Ministry of Higher Education and Scientific Research

**University of Babylon
the college Science for girls**

Estimation of lipid profile in patients with diabetic mellitus

Research submitted by the student

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Dedication

And to every ambitious student who comes after us to complete the path of science, success and development

To every tear a mother cried with longing and joy at our success

To the bowing of our fathers who made us so straight

Dr. Talaat Tarek Khalil

Abstract:

The study was designed to evaluate the medical relevance of total Cholestrol levels (TCH), TG levels, HDL levels VLDL levels, LDL in Diabetic disease. Blood samples were taken from departments of a ministry of healthy hospitals. twenty five patient (study group) and twenty five healthy controls (group control). We found that significantly increased Cholestrol levels, LDL levels, TG levels were demonstrated in Diabetic disease ($p < 0.01$). The mean HDL levels in patient with Diabetic disease was significantly lower than the control group ($p < 0.02$). Moreover, abnormal lipid profile is considered as indicator for insulin resistance (IR) and B-cell dysfunction.

Introduction

Diabetes mellitus (DM) is the most common endocrine disorder in man, currently affecting over 170 million people world-wide (Saini, 2010). The term "diabetes" was first used in 230 BCE by the Greek Appollonius of Memphis. Later, the word mellitus (honey sweet) was added by Thomas Willis in 1675 after rediscovering the sweetness of urine and blood of patients (Ripoll and Leutholtz, 2011).

Diabetes mellitus is characterised by absolute or relative deficiencies in insulin secretion and/or insulin action associated with chronic hyperglycemia and disturbances of carbohydrate, lipid, and protein metabolism (Mosaad and Abd Allah 2004). Defects in carbohydrate metabolizing machinery and consistent efforts of the physiological system to correct the imbalance in carbohydrate metabolism place an overexertion on the endocrine system (Effiong et al., 2013).

There are two main types of diabetes, type I insulin dependent diabetes mellitus (IDDM), which is usually manifested in childhood or adolescence, and characterized by pancreatic B-cell destruction mediated by immune mechanisms, severe insulinopenia and dependence on exogenous insulin to preserve life (Saleh, 2011). Whereas type II non- insulin dependent diabetes mellitus (NIDDM), is caused by insulin resistance in the liver and skeletal muscle, increased glucose production in the liver, over production of free fatty acids by fat cells and relative insulin deficiency (Rosenbloom et al. 1999). The aim of the study:

.To determine the level of sugar in the blood

Pathogenesis

Many acquired factors play a role in the pathogenesis of the diabetic disease. Factors that contribute to insulin resistance include obesity, genetic factor, aging, and a sedentary lifestyle. Other acquired factors that may contribute to the insulin secretory defect include chronic glucotoxicity and elevated free fatty acid levels (Eriksson et al., 1989).

Symptoms

Symptoms of marked hyperglycemia include polyuria, polydipsia, weight loss, sometimes with polyphagia, and blurred vision. Impairment of growth and susceptibility to certain infections may also accompany chronic hyperglycemia (Shoback, 2011).

Cholesterol is a waxy fat-like substance that your liver makes. It helps build protective layers, called membranes, around the cells in your body. It also contributes to the production of certain hormones as well as vitamin D and bile, which helps you digest food. In other words, despite its bad rap, cholesterol plays an important role in your body.

Your body makes all the cholesterol that you require. However, your diet can contribute cholesterol as well, causing your level to rise. Foods that are high in saturated fat, like red meat, are mainly responsible for high cholesterol. When your cholesterol rises, so does your risk of heart disease. That's why it's important to lower your cholesterol if it has become elevated.

Experts divide cholesterol into two types. They are: 1_Lowdensity lipoprotein (LDL) cholesterol 2-High-density lipoprotein (HDL)cholesterol . Low-density lipoprotein: Often referred to as bad cholesterol, LDL cholesterol contributes to the buildup of plaque in your arteries, a process called atherosclerosis. Plaque, made from cholesterol and other substances, can prevent blood from

flowing normally in your blood vessels. Blockages caused by plaque can trigger a heart attack or stroke. For that reason, you want low levels of this type of cholesterol relative to the total amount of cholesterol in your blood.

How does sugar affect cholesterol levels?

Sugar is a kind of carbohydrate. There are different types of sugar that occur naturally and others that people chemically refine.

According to a 2016 medical review as sugar intake increases, LDL cholesterol levels go up, whereas HDL cholesterol levels go down. This is especially true of some sugars, such as refined fructose or sucrose, as opposed to other sugars, such as glucose.

However, a 2022 review of scientific research found that consuming low levels of added dietary sugar has minimal effects on long-term LDL and HDL cholesterol levels. However, the researchers noted that further studies into this topic are necessary.

People who are concerned about their cholesterol levels may not need to cut added sugars out of their diet completely. However, reducing their added sugar intake may be beneficial.

The link between sugar and cholesterol

As we've already discussed, the substance of cholesterol itself isn't inherently a bad thing, but an excess of LDL (the bad type) is. In a nutshell, research shows that when

you consume too much sugar, your body starts to make more and more excess LDL cholesterol, subsequently lowering the amount of HDL cholesterol in your body (the good type).

This itself causes an imbalance in the good/bad cholesterol and a general increase in the total cholesterol levels. Here's the scientific evidence to back it up.

Doctors can measure a person's cholesterol levels using a blood test .

According to the AHA, anyone over the age of 20 years should get a cholesterol test every 4-6 years. People at higher risk, such as those who have had a heart attack, should get checked more frequently.

The National Library of Medicine (NLM) suggest the following cholesterol levels are healthy for adults:

1- Total cholesterol: 125-200 milligrams per deciliter (mg/dl)

2- Non-HDL cholesterol: less than 130 mg/dl

3- LDL cholesterol: less than 100 mg/dl

4- Total HDL cholesterol: The healthy level varies by sex: for biological males, it is 40 mg/dl or higher, and for biological females, it is 50 mg/dl or higher.
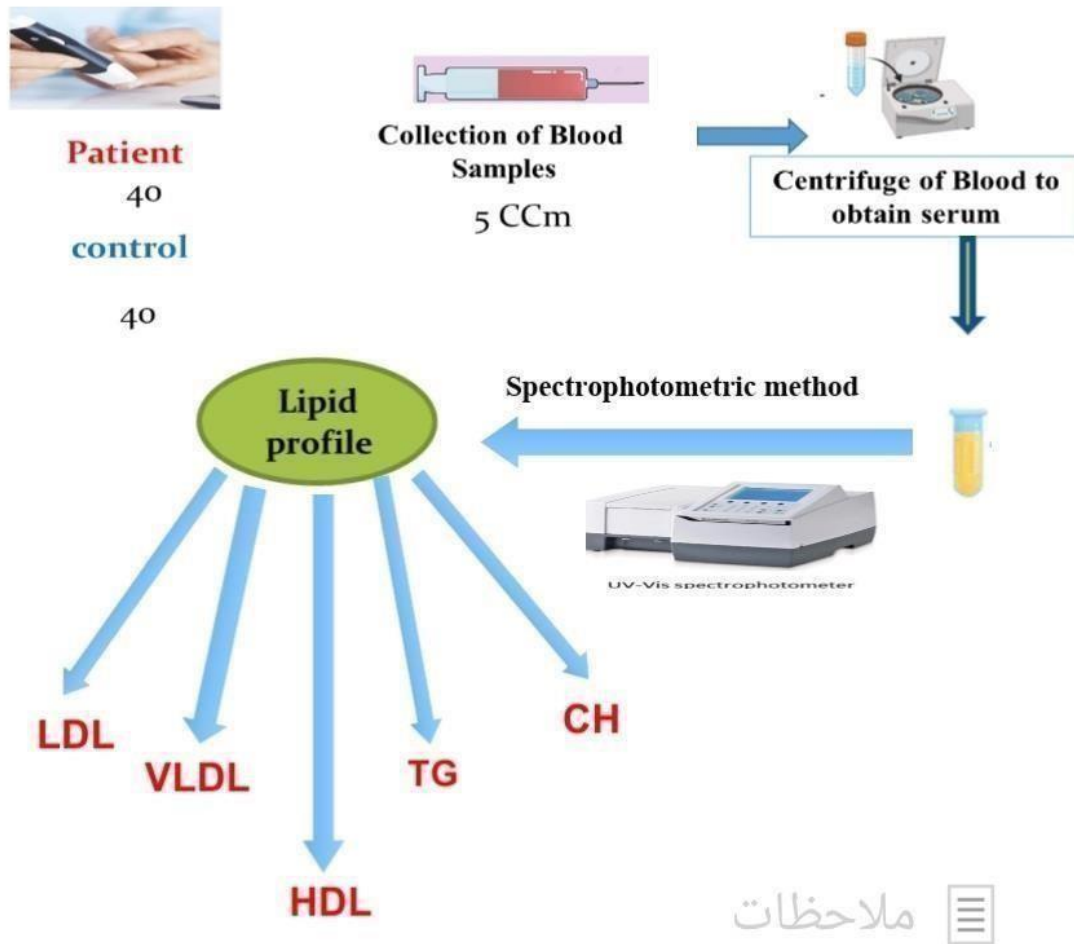
Cholesterol and triglycerides are both lipids, but have very different shapes.
Cholesterol is made up of connected rings of carbon atoms and also is called a "sterol". Triglycerides are chains of carbons called "fatty acids", attached at one end to a carbon backbone. We all know that oil doesn't mix with water! Our blood lipids are just like oil. In order to circulate in the watery blood, these lipids (cholesterol and triglycerides) are packaged along with proteins. These packages are called lipoproteins.

LDL: These particles are like a gateway that transports cholesterol to the parts of the body that need it at any time. Unfortunately, if the percentage of these particles increases in the blood, they deposit cholesterol on the walls of blood vessels, which may cause blockage of these vessels and thus lead to heart attacks. This is why people describe LDL particles as the "bad" cholesterol. Fortunately, the amount of LDL in the blood correlates with the amount of saturated fat and cholesterol you eat, so many people can reduce LDL if they follow a low-fat diet. And when you do a test to find out your cholesterol while you are fasting, the doctor in this case checks your LDL cholesterol.

How can LDL cholesterol affect diabetes?

.**Low-density lipoprotein: Often referred to as bad cholesterol, LDL cholesterol contributes to the buildup of plaque in your arteries, a process called atherosclerosis. Plaque, made from cholesterol and other substances, can prevent blood from flowing normally in your blood vessels. Blockages caused by plaque can trigger a heart attack or stroke. For that reason, you want low levels of this type of cholesterol relative to the total amount of cholesterol in your blood**.

The method of work:

Conclusion

Plenty of scientific research suggests that a high-sugar diet can play a significant role in high cholesterol levels - specifically a fall in the 'good' HDL cholesterol levels and a rise in 'bad' LDL cholesterol and triglycerides levels. Such high cholesterol levels lead to an increased risk of all sorts of health conditions including heart disease, diabetes, stroke and liver failure .

However, cholesterol levels are reversible and controllable - especially if a high-sugar diet of refined processed foods is the main cause. Rest assured, you can bring down your cholesterol with a number of small but worthwhile changes in your diet.

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