Association Between Leptin and Lipid Profile in Patients with Type 2 Diabetes mellitus

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العلاقة بين هرمون اللبتين والدهون في المرضى الذين يعانون من السكر من نوع الثاني

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Abstract

Diabetes Mellitus(DM) is worldwide disease, the levels of lipids are too affected in a patient with diabetes mellitus due to a variety of factors, one of them carb- ohydrate metabolism. This investigation evaluated liptin as indicator to the levels of the lipids in people with DM. The study included a total of 90 patients divided into30 healthy controls (Group 1), 30 DM type 2 patients (Group2) as well as 30 DM with atherosclerosis (Group 3). The high value where observed by ELISA and spectrophotometer in DM patients (Group 2) compared to the controls (Group 1) (54.68±9.67 vs. 42.18±4.38), furthermore, group 2 value is also greater than the value in (Group 3) (54.68±9.67 vs.25.69±2.61). However additional research involving more patients is necessary to establish which marker's precise functionally as an indicator.

Keywords: Liptin, Cholesterol and Diabetes Mellitus.

المستخلص

اجريت هذه الدراسة على تسعين فردا منهم ثلاثون مريضا بداء السكري من نوع الثاني و ثلاثون مريضا مصابون بداء السكري من النوع الثاني مع تصلب الشرايين وثلاثون فردا عوملوا كمجموعه للسيطرة. حصل على عينات الدم من المرضى لقياس تاثير داء السكري من نوع الثاني وايضا تاثير هرمون النحافة والكولسترول الكلي والبروتينات الدهنية عالية الكثافة والكليسيريدات الثلاثية والبروتينات واطئه الكثافة جدا والبروتينات الدهنيه. اظهرت نتائج هذة الدراسة حدوث زيادة ملحوظه في علي تركيز هرمون النحافة الكولسيتيرول و الدهون الثلاثية والبروتينات واطئه الكثافة و حدوث نقصان في البروتينات عالية الكثافة عند مرضى مقارنة بمجموعة السيطرة، كما و لوحظ زيادة في تركيز هرمون النحافة في HBTVH النساء الافراد المصابين بداء السكر والذين يعانون من البدانة والزيادة ملحوظة في هرمون النحافة تتزامن مع الزيادة في موشر كتلة الجسم.

الكلمات المفتاحية: لبتين، كولوسترول، داء السكري النوع الثاني

Introduction

Chronic diabetes mellitus is a disease that occurs when the pancreas malfunctions the body produces enough insulin or The body produces insulin inefficiently (Bora and Barman, 2021). In accordance with prior medical records is yet no diabetic cure although it is possible to balance the impacts with proper health management and consistent medical check-ups (Rout and Kaur,2019). greater thirst and greater frequency of urination hunger are all indicators of increased diabetes if untreated blood sugar can have a number of negative effects Chronic renal failure cardiovascular disease and stroke foot ulcers, poor vision, and all significant long-term issues (Preethikaa and Brundha, 2018). The conditions of ketoacidosis and hyperosmolar hyperglycemia the worst clinical consequences that can result in a lack of fluids being unconscious and Death in the absence of sufficient therapy (Rahman and Babar,2022). Liptin Adipose tissue is thought to be as a primary repository for fat plays a passive part in the metabolism of energy The adipose system is universally acknowledged the biggest endocrine organ ever tissue (Auger and Jeschke, 2020). It releases lots of hormone Adipokines that regulate nutrition, immunity, and reproduction neuroendocrine function and hormones Adipocyte tissue has been identified since the finding of the liptin gene and obesity (Kaplan, 2018). Is a signal of fullness sent by the brain via that adipose cell insulin and glucose metabolism control mechanism and contributes to the balance of energy by using a neuroendocrine mechanism and body weight (Nunziata, *et al*., 2019 (. Leptin decline mediates weight loss gain through the hypothalamus to boost hunger reduce energy consumption altering neuroendocrine processes (Yau, *et al*., 2020). The total plasma lipid ranges from 400 to 600 mg/dl Cholesterol makes up one

third Triacylglycerol makes up one third in addition to others phospholipids are lipids being insoluble in water they aid in they are transported in plasma complexes to create lipoprotein from protein The lipoprotein's component protein is identified as APO lipoprotein (Ledesma, *et al*., 2022). Among them are chylomicrons. Extremely Low Density Lipoprotein (VLDL) (LDL) or low density lipoprotein (IDL) or intermediate-density lipoprotein (HDL) or high density lipoprotein Protein and fat content varies components, dimensions, density, and place of origin Work to maintain both of their components being lipid soluble they move in the Plasma will offer an effective method for transferring the tissue's lipid content (Hedegaard, *et al*.,2010).

Materials and Methods

Patients and Control

The equation for Daniels sample size formula was used to calculate sample size includes three sets of individuals, the first group consists of the 30 patients as T2DM diagnosed, the specified category consists of (30) seemingly healthy controls and 30 patients represent the third group that was diagnosed with T2DM and atherosclerosis.

Exclusion Criteria

1- Patient with heart diseases and hypertension
2- Pregnant women.
3- Smokers.
4- Type 1 diabetes patient

5- chronic liver disease

6- Thyroid disease

Determination of serum liptin

ELISA kits for diagnostic were employed to calculate the liptin levels in the patients and control groups.

Determination of serum lipid profile

Lipid concentration was measured using spectrophotometer method.

Results

Categories based on age and related groups research reveals a substantial rise patients and DM patients' ages more than with DM and atherosclerosis. There is a control person significant age reduction in DM fewer patients than those who have DM. with atherosclerosis, as shown in Table (1).

Table (1): Age of diabetic and control groups

Parameter		Subjects	No.	Mean ± SD	p-value
Age year	patients	DM	30	59.06±10.04	≤0.05
		DM with atherosclerosis	30	63.76±8.69	
	control	Male	15	26.2±7.1	
		Female	15	26.1±7.2	

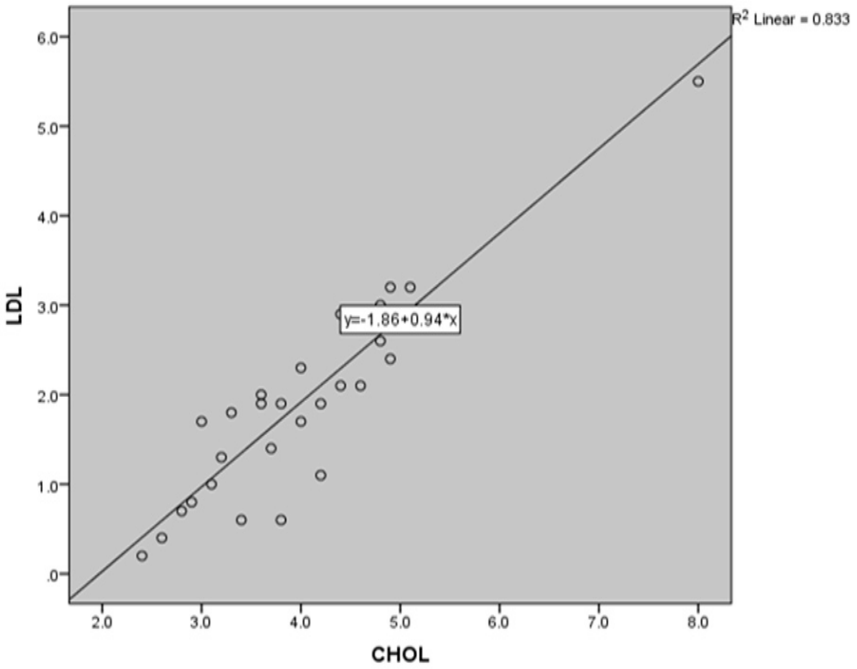

Figure (1): Shows significant positive correlation between LDL and cholesterol in diabetic patients with Atherosclerosis. Furthermore, this investigation demonstrates that cholesterol and LDL showed statistically significant positive association too (P-value ≤0.05, significant).

Discussion

The findings of the present study showed a significant link (Table 1) between age-related changes and prevalence T2DM or type 2 diabetes is similar to Atherosclerosis T2DM, which is a metabolic condition of disorder frequently connected to fat poor eating patterns and a sedentary lifestyle the possibility of

producing T2DM grows as you get older. On the other hand the Atherosclerosis is marked by the plaque accumulation in the arteries which may cause serious cardiovascular issues including heart attacks and strokes.

Atherosclerosis development risk is also increases with age (Cardiol, 2022). These Atherogenic factors are a significant part of Apolipoprotein B (Apo B) is a lipoprotein that supports the buildup of LDL in the blood Atherosclerosis is started by the intima and is mediated by increased permeability of the endothelium and elevated intimal retention of LDL (Turner. *et al*., 2020).

There is evidence that diabetes patients Leptin and HDL have a relationship levels In particular research have revealed that Leptin levels that are greater could connected to reduced HDL values cholesterol in people with diabetes one potential The reason behind this link is that Leptin could help with the growth a condition called insulin resistance that can a dyslipidemia (irregular lipid levels) low HDL cholesterol levels Additionally oxidative stress and inflammation are connected to diabetes as well as contributing to lower HDL levels (Vergès, 2015).

Conclusions

1- Leptin hormone has a predictive capacity to predict T2DM as they significantly associated with IR and fraction lipid profile.

2- The study showed wide spread abnormalities lipid in the course of D.M. triggered dyslipidemia as hypercholesterolemia hypertriglyceridemia higher LDL and decreased HDL.

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