Relation between Body Mass Index with Triglyceride Levels At Coronary Heart Disease (CHD) At RSUP Haji Adam Malik Medan

*Rusdiana, 2Anitya Mareta

1Departement of Biochemistry, Faculty of Medical University of Sumatera Utara, Jl. dr. Mansur Kampus USU Medan 20155, Indonesia
2Student of Medical Faculty of University of Sumatera Utara, Jl.dr.Mansur Kampus USU Medan 20155, Indonesia

Abstract: The purpose of this study to correlate body mass index with triglyceride levels at coronary heart disease. This study is an analytic observational by using cross sectional design. Subjects of this study were 96 people with consecutive sampling method. Data retrieved by observing the patient's medical record from Haji Adam Malik Hospital Medan, North Sumatera, Indonesia. The result this study showed that 60 subjects CHD (62.5%) were male and as many as 36 subjects CHD (37.5%) were women. The largest age group suffering from this disease are aged between 60 to 74 years. Obesity Type I is the highest body mass index abnormalities in patients with CHD as many as 58 subjects (60.4%). Based on the analysis by the chi-square test p-value = 0.032 for BMI with triglycerides, which means there is a significant relationship. And conclusion that excessive body mass index had a significant relationship with levels of triglycerides.

Keywords: Coronary heart disease, body mass index, triglyceride.

I.Introduction.

Coronary heart disease is chronic (or long term) condition that affects many people. Coronary heart disease is when your coronary arteries that supply blood and oxygen to the muscle become clogged with fatty material called plaque or atheroma. Plaque slowly builds up on the inner wall of the arteries, causing them become the narrow. This process called atherosclerosis. Atherosclerosis is a process that can involves the coronary artery it results in coronary disease. The plaques made up of fat, cholesterol, calcium, and other substances found in the blood. If the arteries become too narrow, the blood supply to the heart muscle is reduce. The an area of the plaque can rupture, causing a blood clot to form on the surface of the plaque. If the clot becomes large enough, it can mostly or completely block the flow of oxygen rich blood to the part of the heart muscle fed by the artery. This can lead to angina or a heart attack.

The prevalence of obesity in Indonesia increasingly. Base of survey of Rikerdas at the 2013, increasing obesity for adult males from 13.9% at 2007 become 19.7%, for adult females kenaikan yang sangatekstrimmenteapai 18.1%, dari 14.8% pada tahun 2007 menjadi 32.9%. "Overweight or obesity tend to occur together with dislipidemia. It is caused by poor lifestyle and visceral fat accumulation so encourage development insulin resistance." Dislipidemia is lipid metabolism disorder, increasing or decreasing lipid fraction in the plasma. The main disorder lipid fraction is increasing total cholesterol levels, LDL cholesterol, Lipoprotein A, increasing triglyceride levels and decrease HDL level."
Increasing body mass index, so increasing the more likely the occurrence of lipid profile abnormalities. Among 60%-70% obesity and 50%-60% overweight were dislipidemia. Determination obesity base on the measured weight with dengah body mass index (BMI), weight badan in kilogram divide height in meter squared (kg/m²), waist size, (as visceral fat index, in cm), and waist-hip ratio, and skinfold thickness (cm). BMI > 28 kg/m² increasing risk morbidity like hypertension, stroke, ischemic heart disease till 3 to 4 times greater than general population. 

The main cause of coronary heart diseases narrow of major coronary artery proximal part by atherosclerosis. When major coronary artery luminal diameter diminish until more than 60 to 70% and cross sectional area diminish 10 to 15% from normal, so it cause myocardial ischemic myocardium hypoxia pain at even mild activity.

Obesity associated with increasing lipid and lipoprotein levels in the plasma. Abnormality lipid and cholesterol levels cause Memiliki kadar lipid atau kadar kolesterol yang abnormal dapat terkena kardiak koroner and kardiak koroner. Dimana pada obesitas ini berhubungan dengan peningkatan glikadik trigliserida dan penurunan kadar HDL. 

**Material and Method**

This study was conducted from August 2016 to November 2016, doing in Haji Adam Malik Medan hospital. This research observational analytic with Cross Sectional design. The subject in this research with consecutive sampling method. The researcher got 96 patients suitable with inclusion and exclusion criteria. The data were get from medical record Haji Adam Malik hospital Medan. Inclusion criteria: patients with medical record with coronary heart disease at 2015 and with cholesterol total levels, cholesterol LDL, cholesterol HDL, and triglyceride data completely from result laboratorium test at coronary heart disease diagnosis, and patients with medical record incompletely rekam were exclusion criteria.

**Table 1. Characteristics of Sample**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>60</td>
<td>62.5</td>
</tr>
<tr>
<td>Female</td>
<td>36</td>
<td>37.5</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>100</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 – 59 years</td>
<td>39</td>
<td>40.6</td>
</tr>
<tr>
<td>60 – 74 years</td>
<td>51</td>
<td>51.0</td>
</tr>
<tr>
<td>75 – 90 years</td>
<td>8</td>
<td>8.3</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>100</td>
</tr>
<tr>
<td><strong>Normal</strong></td>
<td>17</td>
<td>17.7</td>
</tr>
<tr>
<td><strong>Overweight</strong></td>
<td>14</td>
<td>14.6</td>
</tr>
<tr>
<td>Obesitas Tipe I</td>
<td>58</td>
<td>60.4</td>
</tr>
<tr>
<td>Obesitas Tipe II</td>
<td>7</td>
<td>7.3</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>100</td>
</tr>
<tr>
<td><strong>Trigliceride</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 150 mg/dl</td>
<td>53</td>
<td>55.2</td>
</tr>
<tr>
<td>&gt; 150 mg/dl</td>
<td>43</td>
<td>44.8</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>100</td>
</tr>
</tbody>
</table>
The characteristics of the subjects of this research are shown in Table 1. Subjects in this research were male were 60 people (62.5%) and female were 36 people (37.5%), found the subjects age range 75 – 90 years old were 8.3%. The mostly age range 60 – 74 years old were 51%. And 96 subjects, were obesity type I were 58 people (60.4%), with normal body mass index were 17 people (17.7%). Subjects with body mass index overweight were 14 people (14.6%) and subjects with type II obesity were 7 people (7.3%). Triglyceride levels we found 53 people ≤ 150 mg/dl and 43 people with Triglyceride levels > 150 mg/dl.

Table 2. Chi-Square analytic result Body Mass Index with Triglyceride levels.

<table>
<thead>
<tr>
<th>Body Mass Index</th>
<th>Triglycerida</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal (≤150 mg/dl)</td>
<td>Over (&gt;150mg/dl)</td>
</tr>
<tr>
<td>Normal (&lt;25kg/m²)</td>
<td>22 70.9%</td>
<td>9 29.1%</td>
</tr>
<tr>
<td>Over (≥25kg/m²)</td>
<td>31 47.6%</td>
<td>34 52.4%</td>
</tr>
<tr>
<td>Total</td>
<td>53 55.2%</td>
<td>43 44.8%</td>
</tr>
</tbody>
</table>

Base on the table we know that subjects with the normal body mass index with triglyceride normal levels were 22 people (70.9%), and the subjects with normal body mass index with over triglyceride levels were 9 people (29.1%). And then the subjects with over body mass index with normal triglycerida levels were 31 people (47.6%), and the other 34 people (52.4%) with over body mass index with over triglycerida levels too.

We used the statistical analysis with Chi Square test we found p-value = 0.032 (p<0.05), it means there is significant relationship between body mass index with triglyceride levels at coronary heart disease.

Discussion

This study we found the ratio male subjects and female subjects with percentage male the more with female. Male 60 people (62.5%) and female 36 people (37.5%). This study is the same with Tracey (2012) in Manado (Indonesia) he found 61.3% the male patients with acute coronary heart disease and 38.7% female. Ghanderi (2009) found the prevalence of acute coronary heart disease with obesity the more female (65.7%) than male (38%). The result of this difference maybe due to Ghanderi study is epidemiological studies that include various types of ethnic and many subjects.

The results we found the coronary heart disease patients the most age range 60-74 years old. View the result of Tracey study (2012) show that average age at coronary heart disease 60 years old. Increasing age, so prevalence of obesity will increase steadily until 50 years old (Martien,2003). It is caused that the age > 50 years old the style of society generally more relaxed and more stable economically, intake the high fat but low fiber (vegetables and fruits).

The obesity close relation with increasing cardiovascular disease. 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. An individual is called obesity if the BMI ≥30 kg/m², for Asian people obesity is defined if BMI>25 kg/m². Based on the study result found that coronary heart disease the most obesity type I (60.4%). The results of this study are consistent with the theory by American Heart Association (AHA) that obesity is classified as major modificiation risk factor. Wilson (2002) states increasingly BMI so increase incidence coronary heart disease.

Overweight prevention is the public health problem. It must be done by healthy lifestyle, like exercise, intake the food high in energy and intake fiber.

Base on table 2 shows that there is significance relation between body mass index with triglyceride levels (p=0.032). According to research Rustika (2014) high triglyceride had risk 1.5 at obesity coronary heart
disease respondents PJK the possibility of subjects diagnosed with coronary heart disease (with obesity) was also diagnosed Diabetes Mellitus. The research in Padang (West Sumatera) get high triglyceride levels (≥ 200 mg/dl) for obesity patients about 5.7% for male and 6.9% for female (Kamso, 2007).

Conclusion

The result this study found significance relation between body mass index with triglyceride levels at coronary heart disease.

References


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