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POTENTIAL CARDIOVASCULAR SIDE EFFECTS OF TRENBOLONE ACETATE STEROID STACKING IN YOUNG RECREATIONAL BODYBUILDERS COMPARED WITH ANOTHER POTENTIAL CARDIOVASCULAR SIDE EFFECTS OF ANABOLIC STEROIDS AND WHAT IS THOROUGHLY HIDING BEHIND TRENBOLONE ACETATE ROID RAGE MYTH? (PILOT STUDY)

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Abstract: Aim: Health price of victorious and synthetic rapid muscle gain is never cheap. Many young recreational bodybuilders deceived by muscle dysmorphia search a shortcut to rapid muscle definition, muscle gain muscle hardness, tempted dally to involve steroids in their trainings cycle such as Trenbolone Acetate, one off the most effective metabolic violent steroids with very strong anabolic and psychopathologic potential (Roid Rage) considerably more stronger than testosterone promoting rapid muscle mass with relative muscle hardness and definition.

Subjects and methods: This study was conducted from beginning of June, 2019 till end of June, 2021 at the Clinic of Vascular Surgery, Clinical Center University of Sarajevo and included 72 subjects age 18-35 (37 subjects who have Trenbolone Stack in their anabolic steroids cycles and impellers group consisting of 35 subjects who have Trenbolone Stack in their anabolic steroids cycles) Potential Cardiovascular Side Effects are investigated For the testing of statistical significance of differences between the examined groups non-parametar and parameter tests were used. The difference at a level of $p<0,001$was statistically significant.

Results: In all tested subjects we investigated increasing potential damage of cardiovascular parameters age 17-30 years after two years study. Analysis shows the no statistically significant influence of cardiovascular damage in Trenbolone acetate group ($p<0,001$), compared to non Trenbolone acetate abuser group ($p<0,001$).

Conclusion: Anabolic steroid stacking have generally destructive cardiovascular potential abusing by young bodybuilder. Young bodybuilding Subjects who involved Trenbolone acetate in their steroid cycles compare with another anabolic steroids abuser group had bath significant devastating impact on cardiovascular system but significantly more psychosocial problems in trenbolone acetate group such as called Roid Rage.

Keywords: Anabolic Steroids, Cardiovascular Side Effects, Trenbolone acetate, Stacking effect

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INTRODUCTION

While a lot of medical and scientific is directed towards the use of conventional medicine for the patients, less attention is directed towards the misuse of the medicaments of anabolic steroid profiles on athletic-professional and Olympic level in terms of the quality of achieving certain athletic performances. A quiet epidemic of prevalence of intramuscular and oral application of anabolic medicaments in fitness and athletic clubs reached an alarming level of potential cardiovascular dangers and scientific myth of psycho-social personality deviation (Roid Rage) in young recreational bodybuilding population and it has become a subject of serious medical-social debate (1-3). A modern trend among young recreational bodybuilding population of the age between 17-30 is the use of steroid stacking (simultaneously use of several types of anabolic products) as a fundamentally and vital part of the recreational training process in order to achieve better athletic performance in various aspects (definition, power, muscle mass, fat tissue loss with muscle mass preservation) (4-7). Limitation of studies on the consequences of isolated anabolic products today is in a constant correlation because of the subjective effect of the stacking in many individuals, as well as black market overload with various products, differences in terms of the quality of products from different pharmaceutical companies, inability for a long-term observation, and frequency of medical check-ups which limit access to adequate data of the damage of endothelial function of cardiovascular system, cerebral system and level of peripheral circulation damage. Doctors do not always take into consideration a possibility of potential cardiovascular damages to young recreational in fitness clubs, and increased risk of myocardial infarction or brain stroke among excessive (irrational) usage of anabolic steroids (7). Often the symptomatology itself and clinical picture are clear and have no signs of radiological atherosclerotic damage and vasospasms of the coronary artery system, which is often underestimated, especially in athletes who are under doubt or have been using anabolic steroids for decades (8-12). Since the athletes subjectively look fit and have hypertrophy of muscle system, complications and damages to cardiovascular system have drastic consequences and are often inevitable. The frequency of coronary vasospasm, angina pectoris, cardiac disorders as well as the dramatic scene of myocardial infarction is increasingly present and expressed in younger population groups and very often masked by a subjective feeling of overload in certain muscular parts of the projection of vital organs (heart, lungs, liver, arterial and venous blood vessels), whereas in old, long-term addicts symptomatology may be more pronounced (13-19).

The abuse of anabolic steroids (synthetic testosterone derivatives) by healthy individuals far outweighs the application in the sick population, although the immune compromised sick population in some studies has profited in the form of improvements to the general condition, prevention of catabolism of severe general conditions of patients in intensive care, muscular atrophy, osteoporosis, as well as enhancements to the red blood cell image. Rational application of anabolics encompassed 30 HIV positive subjects on 600mg weekly dose of Nandrolone Decanoate (Deca Durabolin) in the period of 16 weeks with a slight decrease of High-density lipoprotein (HDL) with significant improvement of the hemogram and overall state of some patients (20). Due to their similarity to testosterone, inexperience, in practice doctors avoid administering anabolic steroids because of early cardiovascular risks; increased systolic and diastologous pressure, elevated hematocrit, increased risk of cardiovascular incident, thrombocytosis, polycythemia, deep vein thrombosis as well as increased LDL and decreased HDL with increased triglyceride values. The scientific fact is that cardiovascular damage to anabolic steroids is mainly associated with hyperlipidemia with aerobic maximal and submaximal stresses after decade users, and for these reasons inflammatory degeneration of the endothelium of the arterial wall occurs, with increased sensitivity of platelet adhesion to the increased risk of atherosclerosis on coronary and carotid arteries (21-23). Continuous decade use of various combinations of anabolic steroid includes risks of malignity increase of tumor tissue and psycho-social disorders (Roid Rage) alongside heightened mortality (24-26). Trenbolone acetate (17beta-Hydroxyestra-4,9,11-trien-3-one) is a derivative of Nadrolone as a trenbolone entanate and Trenbolone Hexahydrobenzylcarbonate and is an important factor in the proteosynthesis of any bodybuilding phase (competitive/post-competitive/mass). Its unique derivative of a similar chemical structure is very similar to testosterone (19-nortestosterone). However, its difference and advantage lies in the absence of 19th carbon. This absence of 19th carbon gives Nandrolone increased resistance to the aromatase enzyme, thus making it a tempting choice to resist any estrogenic activity. With the superiority of power, as well as modifications on the 11th and 19th carbon molecules, as a weak aromatization effect, it becomes a very attractive choice for beginners or long-term users alike. In the early 70's it found his place in cattle farming. Although it is not the primary choice in beginner steroid cycles, due to its chemical structure and effectiveness, Trenbolone acetate cannot be converted to estrogen, and has therefore attracted a great deal of interest in young athletes and bodybuilders as a benefit of the limited side effects (antiandrogen/anti-catabolic effect). With the effective subjective androgenic effect of trenbolone acetate somewhere between Nandrolone and Metandieon, based on the increase in muscle growth alone, it is more in favor of the effect of a cortisol suppressor without the loss of muscle strength on pre-competitive and competitive diets. Although the use of anabolic steroids in the young population is predominantly confidential, given that the limited data on the effects of the adverse cardiovascular effect of trenbolone acetate in young recreational users is less known to physicians and users, and therefore carries a large cardiovascular risk factor. Without supervisors and physician consultation on the general self-initiative administration of black market anabolic steroids, as well as modification of synthetic testosterone medical doses into sports, it carries a high threatening risk of a cardiovascular incident (27).

Aim Of The Study

The aim of this study is to gain insight into laboratory medical parameters in a young population of subjects aged between 20-30, beginners who use anabolic steroids with or without applications (trenbolone acetate) in combinations in the chemical form of trenbolone acetate with the indicated

permitted supplementation, and to obtain a laboratory medical as well as social insight into an individual's health and mental state, which is often hidden by subjectivity and cardiovascular asymptomatology. Based on the data obtained, we will have a three-year follow-up and try to divert the severity and attention of individuals to the severity of fatal harm to the cardiovascular and psychic system of the subjects, to improve or change preventive measures of the guidelines of the quality of sports activities, among the young recreational bodybuilding population, and thus to draw attention to avoidance of the potential and permanent cardiovascular disability. We aim to draw attention to the cardiovascular damage of the stacking effects of Trenbolone acetate, as well as the dangers of general stacking of anabolic steroids in the younger population and to draw attention of today's physicians who are not aware of the threatening cardiovascular incidents suffered by black market drugs.

Subjects Population And Methods

The research concept includes a retrospective-prospective multicenter study over a three-year follow-up period (June 2019 - June 2021) that included a total of 72 subjects who used and did not use trenbolone acetate in their steroid cycles. The study group consisted of 37 subjects and a control group of 35 subjects aged 17 to 30 years. The mean in the study group was 22.56 years and 24.89 in the control group, and they were included in the annual recreational anerobic fitness program (weightlifting and/or use of devices for individual or systemic muscle groups with maximal and/or submaximal repetitions of 3-10; 4-6 times for 80 to 160 minutes per week, without competition motivation, with the concept of training to achieve subjective muscle mass and muscle strength of proportional definition, as well as with periodic cycles of catabolic diets between cycles. Oncology, coagulopathies, hemophilia, or any other cardiovascular diseases (angina pectoris/arrhythmia) in the background were not recorded in all subjects. All respondents were given the concept of freedom of nutrition, which also included the occasional traditional national Bosnian fast food with the freedom to use nutritional supplements of their choice in the form of daily, weekly, or monthly dietary styles with periodic monitoring of caloric intake and dietary restriction. The aerobic training concept during the two-year test (bicycle/treadmill/orbitrec) was not recorded in either the subject or the control group. Lipid status parameters of all 72 subjects were optimized through supplementation (unsaturated fatty acid) diet modification and were as follows.

Researching Anabolic Stacking Groups

ANABOLIC STACKING 1 group: (37 subjects HDL >1.00±0,03 mmol/L, LDL-a <3,60 ±0,76 mmol/L and overall cholesterol <6,5mmol/) subjects who used and use trenbolone acetat in their anabolic cycles with cleansing periods of 6±2 months per year. The systolic and diastolic pressure parameters before and after the cycle with trenbolone acetate free choice of stacking were also measured.

ANABOLIC STACKING 2 group: (35 subjects HDL >1.00±0,17mmol/L, LDL-a <4,10±0,29 mmol/L and overall cholesterol <6,5mmol), who have not used trenbolone acetate in their anabolic cycles with a cleansing period of 4±2 months per year. The parameters of systolic and diastolic pressure before, after and during the cycle without the use of trenbolone acetate and free stacking were also measured.

Statistical presentation of the result is presented and processed in IBM SPSS ver. 25, by IBM Corp., and presented through tables and charts, p value less than 0.05 was taken as a measure of statistical significance. All subjects did not have high blood pressure before the study; their lipid status was in the reference values. An ethical and health informative interview was held with all subjects, with the written consent of the individual about a potential self-initiatory impairment of health. None of the research team suggested the subjects to self-initiated application, nor to administer anabolic steroids either in intramuscular or oral form. The informative interview was repeatedly conducted on the potential and proven cardiovascular damage, so that each subject was thoroughly informed about the ethical and health side as well as the separate and combined damage of Trenbolone Acetate prior to the self-initiated application about the possible potential side effect of anabolic steroids. The total number of subjects who completed the study is 67 subjects (5 subjects were reported during the study as Lost to follow up. 3 subjects in the 1st stacking group and 2 subjects in the 2nd stacking group.) Also, all initial parameters in all examined and control groups are recorded after a cleansing period of 6 ± 2 months.

RESULTS

In total 72 subjects were analysed and two tested groups were similar in number of subjects, gender and all of them were Caucasian. Mean age didn’t significantly differ between groups. Average ACC Carotid intima media thickness was very similar without any significant difference. When lipid profile was compared we have concluded that trenbolone acetate group had significantly higher values, p<0,05. All characteristics in tested groups are represented on table 1.

Table 1. Characteristics in groups with/out stacked Trenbolone Acetate

Variable	Group		
	Stacking I group	Stacking II group	p
Total subjects	37	35	
Men & Caucasian	37	35	
(Mean Age /Years in groups)	27,4 ± 1,34	27,9 ± 1,67	0,264
Acne steroidicae	7	6	
Average years of stacking anabolic steroids before study	1,72±0,26	1,81±0,12	0,066
Cleaning period under 6 months in year (subjects)	23	26	0,775
Cleaning period over 6 months in year (subjects)	3	5	0,723
Cleaning period under 3 months in year (subjects)	11	5	0,211
Trenbolone Acetate 50-100mg/ml IM	37	0	
Average dosage of Trenbolone Acetate 75mg/ml i.m	29±0,02	-	
(Methandrostenolone) 25-50mg oral aplication	34	30	0,707
(Oxandrolone) 30mg-50mg oral aplication	10	28	0,005
(Stanozolol) intramuscular aplication	28	22	0,479
(Stanozolol) 35 i 75 miligrama / oral aplication	32	29	0,797
(Nandrolone Decanoate) IM	23	22	0,997
(Testosterone Cypionate) mg 500-700 IM	2	4	0,423
(Testosterone Propionate)mg 250-500 IM	34	27	0,158
Sustanon (250-300) intramuscular aplication	29	30	0,615
Tamoxifen Citrate 10- 20mg (oral aplication)	12	12	0,743
Anastrozol 0,5-1mg mg every day (oral aplication)	3	2	0,948
Creatin Monohidrat 5gr (one or twice per day)	26	26	0,906
BCAA 2:1:1/ 3:1:1/ 4:1:1	34	35	0,473
Preworkout (ones per day)	16	16	0,979
Glutamin (ones or more per day)	31	32	0,532
L-Arginin (ones or more per day)	18	17	0,818
Taurin (ones or more per day)	3	2	0,948
Fat Burnner (one per day)	19	19	0,808
Vitamins A,B,C,D (Omega 3-6-9 suplemetation)	2	2	0,647
Magnesium (one per day)	2	1	0,961

Two selected groups were very homogenous, even their supplementation program was very similar. Almost all of them use Whey protein daily. Furthermore 13% subjects in group that used trenbolone also used egg protein, and 8% in group without trenbolone supplements. Other characteristics of their nutrition are shown on table 2.

Table 2. Protein supplemention in groups with stacked Trenbolone Acetate

	Group		
Variable	Stacking I group	Stacking II group	P
Whey protein (ones or more per day)	36	34	0,498
Egg protein(ones or more per day)	5	3	0,770
Casein Protein (ones or more per day)	18	16	0,989
Multi compo protein (ones or more per day)	2	2	0,647
Milk protein (ones or more per day)	0	4	0,109
Milk and Egg protein (ones or more per day)	0	1	0,977

Influence of supplementation on blood pressure was analyzed. Before stacking and supplementation mean systolic and diastolic blood pressures were similar, without any significant difference. Average diastolic blood pressure was somewhat higher in group that later took trenbolone, but without statistical difference. Interesting is that values of systolic and diastolic blood pressure had increased in both groups, even during stacking process, but that elevation was significantly higher in group that took trenbolone, $p<0,001$. Values of blood pressure are represented in table 3.

Table 3. Evaluation of Blood pressure and lipid status after two years

Variable	Group		P
	Stacking I group	Stacking II group	
Lost to folow up duing study	3	2	
Before Stacking Mean Systolic BP (mmHg)	132,3±8,7	129,8±6,98	0,184
During Stacking Mean Systolic BP (mmHg)	144,7±4,3	132,4±4,67	<0,001
After Stacking Mean Systolic BP in groups(mmHg)	145,7±9,4	131,2±7,81	<0,001
Before Stacking Mean Diastolic BP (mmHg)	86,4 ± 5,83	83,8±6,42	0,076
During Stacking Mean Diastolic BP (mmHg)	90,3±8,92	84,5±3,84	0,007
After Stacking Mean Diastolic BP (mmHg)	92,5 ± 7,71	85,9±4,47	<0,001
Before Stacking Triglycerids 0,46-2,28 mmol/l	2,25±0,34	2,18±0,11	0,065
Before Stacking LDL low-density lipoprotein 1,55-4,53mmol/l	2,37±0,12	2,31±0,21	0,152
Before Stacking HDL high-density lipoprotein 1.03-1.55mmol/l	0,93±0,19	0,96±0,09	0,399
After Stacking Triglycerids 0,46- 2,28 mmol/l	2,55±0,21	2,11±0,48	<0,001
After Stacking LDL low-density lipoprotein 1,55-4,53mmol/l	4,67±0,12	4,51±0,35	0,011
After Stacking HDL high-density lipoprotein 1.03-1.55mmol/l	0,87±0,1	1,09±0,12	<0,001
Before Stacking ACC Carotid Intima-Media Thickness CIMT(mm)	0,62±0,07	0,63±0,11	0,645
Before Stacking BMI body mass index	26,4±1,8	25,5±3,9	0,208
After Stacking BMI body mass index	27,9	24,1	<0,001
After Stacking ACC Intima-Media Thickness CIMT (mm)	0,68±0,08	0,63±0,1	0,022
Acne steroidicae	6	7	

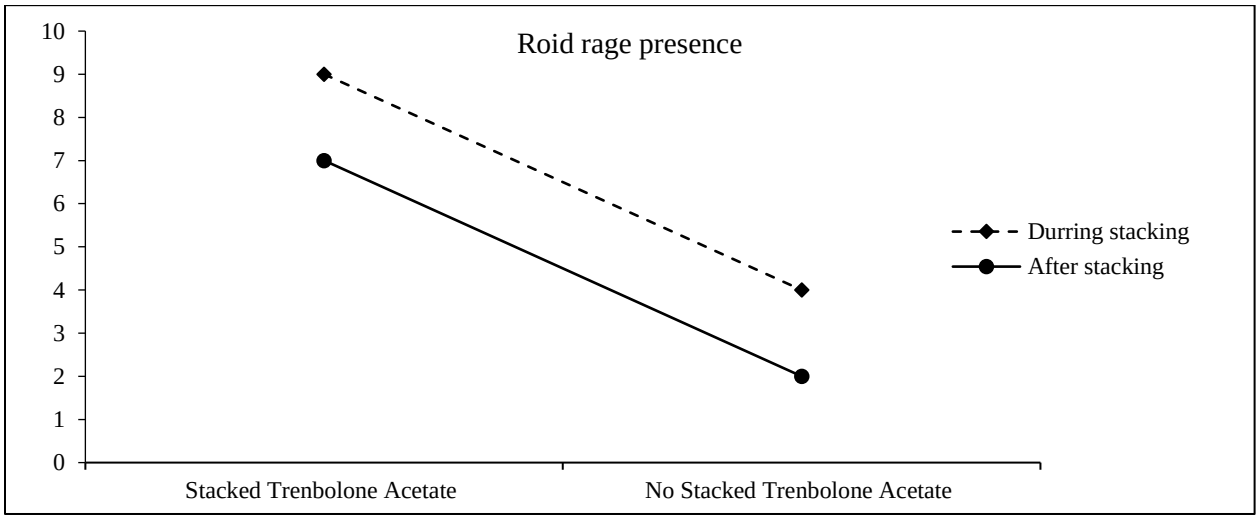
Average values of lipids are increased in group that used trenbolone from average 2,25 mmol/l to 2,55 mmol/l, with p<0,05. Also there are significantly higher values of triglycerides in group with trenbolone than in second group that didn't use this supplements (p<0,001). Also significant increase in LDL cholesterol was detected in both groups, while in group that used trenbolone that increase was statistically significant, p<0,011. Also HDL cholesterol level had decrease in group that used trenbolone, while in second group using supplements and exercise there was small increase in values. There was significant difference in HDL levels between two tested groups, p<0,001.

Psychological status was also analyzed, and it is found that in examined group Depression was present in 16,2% of subjects, while in group that didn't use trenbolone 8,57% of subjects had some depression symptoms. Also irritability during training cycles was present in 27,03% of subjects who used trenbolone, compared to 11,4% of subjects in other group (Table 4.) Insomnia was observed in 35,1% of subjects who used trenbolone, compared to only 5,7% of subjects that didn't used trenbolone, with significant difference p=0,002.

Table 4. Psychological status during and after two years

Variable	Group		
	Variable Stacking I group	Stacking II group	p
Post cycle Depression	6 (16,2%)	3 (8,57%)	0,479
During cycle Depression	2 (5,4%)	1 (2,85%)	0,94
Presense irritablity during cycle	9 (24,32%)	4 (11,4%)	0,222
Presense irritablity after cycle	10 (27,03%)	4 (11,4%)	0,137
Prence of Ginecomastia/Brust sweeling (Aromatization)	5 (13,5%)	4 (11,4%)	0,931
Water retention in other parts of body (arms/legs/belt)	2 (5,40%)	3 (8,57%)	0,669
Insomnia (sleeplessness)	13 (35,1%)	2 (5,7%)	0,002
Nocturnal Hyperhidrosis (Night sweats)	0	0	
Unpleasant emotion and feeling	5 (13,5%)	3 (8,57%)	0,711

Roid rage presence was detected in 9 subjects who used trenbolone during stacking, and 7 of them had them even after stacking procedure. IN group that didn't used trenbolone, roid rage presence was lower, but there wasn't any significant difference (p>0,05) (Figure 1).



Varicose veins (Grade I and II) were detected in two subjects who didn't used trenbolone, while only one subject who used trenbolone had varicose veins. There wasn't any significant difference (Fishers exact test=0,609).

DISCUSSION

The veterinary use indication successfully replaces the vacant magical commercial spot with the trend of today's sports magic of the Appolo transformation of the Trenbolone acetate application in stacking with other anabolic steroids that have been ignored and under estimated in the health and social problem of young bodybuilding athletes. Given the enormous quantitative diversity of the number of black market products of anabolic preparations, further research is needed to try to counteract the problem of quiet, profound and epidemic levels and provide more accurate and broader information about the side effects of the black market overgrowth that young recreationalists and their doctors are facing today. It is formerly expensive and hard-to-reach drug at the world-class level of elite athletes, now cheap, backward and on a professional and Olympic-level, overtaken commercially and very efficiently, and readily available by some young recreational athletes who are not involved in any competitive and/or amateur sport, and is the primary initial supplement in bodybuilding. Anabolic steroids have become widespread and are increasingly within the reach of ordinary young, inexperienced and under-educated people aged 18 to 35 in fitness clubs which are commercially enthralled by myohypertrophy subjection and rapid and effective muscle strength progression without some objective data and valid information about the potential side effects of self-stacking anabolic steroids (28). The epidemic problem of the distribution and administration of anabolic steroids is not only a problem in the male population but also in the female one.

Although in the control and study groups we had a statistical significance of the male sex of 72 subjects or 100% (p <0001), it was not excluded that, in addition to the permitted supplementation, the female bodybuilding population applied, in a much smaller number, forbidden pharmacological agents for recovery. Studies are needed to confirm this fact scientifically (27). Young bodybuilding athletes rarely have the difficulty of getting to the required anabolic preparations and the use of the product does not usually stay on one product. The two most common causes of high overdose 10 and up to 50 times the recommended sports application of anabolic steroids is the possibility of a cardiovascular incident, myocardial infarction and/or cerebrovascular insulitis (6,22,27,29). There are many pathways that guide applications of anabolic steroids. For most young athletes, the route leads through dealers, experienced and old consumers (usually power lifters, bodybuilders or weightlifters) with already muscular proportions or media celebrities who are suspected of applying forbidden products. Thus young bodybuilders are driven blindly through an alley that has its own health price (30, 31). Blood pressure (systolic and diastolic) is also elevated in high-stress athletes (maximal and submaximal stresses). This phenomenon of pathological compensation of the organism is often monitored and acceptable in individual recreational athletes with over 25 BMI and from the physician's point of view. What would make young users stop consuming an anabolic steroid cycle application besides the late cardiovascular and other consequences that accompany an individual in late life? From the socio-psychological point of view, little is known and few studies have been done on this topic. There are hints, but not statistically proven claims, that if a user has been administering steroids for over a year, they will most likely be used all their life in any type and form. Thus, potential users and participants of criminogenic activities, and further investigations are needed to substantially accept this claim from the scientific point of view (32,33). Short use of

anabolic steroids, with or without combinations of Trenbolone acetate results in acne, sterility, changes in serum lipid levels (HDL/LDL and triglyceride, as well as total cholesterol), but are reversible while masculine effects such as hairiness by the body, enlargement of the clitoris, changes in the vocal cords and acromegaly are permanent. Anabolics cause a generalized risk for cardiovascular incidents; however, few studies have addressed collecting data on the cardiovascular effects of stacking anabolic steroids in combination with Trenbolone acetate (14). Trenbolone acetate is not a tempting choice for the use of steroid cycles in fitness clubs at the level of Bosnia and Herzegovina for beginners, because of its multifunctional effect, and is not the first choice to build primary muscular tissue during the construction phase. To this end, the Soviet steroid cycles of the USSR and cycles from the old DDR in combination with some of the synthetic options of a politraic or long-acting effect in the variant esters of Tetstosterone, Stanozolol and Methandrostenolone (Dianabol or Methandienone-Methandrostenolone) are widespread at affordable prices as well as the possibility of longer application, and have a more subjective effect. Experienced individuals use stacking with other anabolic steroids, and have the apparent benefits of 50-75mg doses. Some use up to 100mg in combination with testosterone propionate 100mg daily, Stanozolol 50mg daily or Sustanon 250-350mg, during the phase of cutting or calorie reduction stage. Oxandrolone is the least abused by the young bodybuilding population, and if anabolic abuse is not attractive to rehabers, there is no change in the haemostatic system due to its high potential for hypercoagulopathy, a decrease in fibrinolytic activity. High effects of Oxandrolone on Plasminogen have been reported and plasminogen activator inhibitor-1 (PAI-1) significantly affects the increase in liver coagulation factors II and V with the elevation of liver enzymes that accompany the administration of all anabolic preparations in comparison to stanozolol, which increases fibrinolytic activity while reducing plasminogen activator inhibitor -1 (PAI-1). In practice, it has been observed that most recreationalists who used stanozolol experienced more extreme myotonus than other substances, and that some recreationalists who used stanozolol in their cycles experienced injuries at the levels of symptomatology and clinical imaging of tendon-muscle junctions without scientific confirmation of the subjective statements of individuals themselves (34,35,36). Side effects of trenbolone acetate have been reported in samples from rats in the form of reductions in serum lipids HDL, LDL and triglycerides. Serum lipids HDL and LDL were significantly reduced by 57%, 62%, and 78%, respectively ($p < 0001$), and benign prostatic hyperplasia was observed, which included a 6-week study in the study group. Positive effects of body fat reduction were also observed by 37±6%, which was respectively significant ($p < 0001$). Insulin sensitivity has also been confirmed alongside the absence of evidence of a cardiovascular profile (37-40). The potential side effects of stacking Trenbolone acetate in combination with any testosterone ester, as well as the symptomatology and asymptomatology of elevating systolic and diastolic pressure as a negative effect on serum lipids (HDL, LDL levels) after the study and presentation of the results are of no concern for young recreationalists, because the subjectivity of masculinity, myohypertrophy, strength, and the momentary extremely positive psychophysical feeling that trenbolone acetate gives is at the most important for them. Cardio exercises in the form of preventive protection of cardiovascular system compensation do not have some subjective individual application sense in young bodybuilding recreationalists. Cardiovascular damage caused by stacking is particularly localized on carotid and coronary arteries in the form of endothelial dysfunction of the intimal wall and elasticity of the artery, as well as accelerated fat deposition, which is often not initially detectable in diagnostic tests (CT-angiograph /color Doppler/MRA) (19) in the form of calcium deposits, especially for younger users, due to the very degree of the pathology of arteriosclerosis. Asymptomatology of dyslipidemia and endothelial damage, as well as evidence of progression of systemic arteriosclerotic fat deposition to other systems, remain hidden for a long time until the fatal occurrence of the cardiovascular incident itself (6,7,9,14). Gynecomastia and the onset of water retention is certainly an undesirable side effect that young recreational bodybuilders encounter, and the use of aromatase inhibitors was abused in any stacking group (with or without trenbolone acetate). The use of aromatase inhibitors on the subjective side of the loss of anabolic steroid side effects in the form of subcutaneous water deposits to express muscle proportions was justified individually and subjectively by the subjects, however, with the additional opposite cardiovascular counter benefit to the detriment of recreationalists. The question arises whether the use of aromatase inhibitors doubles and to what extent they increase the risk of cardiovascular atherosclerotic pathology, predictors of progression of atherosclerosis pathology in the form of Carotid Intima-Media Thickness (CIMT), as well as cardiovascular incidents on different vascular systems with various anabolic product combination cycles in the young recreational bodybuilding population (40-43). Anabolic steroids adversely affect the levels of HDL and LDL and total serum cholesterol, especially the ratio of HDL and LDL with a potential elevation of triglyceride above 2.28 mml/l at any stage of administration (intramuscular/oral) or stage definition or mass (steroid bulking cycle or steroid cutting cycle). However, the various stacking cycles of different combinations of anabolic preparations with or without Trenbolone acetate with certainty of cardiovascular incidence through different case studies increase mortality and permanent disability in younger populations (22). Although triglyceride levels below 10 mg/dl (0.11 mol/L) and HDL from 3 mg/dl (0.08 mmol/L) to 5 mg/dl (0.13 mmol/L) scientifically can be controlled, returned to referent values and significantly improve by physical activity, diet restriction and modification while controlling for risk factors, non-anabolic users still have a contradictory opinion about double risk due to the influence of various combinations of anabolic steroids, and enhanced effects of Trenbolone acetate with Testosterone propionate/cypionate or some other testosterone-rich esters of testosterone (Sustanon 250-350) synthetic or medical (TRT) testosterone replacement therapy to lower HDL and increase LDL (44-46). For these reasons, young recreational users who use various stacking combinations and cycles of anabolic preparations on their own initiative should use high oral doses of daily supplementation of polyunsaturated fatty acids over 10 grams as additional cardioprotective measures (aerobic or different interval training) with additional consideration of the simvastatin application itself, atorvastatin

and/or acetylsalicylic acid (ASA) due to the progression of atherosclerosis. The question is why beginners immediately apply stacking (combinations): Stanozolol, Metadienone-Methandrostenolone (Dianabol), Nandrolone Decanoate and necessarily some form of Testosterone propionate/cypionate, possibly more testosterone ester combinations (Sustanon / testosterone mix 250-400). The only sense is in a self-initiated testosterone application that acts both anabolic and androgenically depending on serum testosterone levels, and whether the combination of different substances is the only pathway to impregnated muscle mass and why it is combined when each steroid has its opportunistic effect (Nandrolone anabolic base steroid and Metadienone is more androgenic). All steroids act individually in a more anabolic and less androgenic way or vice versa, and we conclude that (stacking) or a combination with any anabolic steroid with or without a combination of trenbolone acetate loses all rationalization of a sports recreational training concept and process. Also, all young recreational athletes without motivation to compete in bodybuilding competitions are potential victims of the epidemiological commercialization of black market anabolic steroids (27-29).

CONCLUSION

We can safely say that the general (Stacking) combination of anabolic steroids, especially in combination with trenbolone acetate, as well as other black market anabolic steroids, presents a strong cardiovascular destructive effect in the form of early-stage arterial hypertension, as well as HDL-lowering hyperlipidemia, LDL increase and total cholesterol increase. Young individuals who misuse Trenbolone acetate tend to go through a periodic adynamic personality structure with dysfunctional behavior with limited data on permanent psychiatric impairment, and increase the threatening potential of a cardiovascular incident as a progression of generalized arteriosclerosis of young male recreational bodybuilding population, who are potential candidates for surgery and/or conservative medical treatment of a wide range of cardiovascular etiology symptoms.

Conflict Of Interest

The authors declare no conflict of interest.

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