

The effect of aerobic exercise on the level of the hormone leptin in obese women

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Introduction and research problem

Obesity is one of the modern civil diseases that appeared to be inactivity, activity and dependence on the machine, which causes the emergence of diseases of lack of movement and this occurs due to the accumulation of fat in the body and this leads to difficulty in movement, loss of agility, fatigue of the joints and sagging of the muscles (8 : 176-177)

Leptin is expressed in many other tissues including the placenta, ovary, mammary epithelium, bone marrow, and lymph tissue (5: 33) .

Leptin is produced mainly from white adipose tissue, and its levels correlate positively with the amount of fat in the body (3: 5) .

Leptin works by binding to two leptin receptors (ObRs) that are expressed in the brain and surrounding tissues (4: 100) .

Leptin binding to its ObRb receptor activates several signal transduction pathways, including the signal transducer and transcription activator - 3 Janus kinase (Jak-Stat3), which plays an important atmosphere in the regulation of energy homeostasis. Phosphatidylinositol 3 kinase (Pi3k) is important for regulating food intake and glucose homeostasis (1 : 9) (6: 5) .

Circulating leptin serves as a measure of energy reserves and directs the central nervous system to control food intake and energy expenditure,

and leptin exerts direct effects by acting on the brain to regulate appetite, where leptin intentionally binds to the ObRb receptor in the hypothalamus region is a complex neural circuit made up of neuropeptides missing appetite Milano Cortin (POMC) and appetizing neuropeptides (neuropeptide Y (NPY)), thus it controls food intake, and leptin outside the hypothalamus in the brain interacts with each of the Mesolimbic, which contributes to stimulating feeding and the single-pathway nucleus of the brain stem that contributes to In the sense of satiety (7:42) .

Leptin not only signals the central nervous system to decrease food intake but may also increase energy expenditure (4: 134) .

In order to obtain positive results for the increase in the level of physical fitness as well as weight loss, increase the rate of fat metabolism and decrease the level of blood fats and decrease the level of blood fats, training must be done with a high training intensity at the maximum level of the training area where the maximum pulse rate is between 70-85% One of the lowest heart rate, and the number of times per week ranges between 3-4 times and for a period of continuation between 30:45 s per training unit (2: 233) .

The researchers state that obesity is linked to lack of activity, but it is not the only one, since the dietary behavior followed is a direct cause of obesity. The nutritional awareness of the importance of choosing food appropriate to human requirements predicts the health image of this person, so the more the individual is nutritious, the less likely he is. For obesity, where obesity is classified according to fat cells as this classification includes types of obesity, the first type is obesity characterized by an increase in the number of fat cells and this type appears in children and the number of these fat cells cannot always be reduced, while their size can be reduced, and obesity in childhood It determines the features of obesity in old age, and the second type is obesity due to the enlargement of the size of fat cells, and this is the common type in adults .

Deep positive and functional changes also appear in nerve activities as a result of regular physical training, as sports training leads to changes in the body, and these changes are two types of which are temporary, i.e.

changes that occur temporarily in response to the performance of physical activity, then the blood returns to its state at the time of rest, Some of them change with relatively continuity, which are changes that occur in the blood as a result of regularity in the exercise of sports training for a certain period, which leads to the adaptation of the blood to perform physical training. These changes include an increase in blood volume, hemoglobin volume and red cells.

From the above, the researchers find that the hormone leptin has a fundamental role in increasing body weight, and that women who are obese increase their numbers as a result of lack of sports activity and due to the conditions and nature of daily life and daily work and their role in domestic work increases the chance of weight gain, and this is what the researchers called to prepare the study entitled: The effect of aerobic exercise on the level of the hormone leptin in obese women .

Research goal:

The current research aims to study the effect of aerobic exercise on the level of the hormone leptin in obese women .

Research hypotheses :

In light of the research objectives, the researchers put the following hypotheses :

1. There are statistically significant differences between the mean of the ranks of the pre and post measurements for obese women in the biochemical variables, the hormone leptin, in favor of the post-measurement .
2. The percentage of improvement in the mean of the dimensional measurements differs higher than the pre-measurements of the sample group of the research hormone leptin .

Terms mentioned in the search :

Leptin hormone

It is a protein made of 167 amino acids, a fractional weight of 16 millo-dalton, is referred to by the ob gene, and leptin is associated with overeating, severe obesity and diabetes (9:32) .

Search procedures**Research Methodology**

The researcher used the experimental method by using the experimental design of one group and by applying pre and post measurement due to its suitability to the nature of the research .

Community and sample research

The research community is represented by women between the ages of 40-50 years of workers in the Directorate of Education in Minya Governorate, whose weight exceeds 90 kilograms, and obese women, and their number reached 148 women. The researcher selected the research sample randomly from the research community and it reached a total The research sample is 15 women with a percentage of 18.2% of the research population .

The proposed training program

- Total program time = 8 weeks .
- Total program time = 5 units per week .
- The number of weeks of the general preparation phase = two weeks .
- The number of weeks of the Special Preparation phase = 6 weeks .

Research operational steps**Exploratory study:**

The researcher conducted the physical tests on Monday, February 1, 2021, the application was repeated on Thursday, February 4, 2021, in order to ensure the validity and reliability of the physical tests, and the exploratory study aimed to train assistants on the tests and tools used.

The researcher also implemented a training unit (randomly selected from the proposed sports program) to ensure its suitability for the research sample and to ensure the safety and validity of the tools used in the sports program on Friday, February 5, 2021.

Pre-analogy :

The researcher conducted a pre-measurement for the research sample in the variables {leptin hormone / body components / physical variables} on Saturday, February 28, 2021 .

Implementation of the proposed program:

The proposed sports program was applied to the research sample from 1/3/2021 to 4/30/2021.

Telemetry :

The researcher conducted a post-measurement for the research sample after completing the application of the proposed mathematical program in the same way in the pre-measurement on Saturday, May 1, 2021 .

The statistical method used :

The researcher used the following statistical methods to suit the nature of the research (SMA / coefficient of torsion / Mediator / Wilcoxon Lab barometric test / standard deviation / Percentage improvement) .

The researcher satisfied a significance level (0.05). She also used the statistical program Spss, which is one of the ready-made statistical programs .

Presentation, interpretation and discussion of resultsThe results of the first hypothesis, which states:

There are statistically significant differences between the mean of the ranks of the pre and post measurements in obese women in the biochemical variables (leptin hormone) and in favor of the post measurement .

Table (1)

The significance of the differences between the average ranks of the tribal and posterior measurements for women Obese women in the biochemical variants under investigation (n = 15)

Variables	measuring unit	Pre-measurement and			post-measurement			Z value	Error level
		SMA	Average ranks	Total ranks	SMA	Average ranks	Total ranks		
Leptin Hormone	ng/ml	5.38	0.00	0.00	5.79	8.00	120.00	3.42 **	0.001

* D at level (0.05) ** D at level (0.01)

It is clear from Table (1) that:

- There were statistically significant differences between the mean ranks of the pre and post measurements for obese women in the biochemical

variables (leptin hormone) under study and in favor of the post measurement .

The results of the second hypothesis, which states:

The percentage of improvement in the averages of the dimensional measurements differs higher than the pre measurements of the sample group of the research hormone leptin .

Table (2)

The percentage change between the pre and post measurements
Of the affected women In obesity in
biochemical variants (leptin) (n = 15)

Variables	measruing unit	Pre-measurement and	post-measurement
Leptin Hormone	ng/ml	5.38	5.79

It is clear from Table (2) that:

- The percentage change between the pre and post measurements for obese women in the biochemical variables (Leptin hormone) was (7.62%), which indicates the positivity of the proposed program to improve the hormone leptin in women.

The researchers attributes that result to the proposed and regulated sports program that is commensurate with the physical and physiological condition of obese women (the research sample) and achieves its goal by improving the physical and physiological condition. The energy expended necessary to equal the effort required to be expended in the proposed sports program .

The researchers also attributes that the nature of aerobic exercises that lasts for more than twenty minutes, which leads to burning fat and thus improving body components, and these exercises are characterized by a low intensity, which makes the performance of exercises more easy and helps continuity, and if music is added to it, the lady's feeling of happiness and pleasure and continuing to train increases. The feeling of the program's positivity increases the ease of exercise in the program, which is characterized by its progression from easy to more difficult, and the performance appears smoothly and easily .

The researchers mentioned that sports training positively affects the hormonal system. This is what regulates the body's physiology during sports training. In this regard, Robertson et al. (2008) indicates that the leptin hormone is considered circulatory as a measure of energy reserves and directs the central nervous system to control food intake and energy expenditure. Leptin exerts direct effects by acting on the brain to regulate appetite (108: 42).

Conclusion

In light of the research results, the researchers reached the following conclusions :

1. The existence of statistically significant differences between the mean ranks of the pre and post measurements for obese women in the biochemical variables (leptin hormone) under study and in favor of the post measurement .
2. The percentage change between the pre and post measurements for obese women in the biochemical variables (Leptin hormone) was (7.62%), which indicates the positivity of the proposed program to improve the hormone Leptin in women .
3. Aerobic exercise has a positive effect in improving the level of the hormone leptin in obese women .

Acknowledgment

The researchers extend their sincere thanks and appreciation to everyone who contributed to the completion of this work on the fullest point, especially experts in the field in determining the determinants of the training program as well as the medical aspect of research appropriate to the nature of the sample. The researchers also offer sincere thanks and great appreciation to the research sample of female workers in the Directorate of Education in the Governorate Minya, which allowed the application of the research because of the time and information they allocated in order to produce the research in the desired form and the ability to achieve the desired goal .

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Research Summary

The current research aims to study the effect of aerobic exercise on the level of the hormone leptin in obese women, and the researchers used the experimental approach using the experimental design of the one group and by applying pre and post measurement due to its suitability to the nature of the research, the research community is represented by women between the ages of 40-50 years Of the workers in the Directorate of Education in Minya Governorate, whose weight exceeds 90 kilograms, and who suffer from obesity, and their number reached 148 women, The researchers selected the research sample randomly from the research community and the total research sample amounted to 15 women with a percentage of 18.2% of the research community, In light of the research results, the researchers reached the following conclusions :

1. There were statistically significant differences between the mean ranks of the pre and post measurements for obese women in the biochemical variables (leptin hormone) under study and in favor of the post measurement .
2. The percentage change between the pre and post measurements for obese women in the biochemical variables (Leptin hormone) was (7.62%), which indicates the positivity of the proposed program to improve the hormone Leptin in women .
3. Aerobic exercise has a positive effect in improving the level of the hormone leptin in obese women .

Key words

- Aerobic exercise .
- The hormone leptin .
- Obesity.

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