Assessment of the Levels of Irisin, Myonectin in Among Patients with Diabetes Type 2 in Kirkuk\Iraq

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Abstract
The aim of the current study is to estimate the concentrations of irisin and myonectin in people with type 2 diabetes, and the results of the study showed a significant increase (p≤0.01) in the concentration of irisin in people with type 2 diabetes compared with the healthy group without type 2 diabetes, according to age, the results showed a significant increase(p≤0.01)in the concentration of irisin, especially in the elderly with type 2 diabetes, and on the other hand, the results did not show a significant difference(p≤0.05) in the concentration of irisin in patients with type 2 diabetes who do exercise when compared with those with type 2 diabetes who do not exercise, and the results of the study showed a significant increase (p≤0.01) in the concentration of myonectin in type 2 diabetics compared with the healthy group without type 2 diabetes, according to age, the results showed a significant increase (p≤0.01) in the concentration of myonectin, especially in the elderly with type 2 diabetes, and on the other hand, the results show a significant difference (p≤0.01) in the concentration of myonectin in patients with type 2 diabetes who do exercise when compared to those with type 2 diabetes who do not exercise, and the study concluded that irisin and myonectin have an effect on patients with type 2 diabetes.

Keywords:Irisin, myonectin, type 2 diabetes, exercise

1. Introduction

Diabetes Mellitus is a metabolic disorder disease non homogeneous featuring with height in sugar concentration in the blood because weakness secretion of Insulin hormone or abnormal Insulin function or both, or it can be considered a chronic disease that greatly affects the vital fitness for the person. The high sugar level in diabetic patient associated with complications in blood vessels which effect on eyes,the kidneys and nerves, As well as increase the risk of cardiovascular disease, The criteria of Diabetes Mellitus diagnosis depends on blood sugar concentration that related to cardiovascular disease especially retinopathy [1, 2],According to the statistics of the World Health Organization, WHO to the presence of more than 171 million people with diabetes in the year 2000, and the number is likely to reach 366 million in 2030, meaning that there is an increase in the number of people with this disease and at risk of contracting this disease, and in Iraq, the percentage of infection for 2019 has reached to 13.9% of adults with diabetes [3, 4]. Many Studies are indicated to the relationship between drop irisin levels and Myonectin in the blood serum and resistance Insulin or diabetes disease and studies found drop irisin and Myonectin levels scattered in patients with type 2 diabetes [5, 6] and other studies found negative connection with levels cumulative glucose HbA1c [7, 8].And other studies focused on the organization irisin and Myonectin by insulin resistance and it is likely that involved irisin and Myonectin at metabolize fats and glucose, And therefore may be they prevent has evolved resistance insulin, and with that, may be affected secretion also evolving resistance Insulin at muscle, Because irisin and myonectin have been shown to function in adipose tissue, dysregulation may affect tissue cross-communication and further contribute to insulin resistance and impaired glucose and lipid metabolism [9].

2. Materials and Working Methods

Study design

This study was conducted for the period of October 2021until March 2022 in specialized clinics in the city of Kirkuk, which included 70 Patients with type 2 diabetes who attended specialized clinics, and their ages ranged from 35-65, as well as 20 person did not have any comorbid symptoms as a control group.

Blood samples

Blood samples were obtained from patients with type 2 diabetes, with a rate of 5ml. The blood was put into the test tube (Gel Tube) and leave it for a while 5 minutes at room temperature, then separate the samples by centrifugation for 15 minute at 3000 rounds per minute to get the blood serum.

Biochemical analyzes

Irisin and Myonectin

The basic principle for the determination of the concentration of ricin and myonectin, through the use of the analytical tool kit from the company Sunlong Biotech Chinese, and based on the latest enzyme-linked immunosorbent assay techniques ELISA.

3. Statistical analysis

The results of the current study were analyzed

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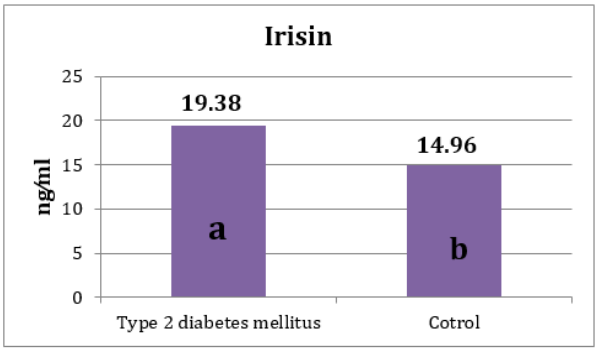
statistically, using the statistical program Chi-Square which ensures that the probability value is at the level p≤0.01,and not important that the probability value is at the level p≤0.05 insignificant changes [10].

4. Results and discussion

The concentration of irisin in patients with type 2 diabetes and the control group.

The results are shown as in the figure (1) highly significant (p≤0.01) in the concentration of irisin in patients with type 2 diabetes, as it reached (19.38±4.29) ng/ ml compared with the control group, as it reached (14.96±4.17) ng/ml.



The different letters mean that there is a significant difference at the level of (p≤0.01)

Figure (1) the concentration of irisin in patients with type 2 diabetes and the control group

Figure (2) shows no insignificant difference (p≤0.05) in the concentration of irisin in people with type 2 diabetes who exercise sports (18.70±4.27) ng/ml compared with people with type 2 diabetes who do not exercise (19.91±4.33) ng/ml.

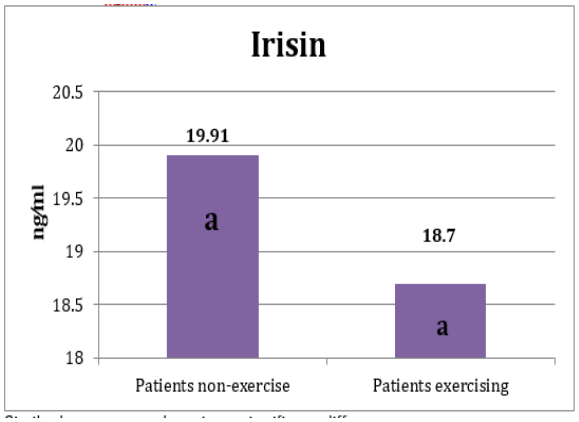


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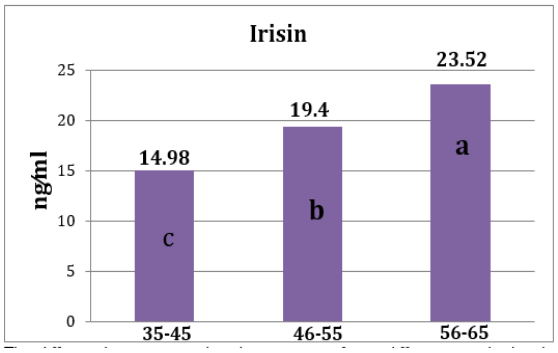
Figure (2) irisin concentration in type 2 diabetics exercising and non-exercisers

As for age groups, the current study shows in (Fig.3) there was a significant increase (p≤0.01) in the concentration of irisin in patients with type 2 diabetes in the age groups (46-55), reaching (19.40±4.27) ng/ml and the third (56-65), reaching (23.52 ± 4.49) ng/ml compared with the first age group (35-45), which was (14.98 ± 2.77) ng/ml.



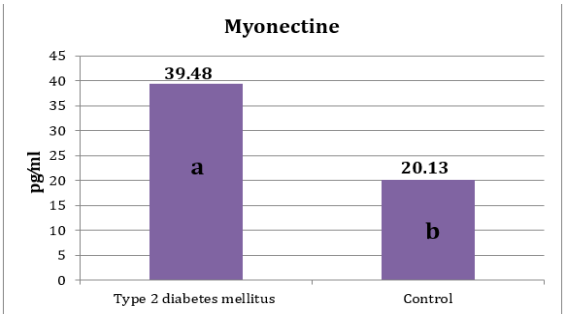
The different letters mean that there is a significant difference at the level of (p≤0.01)

Figure (3) Irisin concentration by age groups

The main reason for the high concentration of irisin is due to insulin resistance, which leads to an increase in the concentration of glucose in the blood, and this increase in glucose concentration causes a rise in the factor PGC-1α which leads to increased gene expression FNDC5.This results in an increase in the concentration of irisin in the blood, which was attributed to the presence of an increase in irisin level in diabetic patients with type 2 diabetes when compared to the control group [11-13].In the current study, a decrease in irisin concentration after exercising with high energy consumption and that decline at level irisin at people with diabetes from Type 2 whose are practicing Sports is called with resistance exercise [14, 15]. Exercising continuously has nothing to do with high concentrations of irisin in the blood serum, and studies indicate the relationship between exercise and irisin concentration, and it was found that vigorous exercise led to a rise in irisin levels immediately after exercise and after a period of rest, the ratio returned to decline, i.e. Between periods of exercise [16-18] and other studies have shown that aricin is secreted as a result of muscle contraction in response to physical exercise [16, 19], Irisin can be considered as a regulator of exercise and also its potential role in the therapeutic potential of type 2 diabetes and obesity [20] in age groups. It was found that there was an increase in the concentration of irisin in type 2 diabetics in the second and third age groups compared with the first age group, that is, a rise in the concentration of irisin in diabetics is among the elderly and this increase is achieved through moderate exercise [21].

Myonectin concentration in patients with type 2 diabetes and the control group

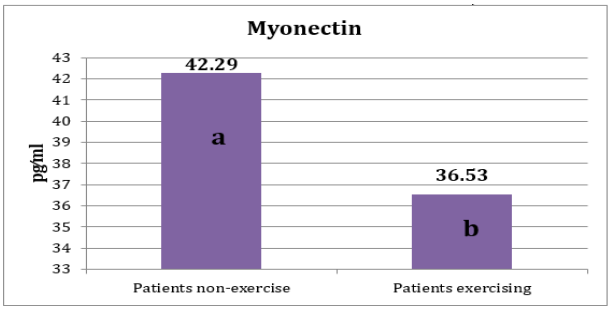
The results of the study in Figure (4) show a significant increase (p≤0.01) in the concentration of myonectin among people with type 2 diabetes, which reached(39.48±7.92) pg/ml compared with the control group, which amounted to (20.13±4.01)pg/ml.



Different letters mean there is a significant difference at (p≤0.01)

Figure (4) The concentration of myonectin in patients with type 2 diabetes and the control group

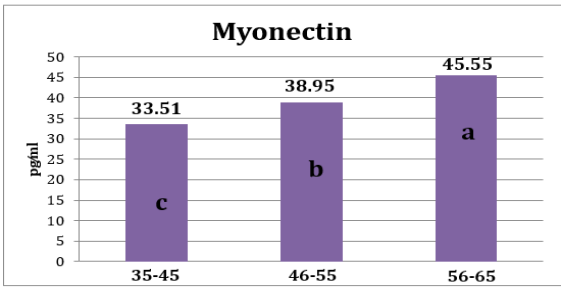
Figure (5) indicates that there was a significant difference (P≤0.01) in the concentration of myonectin among people with type 2 diabetes who exercised, as it reached (36.53 ± 8.29) pg/ml compared with those with type 2 diabetes who did not exercise, as it reached (42.29 ± 7.54) pg/ml.



Different letters mean that there is a significant difference at the level (p≤0.01).

Figure (5) Concentration of myonectin in people with type 2 diabetes who exercise and do not exercise

As for age groups, the results of the current study in Figure (6) show a significant increase (P≤0.01) in the concentration of myonectin in people with type 2 diabetes in the second age groups (46-55), as it reached (38.95 ± 7.95) pg/ml and the third (56-65) reached (45.55 ± 8.11) pg/ml compared with the first age group (35-45), which reached(33.51±7.11)pg/ml.



The different letters mean that there is a significant difference at the level of (p≤0.01)

Figure (6) Myonectin concentration by age groups

The increase in the concentration of myonectin in people with type 2 diabetes and who have insulin resistance as well as in those with heart disease. The high concentration of myonectin as an indication of the occurrence of heart disease, type 2 diabetes and metabolic problems [22] The high concentration of myonectin in people with diabetes is due The second type may be the result of muscle activity [23-25] No increase in the concentration of myonectin after exercise, It is possible that the levels of myonectin decrease after exercise, i.e. during the rest period, as is the case in irisin, i.e. what is called exercise resistance [26, 27]. The first age group, meaning the high concentration of myonectin in people with type 2 diabetes in the elderly [22, 26].

5. Conclusion

The results of the study showed an increase in the concentration of irisin and myonectin in patients with type 2diabetes.

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