Overview of HDL, LDL, Triglycerides, and Total Cholesterol in Obese Patients

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ABSTRACT

Obesity occurs because of the accumulation of fat in the body and can occur due to high cholesterol so that it can interfere with health. This study aims to provide an overview of HDL, LDL, triglycerides, and total cholesterol in obese patients. This method is by calculating the Body Mass Index (BMI) and cholesterol examination which includes examinations of HDL, LDL, Trigylserides and Total Cholesterol. The data obtained were then analyzed descriptively. Based on this research, it was found that based on the cholesterol levels of obese patients were still within normal limits, namely the HDL levels with medium criteria as much as 74.16%; LDL levels with normal criteria were 51.69%; Triglyceride levels with normal criteria were 78.65%; and total cholesterol levels with normal criteria as much as 51.69%.

Keywords: Obesity, Cholesterol, HDL, LDL, Triglycerides.

1. INTRODUCTION

Obesity can occur because the energy intake that enters the body is greater than the energy expended. So that excess energy will be stored as fat in the cells, and can cause weight gain. Obesity is considered as one of the factors that can increase the prevalence of hypertension, glucose intolerance, and atherosclerotic coronary heart disease in obese patients [1]. Obesity can occur because of high cholesterol which is considered bad for health. The types of cholesterol in our body are LDL (Low Density Lipoprotein) which can stick to blood vessels and HDL (High Density Lipoprotein) which is fat that can dissolve LDL content in the body. While the total amount of cholesterol in the body is called total cholesterol. Obesity has a close relationship with the high incidence of cardiovascular disease [2]. Body metabolism and heart performance will be disrupted when LDL levels in the body's blood are more than HDL levels. HDL referred to as the good fat, because it cleans LDL-cholesterol from the walls of blood vessels by transporting it back to the liver.

There is a relationship between obesity and coronary heart disease, the formation of atherosclerosis is related to the lipid profile in the blood [3]. The lipid profile is a state of blood fat in terms of the content of Total Cholesterol, Low Density Lipoprotein (LDL), High Density Lipoprotein (HDL) and Triglycerides [4].

2. RESEARCH METHODS

This study aims to provide an overview of HDL, LDL, triglycerides, and total cholesterol in obese patients. The sample of this study was 89 respondents consisting of men and women aged 25 to 55 years who have obesity with BMI 25 Kg/m². The procedures of this research include: (1) Body Mass Index (BMI) calculation by measuring height, weighing body weight, then calculating the BMI formula; and (2) Cholesterol examination using enzymatic reaction method to measure the levels of HDL, LDL, Triglycerides and Total Cholesterol. The data obtained were then analyzed descriptively.

3. RESULTS

The distribution of lipid profiles in obese patients is as listed on the table below.

Table 1. Frequency Distribution of Obese Patients by Age

Age	Amount	Percentage
25-35	31	34,83 %
36-45	39	43,82 %
46-55	19	21,35 %
Total	89	100 %

Table 2. Frequency Distribution of Obese Patients by Gender

Gender	Amount	Percentage
Male	57	64,04 %
Female	32	35,96 %
Total	89	100 %

Table 3. Frequency Distribution of Obese Patients Based on HDL

HDL Criteria (mg/dL)	Amount	Percentage
Normal (<40)	20	22,47 %
Medium (40-60)	66	74,16 %
High(>60)	3	3,37 %
Total	89	100 %

Table 4. Frequency Distribution of Obese Patients Based on LDL

LDL Criteria (mg/dL)	Amount	Percentage
Normal (<130)	46	51,69 %
Medium (130-159)	26	29,21 %
High ($\geq$160)	17	19,10 %
Total	89	100 %

Tabel 5. Frequency Distribution of Obese Patients Based on Triglycerides

Trigliserida Criteria (mg/dL)	Amount	Percentage
Normal (<150)	70	78,65 %
Limit High (150-199)	14	15,73 %
High(200-499)	5	5,62 %
Very High($\geq$500)	0	0 %
Total	89	100 %

Table 6. Frequency Distribution of Obese Patients Based on Triglycerides

Total Cholesterol Criteria (mg/dL)	Amount	Percentage
Normal (<200)	46	51,69 %
Medium (200-239)	29	32,58 %
High($\geq$240)	14	15,73 %
Total	89	100 %

4. DISCUSSION

This study was conducted on 89 samples of obese patients consisting of male and female with an age range between 25-55 years. From the results of the study, it was found that the most obese patients in the range of 36-45 years with percentage 43.82% and the majority of patients were male with a percentage of 64.04%.

On examination of HDL levels, it was found that most obese patients were known to have moderate HDL levels (40-60 mg/dL) with a percentage of 74.16%. Meanwhile, the highest LDL level was in the Normal criteria (<130 mg/dL) with a percentage of 51.69%. Triglyceride examination in obese patients showed that the majority still had normal levels (<150 mg/dL) with a percentage of 78.65%. Total cholesterol examination also showed that more than half of obese patients studied still had normal levels (<200 mg/dL) with a percentage of 51.69%.

Cholesterol is produced from the liver as much as 80% and 20% can come from food. HDL takes cholesterol and phospholipids in the blood and submits them to other lipoproteins to be transported back or removed from the body [5]. HDL carries excess cholesterol from cells and tissues to the liver to produce bile or recycle it [6]. Liver cells produce cholesterol in the body, which is spread by LDL cholesterol in the blood to body tissues. Cholesterol is carried to the body's cells in need such as heart muscle cells, brain, and other body parts for the body to function properly. High and concentrated levels of LDL cholesterol in the blood will cause more cholesterol to stick to the walls of blood vessels when transportation is carried out. Cholesterol that is attached slowly will easily pile up and then settle, forming plaques on the walls of blood vessels. Pile of LDL cholesterol that settles on the walls of blood vessels can cause cavities of blood vessels to narrow, so that blood vessels are disrupted and can lead to the risk of a person's body diseases such as stroke, coronary heart disease, and so on [7].

Triglycerides are formed from fat and glycerol derived from foods by insulin stimulation or excessive calories due to excessive food consumption. The excess calories are then converted into triglycerides and stored as fat under the skin [8]. Triglycerides play a role in compiling lipoprotein molecules and function as a means of energy transportation and energy storage. Triglycerides can produce fatty acids that can be used as a source of energy needed by the body's muscles for activities or as energy stores in the form of fat or adipose tissue [9]. High triglyceride levels will be harmful to the body. Triglyceride levels cannot be more than 150 mg/dl. If triglyceride levels exceed normal limits, it will be dangerous for the body because some high lipoproteins also contain cholesterol so that it can cause hypercholesterolemia.

5. CONCLUSIONS

Based on this research, it was found that the lipid profile description of 89 samples showed that

most of the obese patients had medium HDL criteria of 74.16%; LDL with normal criteria 51.69%; normal criteria triglycerides 78.65%; total cholesterol with normal criteria 51.69%.

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