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Comparison of Perilipin Protein Levels in Obese with Metabolic Syndrome and Obesity Non Metabolic Syndrome

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Abstract : Perilipin is a highly phosphorylated adipocyte protein that is localized on the surface of the lipid droplet, that has a role in controlling access to the lipid lipolytic enzymes and played a role in setting the stroge and mobilization of trigliseride in the adipocytes. Because of the potential importance of adipocyte lipolysis to obesity and increasing perilipin protein in obesity this study aimed to analyze the comparison of protein perilipin levels in obese with metabolic syndrome and obese non metabolic syndrome. The sample population is obese adults, then we examined the weight, height, waist size, blood pressure, laboratory tests such as blood sugar levels and lipid profile of sample population to separate obese with metabolic syndrome and obese non metabolic syndrome. After we determined each group we measured perilipin protein levels in blood in obese with metabolic syndrome and obese non metabolic syndrome by Enzyme Link Immunosorbent Assay (ELISA) method. With statistical analysis using T test found that there was significant difference of perilipin protein levels between obese with metabolic syndrome and obese without metabolic syndrome ($p<0.005$). Perilipin protein levels was higher in obese with metabolic syndrome than obese non metabolic syndrome.
Keywords :Obesity, metabolic syndrome, perilipin, trigliseride.

Introduction

The incidence of obesity increase rapidly as a result of inactive lifestyle. The energy thst used for daily activity decrease parallels along with advances in technology. Based on WHO data there are 1.6 billion adults with overweight and 400 nmillion among them are obese[1]. Based on research data Riset Kesehatan Dasar in 2007[2], obesity prevalence in Indonesia generally in the population aged ≥ 15 years old is 10.3% (men 13.9% and women 23.8%)[3]. An individual determined as obese based on Body Mass Index (BMI) it is a simple index of weight–height relationship calculated as weight in (kg) divided by height in (m) squared. One is categorized as obese I when the BMI 25-29,9 and obese II when the BMI BMI >30 (4). Metabolic syndrome is a condition that characterized by visceral obesity, increasing trygliceride levels and glucose and decreasing *High Density Lipoprotein* (HDL) and hypertension that can cause a greater risk incidence of type 2 DM and cardiovascular deseases.[4,5] Prevalences of metabolic syndrome varies greatly it is caused by uniformity criterias that used to determine, ethnic difference, sex and age. It can be confirmed that metabolic syndrome likely to increase parallels with obesity or central obesity prevalences.[6,7,8]

Obesity is caused of accumulation of fat in adipose tissue. The adipocyte holds the major source stored energy in the body in the form of triacylgliserol (TAG)., it is covered by lipid droplet[9,10,11].The perilipins are highly phosphorylated adipocyte proteins that are localized at the surface of the lipid droplet.[9,10,11] With activation by protein kinase A, perilipins translocate away from the lipid droplet and allow hormone-sensitive lipase to hydrolyze the adipocyte triglycerides to release nonesterified fatty acids (NEFA) and glycerol from fat tissue can be regulated by a cAMP-mediated process.[12] The perilipin proteins are polyphosphorylated by protein kinase A and phosphorylation is necessary for translocation of HSL to the lipid droplet and enhanced lipolysis[13]. Overexpression of perilipin inhibited adipocytes lypolisis [15,16]. This study aimed to analyze the comparison of protein perilipin levels in obese with metabolic syndrome and obese non metabolic syndrome, in other study about perilipin protein was evidenced that was elevated at obesity.[17,18]

1. Method

This study involved 40 obesity subjects, all of whom were in good health. All subjects gave informed consent. Subjects divide two groups, one group is obesity with metabolic syndrome and other group is obesity without metabolic syndrome. Each group consisted of 20 subjects. To determine whether the subject of the metabolic syndrome so examination of weight, height, waist size, blood pressure, laboratory tests such as blood sugar levels and lipid profile. Sample So, two these groups examined the levels of protein perilipin by ELISA method

Table 1.Baseline characteristic of the 40 samples

	Obesitas with metabolic syndrome	**Obesitas non metabolic syndrome**
Age	43.9±11.3	34.55±10.8
BMI	33.86±5.0	31.75±4.0
Waist size	107±10	104±15
FBG	101.85± 50.8	88.49±7.2
HDL	63.2±23.85	46.05 ±6.99
Trig	193.15±88.59	91.9±32.81
Sistole	139.85 ± 16.3	123 ± 155
Diastole	87± 8.4	81.3 ±9.1
Perilipin	35.07±29.84	29.35±20.95

Stastical Analysisis

The data were statically analyzed, using the statistical analysis with T test, with T Test we found $p<0.005$, it means that there was significant difference of perilipin protein levels between obese with metabolic syndrome and obese without metabolic syndrome.

Table 2 One-Sample Test

	Test Value = 0					
	T	**Df**	**Sig.(2-tailed)**	**Mean Difference**	**95% Confidence Interval of the Difference**	
					Lower	**Upper**
Perilipin SM	5.255	19	.000	35.06685	21.1013	49.0324
Perilipin Non SM	6.264	19	.000	29.34848	19.5417	39.1552

P<0.005

Results and Discussions

The characteristics of the subjects of this study are shown in Table 1.Subjects in this study were not 20 years old . Body Mass Index (BMI) in the sample used in both obesity with metabolic syndrome and

obesity non metabolic syndrome is >27, in this study the waist size of the samples at the obesity with metabolic syndrome found from 89- 119 cm and waist size of the obesity non metabolic syndrome found 97- 117cm, Fasting Blood Glucose (FBG) in the obesity non metabolic syndrome samples were normal but the obesity with metabolic syndrome range from low to the moderately elevated range**.** Profile lipid like HDL value of the samples of obesity with metabolic syndrome range 34-60 mg/dL and HDL value of the samples of obesity non metabolic syndrome range 46-162 mg/dL. Triglyceride value of the samples of obesity with metabolic syndrome range 91-452 mg/dL and obesity non metabolic syndrome was 46-162mg/dL . Dividing sample group in to obesity with metabolic syndrome and obesity non metabolic syndrome base on 3 criteria from 5 criteria, that are LP >102 cm at male and >88 at female, triglyceride levels≥ 150mg/dL, HDL <40mg/dL at male and <50 mg/dL at female, Blood Pressure (BP) ≥130/85 Hg, so can be categorized as obesity with metabolic syndrome or obesity non metabolic syndrome. Perilipin protein in serum was measured by ELISA method. Allow samples to clot for 2 hours at room temperature or overnight at 4^{o} C before centrifugation for 20 minutes at approximately 1000xg. Collect the supernatant and carry out the assay immediately. Microplate reader with wavelength 450nm. The result of measuring perilipin protein was found the lower value at obesity with metabolic syndrome was 5.52 ng/ml and the highest value at obesity with metabolic syndrome was 150.24 ng/ml and the value at obesity non metabolic syndrome was 4.76 ng/ml and the highest was 85.77 ng/ml. This study aimed to analyze the comparison of protein perilipin levels in obese with metabolic syndrome and obese non metabolic syndrome, so we used the statistical analysis with T test found that there was significant difference of perilipin protein levels between obese with metabolic syndrome and obese without metabolic syndrome ($p<0.005$) . This study protein perilipin value was highest at obesity with metabolic syndrome than obesity no metabolic syndrome . Normal value perilipin protein range 0.156-10 ng/ml. This study protein perilipin value was highest at obesity with metabolic syndrome than obesity no metabolic syndrome. Normal value perilipin protein range 0.156-10 ng/ml. The study was done by Philip and friends found increasing perilipin protein at obesity and increasing perilipin, so decrease lypolisis[18]. As we know that perilipin protein is the function of inhibite the lypolisis process. It is be evidenced that perilipin knockout mice so basal adipocyte lipolysis was increased, resulting in a lean mouse [19,20,21,22]. The other research that finding low concentration of perlipin is related with high basal and cathecolamin that induction of lypolisis rate in the cell[21]. So many studies prove that perilipin protein have the function of inhibited the lypolisis process and it is be evidenced with increasing perilipin protein at obese[24,25]and that this study we found that concentration of perilipin protein was highest at obese with metabolic syndrome than obese non metabolic syndrome. However, further research needs to be investigated whether there is a correlation perilipin protein with the occurrence of metabolic syndrome

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