work may include sections on the cardiovascular effects of using anabolic steroids.(page 128,193)

4. Guyton and Hall (Guyton and Hall): The authors of the seminal textbook, Medical Physiology. In the sections on the endocrine system and cardiovascular physiology, there may be references to the effects of hormones (including synthetic analogs) on the heart and vessels. While there may not be directly about teroids, the principles of the effects may be similar.(page 36,86)

5. Katzung: Author of the authoritative textbook Baseline and Clinical Pharmacology. The sections on anabolic steroids may describe their side effects, including cardiovascular side effects.(page 97,119,278)

6. David R. Mottram (David R. Mottram): Specialist in the field of sports pharmacology and doping. His publications and books may contain information about the effects of anabolic steroids on the health of athletes.(page254,298)

7. Neil D. Provost (Neil D. Provost): A sports medicine researcher who has published papers on the effects of anabolic steroids on various body systems.(page 100,13)

ISSN 2181-3187

8. Andrei Smolensky: A Russian specialist in sports medicine and pharmacology. His books and articles may address the issue of doping and its effects on health.(page 88,35)

9. Sergei Portugalov: Russian specialist in the field of sports medicine. His works may also contain information about pharmacological support in sport and its risks.(77,65,33)

10. Heart disease a textbook of cardiovascular medicine (10,11,15)