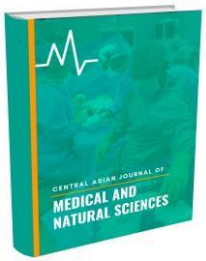

CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES
https://cajmns.centralasianstudies.org/index.php/CAJMNS
Volume: 05 Issue: 04 | October 2024 ISSN: 2660-4159

Article

Evaluation of Fat Levels in Obese Women with Diabetes in Kirkuk City

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Abstract: The goal of the current study is to estimate the concentrations of the levels of fats, as it includes the concentration of total cholesterol, triglycerides, high -density fatty protein, low -density fatty protein and very low -density lipoprotein in women with soft women and bodies with type 2 diabetes, the experiment has been conducted for the period since the beginning October 2023 until the end of March 2024. 90 samples were collected from women with diabetes with ages ranging from (20 years to 04 years) and these samples were collected from private laboratories and government hospitals. It was divided into four groups as follows: The first group: a group of healthy women, numbering: 15, the second group: women with diabetes, numbering 25, the third group: women with obesity, numbering 25, the fourth group: women with diabetes and obesity, numbering 25. The results of the current study showed a significant increase ($P \leqslant 0.01$) in the concentration of total cholesterol, triglycerides, low-density lipoprotein and very low-density lipoprotein in disease groups compared to control. And the presence of a significant decrease in the concentration of high-density lipoprotein in the pathological groups compared to the control group. We conclude from the current study to increase the concentration of total cholesterol, triglycerides, low -density lipoprotein, low -density lipoprotein, and a decrease in lipoprotein, very intense, in healthy women and bodies with type 2 sugar.

Keywords: Obesity and diabetes, type II diabetes, total cholesterol, triglycerides, lipoproteins

Citation: Abbood, J. J., & Al-Obaidi, W. M. L. Evaluation of Fat Levels in Obese Women with Diabetes in Kirkuk City. Central Asian Journal of Medical and Natural Science 2024, 5(4), 735-741.

Received: 16th Aug 2024
Revised: 23rd Aug 2024
Accepted: 30th Aug 2024
Published: 6th Sept 2024

1. Introduction

Diabetes Mellitus (DM) is a set of metabolic disorders that are characterized by high blood sugar as a result of defects in insulin secretion or work, or both most cases of diabetes diagnosis are classified into two main categories: type 1 diabetes and type 2 diabetes [1]. Diabetes is increasingly spreading around the world, and it is expected that the percentage of adults with diabetes between the ages of 20 and 79 years will increase from 10.5% in 2021 to 12.2% by 2045 [2]. The main symptoms that lead to diabetes and high blood glucose levels include increased thirst for polyuria and tired urination, tiredness of vision, unexpected weight loss, growing hunger, slow wound healing and frequent infection, redness, swelling of the gums, tingling or numbness in the hands or numbness early feet of these potential symptoms can lead to early diagnosis and appropriate treatment, which helps in preventing complications from diabetes, including diabetics and enhances a better healthy life [3].

The increasing population of obesity around the world inevitably contributes to increasing the spread of T2DM disease. It occurs when the body fails to produce enough insulin or cannot use insulin that it produces effectively [4]. The rapid increase in the prev-

alence of obesity is partly responsible for the equivalent rise in diabetes, affecting approximately 10.5% of the world's population, with the incidence of diabetes among young people also increasing significantly [5]. Obesity is a global health problem according to what the World Health Organization announced that obesity will become the epidemic of the twenty -first century, as women generally suffer from higher rates than men and usually occurs due to excessive eating, low physical activity and genetic preparation [6] can be defined obesity and excess weight by 30 and more according to the Body Mass Index (BMI) as a chronic and complex disease and has multiple causes that lead to an increase in the accumulation and gathering of fats in certain areas of the human body. Studies also indicate that obesity has a m in many serious diseases Including insuline resistance and Type 2 Diabetes Mellitus, Hyperterance, Cronary Arttery, Cerebral Stroke, Non-alcoholic Statohepationis Metabolic syndrome [7]. Obesity or excessive weight gain also indicates that it is the most important risk factor in the development of T2DM in all age groups, as it is stained into epidemiological dimensions, which makes the treatment of obesity it is extremely important in preventing the second type of diabetes and since obesity causes insulin resistance, it may need people with obesity to large amounts of insulin to maintain normal blood sugar levels [8].

The current study aims to estimate the concentrations of fatty fat levels, which includes the concentration of total cholesterol, triglycerides, and lipid protein, high -density, low -density fatty protein and very low -density lipoprotein in women with soft women and bodies with type 2 diabetes.

2. Materials and Methods

Study Design

90 samples were collected from women with diabetes with ages ranging from (20 years to 40 years) and these samples were collected from civil laboratories and government hospitals from October 2023 to March 2024 and divided into four groups as the first group: a group of healthy women, who number 15 second group: Women with diabetes, number 25, the third group: women with obesity, who are 25, the fourth group: women with diabetes and obesity, numbering 25.

Blood Samples

Blood samples collected blood samples from patients by (5) ml of vein placed in glass tubes containing gel and without anticoagulant Vacuum tube with gel and clot activator The sample was left at room temperature for 30 minutes for coagulation and then the tubes were placed in the centrifuge for (15) minutes and quickly (3000) rpm to obtain serum.

Physiological and Biochemical Tests

The concentrations of cholesterol, triglycerides and high-density lipoprotein were estimated using the special ready-made kit from the French-origin Biolabo-based manufacturer according to the method [9], and the levels of both low-density and very low-density cholesterol were calculated using the method described by [10]and this procedure is based on the following relationships:

$C_{VLDL} = TG/5$

$C_{LDL} = C_{SERUM} - (C_{HDL} - C_{VLDL})$

Statistical Analysis

The results obtained from the current study were analyzed using the statistical program SPSS based on the ANOVA test (a one-limit variance and the rate test) to compare

the studied totals and the significant differences between the arithmetic averages were tested using the Duncan multiple range test to compare four groups at a significant level ($P \leq 0.01$) and the values of the variables were described as the standard deviation ±± rate [11].

3. Results and Discussion

Table 1. Fat concentrations in the study groups

Measurements					Groups
VLDL	HDL	LDL	T.G	T. Cholesterol	
24.467 d ± 2.560	47.62 a ± 4.700	63.80 c ± 11.64	122.21 d ± 12.43	134.32 c ± 12.30	Control Group
42.04 a ± 3.446	31.72 b ± 3.623	134.522 b ± 20.59	210.61 a ± 17.34	208.23 b ± 20.08	Diabetes Group
36.080 c ± 2.397	30.84 b ± 4.836	160.045 a ± 22.90	180.40 c ± 11.98	227.14 a ± 22.70	Obesity Group
39.28 b ± 2.293	31.12 b ± 2.920	138.864 b ± 14.35	196.40 b ± 14.61	214.65 ab ± 27.30	Obesity Group
0.01	0.01	0.01	0.01	0.01	P-Value

Total Cholesterol Level

The results in the current study in Table (1) show a moral rise ($P \leq 0.01$) in the overall cholesterol concentration in the group of diabetes and obesity (214.65 ± 27.30) mg/100 ml and a group of diabetes only (208.23 ± 20.08) mg/100 ml and a group of obese people Only (227.14 ± 22.70) mg/100 ml compared to the control group (134.32± 12.30) mg/100 ml, and the results of the study showed that there are no moral differences in the overall cholesterol concentration between the group of diabetes and obesity when compared to the group of diabetes only and the group of obesity only. It was found a significant increase in the group of obese people compared to the group of diabetes only, and this result was compatible with what reached the [12], which indicated that there is a positive relationship between obesity and the levels of total cholesterol in patients with obesity and type 2 diabetes T2DM and instructed the cause to Increased TNF-α In patients with obesity, and this increase is directly related to the emergence of insulin resistance and then high blood sugar and the relationship of this height to the metabolism of fat.

The reason may be because obesity and metabolic syndrome leads to Non-ALCOHOLIC FTTY LIVER and the high levels of blood fat and then increase oxidative stress as a result of the accumulation of free radicals, and this in turn leads to a reduction in LPL activity and a defect in blood fat concentrations and TC's height at serum Blood, or may be due to the low ability to consume glucose produced when stimulating fat decomposition in the fatty tissue and free fatty acids, which increases the concentration of cholesterol blood serum [13]. Increased cholesterol in patients with diabetes may lead to an increase in the activity of Cholesterol Acyl Transferase and responsible for absorbing cholesterol in the intestine and this may stimulate the lack or absence of the hormone insulin and that the hormone deficiency may lead to excessive use of fats in oxidation, energy production and fatty metabolism. The cholesterol absorption rate by the liver and intestine and its

levels remain constant, and when these changes in the creation of cholesterol are not sufficient to compensate for the changes in the entry or exit of cholesterol from the body, the level of activity of the low -density sebaceous protein in the liver may increase or decrease, which leads to a lower or similar rise in cholesterol levels [14].

Triglycerides Level

The results in the current study in Table (1) indicate a moral rise (P≤ 0.01) in the concentration of triglycerides in the group of diabetes and obesity (196.40 ± 14.61) mg/100 ml and a group of diabetes only (210.61 ± 17.34) mg/100 ml and a group of obese people Only (180.40 ± 11.98) mg/100 ml compared to the control group (122.21 ± 12.43) mg/100 ml, and the results of the study recorded a moral rise in the concentration of triglycerides in the group of diabetes only when compared to the group of diabetes, obesity and obesity injuries only, the results are consistent with the current study with the findings of [13], which found high levels of triglycerides in diabetics and explained the reason that the loss or decrease in insulin as a result of the breakdown of the pancreas led to the inhibition of the work of the Lipoprotein Lipase that works to degrade triglycerides into fatty acids and cycler, as well as well Production of free fatty acids that help in the process of building triglycerides. Increased triglycerides are due to the low activity of the Lipoprotein Lipase enzyme, which plays a decisive role in regulating body fat balance. This enzyme mediates the decomposition of fat within the blood vessels of the fatty proteins rich in triglycerides, such as kilomeicons and very low-density fatty proteins (VLDL-C), by decomposing to fatty acids and glycerin. Poor activity of this enzyme leads to high levels of triglycerides in the blood, which increases the risk of cardiovascular disease [15, 16]. Studies have shown that eating foods rich in carbohydrates and fats can lead to hyperbia in the blood, including triglycerides (TG), as a result of the fat -lipox and inhibit the output of steroids and yellow salts, in addition to the occurrence of absorption disorders in the intestine due to the low expression of the CYP7A1 enzyme, which limits the rate of synthesis of bile acids involved in fat metabolism. The reason for increasing triglycerides can be the absence of insulin, which leads to the release of free fatty acids from the fatty tissue to be used as an energy source by turning them into ketogenic bodies, which can be used again in the formation of triglycerides [17].

High Density Lipoprotein Level

The results are shown in the current study in Table (1) the presence of a moral rise (P ≤ 0.01) in the concentration of low -density lipoprotein LDL in the group of diabetes and obesity (138.86 ± 14.35) mg/100 ml and a group of diabetes only (134.52 ± 20.59) mg/100 ml and a group obesity are only (160.04 ± 22.90) mg/100 ml compared to the control group (11.64 ± 63.80) mg/100 ml, and the results of the study recorded the highest value in the group of obesity when compared to the group of diabetes and obesity and the group of diabetes only, The results showed that there are no moral differences between the group of diabetes and obesity and the group of diabetes only. The results of the current study are consistent with the results of the [18]. Who indicated the high blood fat in people with obesity, especially the LDL that transports cholesterol to cells and the arteries of the body, after which the yellow plates are formed, and more than 63% of these people develop vascular heart diseases, and the high blood fees, including LDL, is due to the excessive liver in the production of APO B for an inevitable result of infections that occur to excessive body fat. Among the reasons that lead to this decrease are the changes in liver function, which causes a decrease in the production of sebaceous protein (APO-A) APOLIPOPROTEIN is one of the main proteins responsible for the composition of high-density fatty proteins of HDL-C, and this results in a decrease in protein concentrations high-density sebaceous cholesterol, which is important in cholesterol transmission operations from different

body cells to the liver, which can be a decrease in its concentration in the cause of atherosclerosis [19].

HDL- C To increase the concentrations of cholesterol, triglycerides, and low-density fatty protein (LDL-C). HDL-C in this process. Due to the interactive types of oxygen, it leads to a decrease in HDL-C levels, which is the main conveyor of cholesterol from the cells of the body to the liver. This HDL-C deficiency is considered one of the distinctive signs of atherosclerosis and blood ingredient disorder, and it reflects an unhealthy lifestyle, poor metabolism, and increases the risk of cardiovascular disease [20]. Diabetes leads to a reduction in HDL due to the increased effectiveness of the cholesterol-c cholesterol ESTER TRASE, which transfers the cholesterol from the HDL-C to the Vldl-C, leaving HDL rich in triple and less composed towards APO-A, as well as the hepatic Lipase Lipase It is active in a lower HDL in the blood serum or the reason may be due to the low effectiveness of the Lipo Protein Lipase (while the effective effectiveness of the Hepatic Lipase that contributes to lowering HDL [21].

Low -Density Lipoprotein Level

Results in the current study in Table (1) show a moral decrease ($P \leq 0.01$) in the concentration of the HDL sebaceous protein in the group of diabetes and obesity (31.12 ±2.92) mg/100 ml and a group of diabetes only (31.72±3.62) mg/100 ml and a group Obesity are only (30.84 ±4.83) mg/100 ml compared to the control group (47.62 ± 4.70) mg/100 ml, and the results of the study recorded a moral rise in HDL in the control group compared to satisfactory groups, and the absence of moral differences between the group of diabetes, obesity and a group Diabetes only and a group of obesity only The results of the current study are consistent with the findings of the [21] they found a decrease in the HDL level in patients with obesity as a result of the effect on the health of the liver and the fat of fats in it, as the level of cholesterol, triglycerides and LDL-C increases for the reasons that were previously mentioned and thus lead to transportation The opposite of these fats to the HDL consumption that it transports in addition to the LDL oxidation and the demolition of internal cholesterol due.

Another reason is to increase oxidative stress as a result of the high concentrations of the free radicals generated, which leads to a reduction in LPL activity, and this in turn leads to raising bad blood fat, including LDL. (VLDL) to LDL-C due to the failure of the triple cyclides to decrease the LPL effectiveness, as well as raising the level of oxidative stress leads to an imbalance in the liver receptors of LDL cholesterol or can explain the increase in LDL-C to oxidation of high-density protein receptors in the blood serum, may be explained by The infections associated with obesity increase the concentration of free radicals in the body, which cause beta cell damage, insulin shortage, and disintegration of fat cells, editing that free fatty acid. The lack of the hormone insulin and the disintegration of fat cells release the free fatty acids that the liver tolerates in abundance to form VLDL, thus increasing its concentration and then turning into LDL with a defect in its receptors [22].

Very Low Density Lipoprotein Level

The results in the current study in Table (1) show the presence of a moral height ($P \leq 0.01$) in the concentration of the very low -density sebaceous protein VLDL in the group of diabetes and obesity (39.28 ±2.29) mg/100 ml and a group of diabetes only (42.04±3.44) mg/100 ml and the group of obese people only (36.08 ±2.39) mg/100 ml compared to the control group (24.46 ±2.56) mg/100 ml, and the results of the study recorded the presence of moral differences between pathological groups, as the highest value for VLDL was recorded in the group of diabetes only then the group of obese and diabetes and Obesity group, the results of the current study are consistent with the findings of both [23]. The

reasons that contribute to increasing the concentration of VLDL-C in the blood serum include metabolic processes that are not under control and regulation. The mechanism in which fat is distributed in the blood serum of people with type 2 diabetes.

One of the reasons that lead to the high levels of VLDL-C is a triglycerides rich in VLDL-C by the lipoprotin (LPL), which is located in the lining of the blood vessels of the fatty tissues and in the muscles. Store or use to obtain energy, the physical tissue absorbs these fatty acids, and the increase can occur as a result of high blood glucose concentration, which leads to non-control of metabolism and low VLDL-C decomposition. This leads to a decrease in the concentration of high-density sebaceous proteins for cholesterol (HDL-C). A decrease in the effectiveness of the LPL enzyme due to the lack of concentration of the hormone insulin, which leads to a decrease in the process of removing tri-cyclides and fatty proteins and very intensely density of cholesterol [24]. Also, diabetes leads to a decrease in the ability to consume glucose, while the lipolysis of the fat tissue increases, and the free fatty acids, which are used by the liver in the production of VLDL, increase, leading to its rise [25, 26].

4. Conclusion

We conclude from the current study to increase the concentration of total cholesterol, triglycerides, low -density lipoprotein, low -density lipoprotein, and a decrease in lipoprotein, very intense, in healthy women and bodies with type 2 sugar. It may be the result of the body's response to cases of chronic past tension and changes in energy requirements, and this may be caused by many factors, including chronic inflammation, as inflammation can affect the metaphor of cells, and the metabolism balance disorder for high blood and insulin levels can lead to changes in activity and metabolic signs paths.

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