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EFFECT OF CARDIO EXERCISES ON THE HORMONE IRISIN CUMULATIVE BLOOD SUGAR AND BODY MASS INDEX AMONG RETIRED ATHLETES

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Abstract:
The study aimed to identify the effect of high-intensity cardio exercise on the hormone iricin, cumulative sugar and body mass index among the research sample members. The researchers adopted the experimental approach for its suitability and the nature of the research phenomenon to be studied. They identified their research population in a deliberate way, namely the retired football players over the age of (40) years and the number of (15) retired players. The researchers concluded that cardio exercises raised the level of erycine measurements and the active cycle of metabolism and reduced the level of cumulative glucose measurement; there was an improvement in body mass index and a decrease due to the effect of cardio exercises.

Keywords: cardio exercises, hormone irisin, cumulative blood sugar, body mass index

1. Definition of the Research

1.1 Introduction and Importance of the Research

The practice of recreational and sports physical activities has received wide attention in research and studies and their clear scientific products on the positive health and functional effects of developing the physical aspects and biological competence and upgrading them to the highest levels to a degree commensurate with the capabilities of individuals, their age stages, health conditions and various sports specialities.

The physical activities related to the health aspect have become a given, and the inevitable basics that every person must enjoy an appropriate amount of them, which enables him to practice the requirements of his daily life with constant activity and vitality to maintain physical fitness to gain consistent body mass and ideal weight, to

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reduce the phenomenon of obesity (obesity) that leads to negative changes in all body functions and vital organs, so it is considered the main nerve and the cause of many diseases in our time and threatens the health of the individual.

In order to pay attention to the health of all segments of society, including retired athletes in particular, we must reduce the accumulation of body fat that causes the phenomenon of obesity, it has become necessary to practice physical activities regularly to affect the increase in energy metabolism by changing the balance between its inputs and consumption after the stage of sports retirement, and its implementation according to modern scientific means that are easy to apply with the available capabilities, so the cardio training method is effective more in causing changes in the overall organic functions of the individual, as he depletes glucose in the body and begins the process of burning fat and losing weight to maintain ideal body mass in a shorter time and less effort than the traditional methods used.

The study derives its importance as it is one of the rare studies that dealt with a segment of retired athletes, as their health was targeted after the stage of sports retirement in highlighting the responses of the hormone irisine, cumulative sugar rate and body mass index, due to the method of forming high-intensity cardio exercise loads, which we find from the appropriate training methods for the training of those who retire sports, because the phenomenon is worthwhile and the extent of its benefit to employ its results in raising the health level of this segment of society.

1.2 Research Problem

The level of inaction to practice sports activity and the low allocation of leisure time enough for physical and recreational exercise to gain general fitness, which is some of the causes of high body fat as it is one of the most important and largest major problems, and its inevitable result causes an increase in obesity rates significantly among retired athletes after the stage of sports retirement, which threatens their infection with diseases that threaten their health life, and this is what prompted the researchers to ask the following:

- What is the level of change in iricin, cumulative sugar and body mass index when cardio loads are applied in the target group in the research?

1.3 Research Objective

- Identify the effect of high-intensity cardio exercises on the hormone iricin, cumulative sugar and body mass index among the members of the research sample.

1.4 Imposition of the Research

- High-intensity cardio exercises affect the hormone iricin, cumulative sugar and body mass index among the research sample members.

2. Research Methodology and Field Procedures

2.1 Research Methodology

The researchers adopted the experimental approach for its suitability and the nature of the research phenomenon to be studied.

2.2 Research Community

The researchers identified their research community in a deliberate way, namely the pioneering football players (retired athletes) who are obese of the first degree above (30) body mass index, and there number is (15) retired players and their percentage was (100%), in order to obtain a sample characterized by accurate scientific specifications that the researchers need in the implementation of their research procedures, they subjected the community to clinical examination, and some analyzes By a specialized health staff, to ensure that the players are free of any health problems (chronic diseases) that may affect the results of the study, and the researchers also took into account the homogeneity element of community members for the following variables (height - body mass - chronological age) as well as the equivalence of the study variables, which include (iresin, cumulative sugar, body mass index), and it was found that there is clear homogeneity and equivalence in those variables.

2.3 Field Research Procedures

2.3.1 Procedures for Measuring Biochemical Variables in Blood

In order to measure the analysis of the biological variables of the study (hormone iricin, cumulative sugar), (3 ml) of venous blood was withdrawn from the members of the research community at rest, by a specialized medical staff in the Middle East laboratory using medical syringes volume (5 ml), and the blood was placed in a special tube prepared for the purpose of preservation after shaking it to mix with (Trisodium citrate). to prevent coagulation, and then the blood was separated by the centrifuge to obtain plasma, so that the biochemical variables in the blood can be analyzed through special cuts, as the process of analyzing the variables studied by the (ELISA) device technology was done and programmed after the kit for each variable is placed according to the instructions of its manufacturer.

2.3.2 Main Experience

After obtaining all approvals for research ethics for retired athletes, where the members of the research community knew the importance of the study and the extent of benefit from it, they expressed their agreement to cooperate with the researchers and implement their research procedures, and after completing all preliminary procedures, starting with the results of clinical examination and laboratory analysis, which resulted in the safety of the community and their enjoyment of complete health, after performing the blood draw at rest for biochemical measurements of blood and tribal body mass index. On Thursday, 2/11/2023 at ten o'clock in the morning, the researchers began to carry out the doses of training loads for cardio exercises on members of the research community, as the

duration of the application of the exercises reached (12) weeks and by three training units per week for the days (Sunday, Tuesday, Thursday) with a total of (36) training units from 5/11/2023 to 25/1/2024, and commensurate in its content and the nature of the pioneering football players (retired athletes) with obesity of the first degree, and the gradient was increased by increasing the intensity of the load and the use of tools and assistive devices that correspond to them taking into account the differences between them, and after the implementation of the prescribed period of time from the application of cardio training, the blood draw was performed for dimensional measurements of blood biochemical variables and under the same conditions on Saturday, 27/1/2024 at four o'clock in the afternoon.

2.4 Statistical Treatments

The researchers used the statistical bag (SPSS) version (23).

3. Presentation and Discussion of Results

3.1 Presentation of the Results of Measuring the Variables of Irisine, Cumulative Sugar and Body Mass Index

Table 1: The arithmetic means, standard deviations, calculated (T) value, significance level, significance differences in measuring the variables of irisine, cumulative sugar, and body mass index (pre-post) for the experimental group

Statistical Treatments	Unit of measurement	Going to	±	Calculated value (T)	Sig	Significant differences
Irisine						
Southern	ng/ml	83.66	1.03	9.80	0.000	Moral
Go away		101.3	5.08			
Cumulative sugar						
Southern	%	6.13	0.24	8.85	0.000	Moral
Go away		5.38	0.27			
Body mass index						
Southern	kg/m2	31.18	0.73	9.61	0.000	Moral
Go away		28.37	0.93			

3.2 Discussion of the Results of Functional Measurements

3.2.1 Discussion of the Results of the Measurement of Irisine

The researchers believe that the secretion of the hormone irisine increased its concentration in the examinations after the effort than before it is its relationship and functions associated with physical effort, and the role of the hormone factor in raising the rate of metabolism and reduces the resistance of the hormone insulin, which allows glucose sugar and face in cells, including muscle, and that this resistance is caused by the increase in the fat mass of muscle cells, and this interpretation is consistent and consistent with all previous studies, which confirmed that "*the hormone irisine is the main regulator of muscle metabolism during physical exercise*." (Park KH, 2014) & (Sanchis-Gomar, 2014) & (Seo DY, 2014) & (Yazgaldi Nazari, 2019) & (Arias-Loste MT, 2014) & (R. R. Kraemer,

2014) as well as "*moderate increases in irisine lead to increased metabolic rate and insulin resistance in adipomyocytes induced by physical physical activity*." (Muaz Belviranli, 2016) & (Seda Uğraş, 2020) & (Yun Lu, 2016) & (Ji-Hyeon Kim, 2018) & (Dennis Löffler, 2015) & (Håvard Nygaard, 2015) & (Nathan C. Winn, 2017) & (PS Rejeki, 2021)

The researchers also argue that the increased secretion of the hormone irisine in the blood plasma before and after the effort after the program, to the nature of the formation of cardio loads carried out, which would increase the volume of repetitive muscle contractions and their inevitable need for more energy fuel. "*training has beneficial effects on metabolism and through increased metabolic activity resulting from energy consumption*" (Stengel A, 2010) & (Chen, N, 2016) and "*metabolic rates and overall energy expenditure values increase during exercise training*". (Jedrychowski MP, 2015) and "*Irisine plays an important role in energy metabolism for glucose production*". (Roca-Rivada A, 2013) & (Boström PA, 2014) The role of insulin and erysine, which were more effective in sugar metabolism compared to the results before the program, "*the effects of exercise on the hormones irisine and insulin have become common in energy regulation*." (Stella S Daskalopoulou, 2014) & (Nygaard H, 2015) This naturally leads to different biological reactions that work under exceptional conditions on all functional indicators as an internal load affected by the nature of the external load, and this explanation is logical and consistent with all previous studies that confirmed that "*the concentrations of irisine in the blood plasma indicate a state of elevation, so the hormone needs more energy increases in individuals practicing physical activities*." (Jose´María Moreno-Navarrete, 2013) & (Kraemer RR, 2014) & (Kurdiova T, 2014) as well as "*that a 12-week resistance exercise program was effective in increasing irresin levels in the blood plasma*". (Kim, 2015) & (Norheim F, 2014) "*while 10 weeks of endurance training caused an increase in the level of iricin in healthy adults plus athletes in the blood*." (Huh JY, 2012) & (Timmons JA, 2012) and "*that 10 weeks of exercise were associated with an increase in irresin secretion compared to no exercise*." (Dianatinsab A, 2020) while a study (Tsuchiya Y, 2014) & (Young Huh J, 2015) noted that "*resistance training has a more pronounced effect on elevated pervasive irricin levels compared to high-intensity interval exercise and moderate-intensity continuous exercise groups*." A study (Phillips C, 2014) & (Szuhany KL, 2015) "*endurance training athletes increased blood iricin levels*."

The researchers also believe that the concentrations of the hormone irisine in the blood plasma increased its secretion from skeletal muscles between measurements after the effort before and after the program, and these increases are due to the period of application of cardio exercises and the role of the hormone in the metabolism of fats in fat cells to increase the volume of muscle work. "*Skeletal muscle changes occur during physical exercise, which causes the hormone irricin to be released into the bloodstream located in adipose tissue cells*." (Wrann CD, 2013) & (Castillo-Quan, 2012) & (Kuster, 2017) The need to secrete irresin in larger quantities is highlighted, which plays an effective role in the metabolism of white adipose tissue into brown fat so that muscle cells can adopt it in energy production as the final product of adipocytes, and this explanation was consistent with all previous studies "*that exercise activates the work of irisine and leads to the stimulation of white adipose tissue similar to brown fat and convert it as energy*." (Bostrom P, 2012) releases

"*irisine from skeletal muscle and increases energy consumption by stimulating the conversion of white adipose tissue to brown*." Aidan S., 2014) & (Arhire LI, 2019) & (Brenmoehl J, 2014) & (Lawson EA, 2014) "*the brown fat trait has the ability to spend more calories than white, and it has been shown that irresin increases mitochondrial stimulation in browning white adipose tissue to consume stored fat*." (Polyzos SA, 2013) & (Yazgaldi Nazari, 2017)

3.2.2 Discussion of the Results of the Cumulative Glucose Measurement (HbA1c)

The measurement of cumulative sugar analysis (HbA1c) is one of the truest measurements as it gives a real reflection of the overall carbohydrate metabolic processes, which is stored in muscle cells in the form of glycogen as fuel for energy, muscle building, contraction and other organs, as studies and research indicated that the processes of stability and fluctuation of glucose sugar metabolism are inevitably reflected in the cumulative sugar index, and it gives a real picture of that, "*the measurement of carbohydrate metabolism in the blood is cumulative sugar (HbA1c) which gives a real picture of glucose metabolism for a period of three months*." (Anna K. Jansson, 2022) & (Ng CLW, 2010) & (Dunstan DW, 2006)

It was evident that there was a significant decrease in cumulative sugar (HbA1c) as a result of adopting the philosophy of approved cardio training, which formed training loads in a gradual scientific manner commensurate with the nature of the research sample members of the retired athletes, which was clearly reflected on the refraction of the cumulative sugar index and its imbalances due to the effect of the volume of muscle work carried out by the progress of physical efforts practice, which lasted three months, despite the steady increase in frequency with the need for muscle fibers to demand increased glucose. The researchers see this as a positive situation reflected in the rationing of the load of the doses of physical exercises carried out, which constitute an exceptionally severe burden in the decline of carbohydrate metabolism processes to replace glycogen with adipose mass as energy fuel for muscle cells and tissue to the latest balance of metabolic processes, which ensures better stability of organ work. For the performance of frequent contractions, this explanation is consistent with all previous studies that confirmed that "*physical activities direct muscle fibers to the consumption of glycogen and stored lipids in a balanced manner, and this is reflected in the imbalances of the cumulative glucose index*." (Ishiguro H, 2016) & (Liu Y, 2019) & (Benham JL, 2020)

3.3 Discuss the Results of BMI Measurement

It was clear that there was a steady significant decrease in the body mass index after the implementation of cardio training, which was cautious gradation with the formation of tighter loads and applied in a purposeful suspense method consistent with the nature of the research individuals and the change in lifestyle to reach them at the stage of breaking down and burning fat and consuming it as energy in light of the decline in the metabolic processes of glucose sugar, and the researchers explain it to the urgent need for the role of lipomass for cells and muscle tissue, as the pace of work of mitochondria increases in order to enhance its function to produce the necessary energy during physical exertion, and this In turn, it exposes it to the productivity of working more on the consumption of

fat mass, which contributed to the hormone irisine in the metabolism of white adipose tissue into brown fat and effectively led to a reduction in the body mass index by percentages we see consistent and all studies and research that advise the need to gradually reduce the mass of the particle in order to maintain the internal balance of the body in a way that does not allow events during the functional organs, and this interpretation is consistent and consistent with what was reported by the results of previous studies "*lifestyle changes must be made and physical activities must be encouraged. promoting the health of the individual*." (Mahzad Sanayei, 2022) & (Yan B, 2014) & (Pardo M, 2014) & (Swick AG, 2013) & (Moreno-Navarrete JM, 2013) & (Loffler D, 2015) & (Stengel A, 2013) "*regular physical activity and a healthy, balanced diet are important for weight control and obesity reduction*."

The researchers also emphasize that the indications of low lipid levels and percentages are due to the scientific method used in the formation of cardio training using auxiliary means and tools, as a result of the great effort in muscle fibers that consume large amounts of energy, which requires compensating them in larger quantities as a result of the shortage in their stores in order for the cell to perform its functional duties, and not to be exposed to stresses, so responses appear to stimulate the function of the hormone iricin, which targets white adipocytes, stimulates them and turns them into brown in color to raise The ceiling of the level of energy production thus increases the consumption of adipocytes, and this explanation was consistent and consistent with what was reported by previous research and studies: "*irresin increases the level of energy is a property in white adipose tissue known as a source of raising the metabolic rate of energy production after converting it to brown color to prevent obesity*." (Irving BA, 2008) & (Sillanpaa E, 2009) & (Crujeiras AB, 2014) & (Wu J, 2012)

The researchers believe that the above interpretations of the variables surveyed are evidence of proper planning for the philosophy of external pregnancy in the entirety of the training process with the means and training tools used, which misled the internal environment of the research personnel and through which the so-called internal load is achieved, which most of the literature agreed to describe as internal functional changes in the human body by the influence of an external load, and it is recognized that all training processes cannot achieve their objectives, unless a state of changes occurs In the functional indicators of the body, in another way, it is only a real reflection in reducing the lipomass index for its significant role in the metabolism of carbohydrates and fats.

4. Conclusions and Recommendations

4.1 Conclusions

1) Measurements of biochemical variables within normal limits among members of the research community.
2) Cardio exercises affected raising the level of irresin measurements and the active cycle of metabolism processes and reducing the level of cumulative glucose measurement.

3) There is an improvement in body mass index and a decrease due to the effect of cardio exercises.

4.2 Recommendations

1) Adopting cardio exercises to improve the study variables.
2) Adopting the results of the study variables as indicators of improving the functional organs and systems of the retired athletes.
3) The need to use modern training devices and tools that serve physical activities because of their positive impact on the process of improving study variables.
4) Conducting similar studies on other physiological variables in different age groups and for both sexes.

Conflict of Interest Statement

The authors declare that this research was conducted without any financial or commercial relationship may be considered a potential conflict of interest.

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