ATLANTIS PRESS

*Advances in Health Sciences Research (AHSR), volume 14*

1st International Conference on Inter-Professional Health Collaboration (ICIHC 2018)

# Description Of Triglyceride Levels In The Elderly Who Have Hypertension

Vhira Nurjumareta
Jurusan Analis Kesehatan Politeknik Kesehatan Kementerian Kesehatan Bengkulu, Indonesia
vhirahendra@gmail.com

Dira Irnameria
Jurusan Analis Kesehatan Politeknik Kesehatan Kementerian Kesehatan Bengkulu, Indonesia
dirakimia04@gmail.com

Leni Marlina
Jurusan Analis Kesehatan Politeknik Kesehatan Kementerian Kesehatan Bengkulu, Indonesia
lenimarlina2775@gmail.com

***Abstract*—Triglyceride is one of the types of fat that can be found in the blood and various organ in the body that can cause problems for human health when the level is above the normal range or it can be called as hypertriglyceridemia. A highly level of triglycerides is one of the cause from the increasing of blood pressure. This research has an aim to determine the description of triglyceride levels from elderly who is suffering from hypertension. The method that used in this research is a descriptive method with laboratory examination. The samples in this research are 32 elderly people suffering from hypertension at Center for Elderly Care and Speech (Badan Pelayanan dan Penyantunan Lanjut Usia/BPPLU) Pagar Dewa Kota Bengkulu and the sampling method is total sampling technique. This sampling method is taking data with a measurement of the level of triglyceride using a spectrophotometer. The results of this research is known that 11 respondents of 32 respondents (about 34%) have abnormal triglyceride levels and 21 respondents of 32 respondents (66%) have normal triglyceride levels. It can be concluded that 34% from total respondents have abnormal triglyceride levels and 66% from total respondents normal triglyceride levels. The highly level of triglycerides can be the one of the factors causing hypertension.***

***Keywords—Hypertension, Triglycerides, Elderly***

## I. INTRODUCTION

Hypertension is one of the leading causes of death in the world's society. Hypertension or high blood pressure is an increase in systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg in two measurements with an interval of five minutes in a rest / quiet state. In the elderly population, hypertension is defined as systolic pressure ≥160 mmHg and diastolic pressure ≥90 mmHg. Long-term persistent (persistent) blood pressure can cause damage to the kidneys (kidney failure), heart (coronary heart disease) and brain (causing a stroke) if not detected early and receiving adequate treatment [1].

Based on WHO data in 2014 there are about 600 million people with hypertension worldwide which estimates hypertension to cause 9.4 million deaths and account for 7% of the world's disease burden. This condition can be a financial burden either because of the reduced productivity of human resources due to complications of this disease, as well as from the health system [2].

Basic Health Research (Riskesdas) in 2013 states that the prevalence of hypertension disease in Indonesia is 26.5%. With a total of 33 provinces, Bangka Belitung is the highest prevalence of 30.9% and the lowest prevalence in Papua is 16.8%, while the prevalence of hypertension disease in Bengkulu Province is 21.6% [3]. Another data from Bengkulu Provincial Health Office in 2016 data obtained the total number of cases of hypertension in Bengkulu Province that is 11,680 cases with a death rate as many as 198 inhabitants. The highest number of cases of hypertension in the city of Bengkulu with the number of cases as many as 522 cases with 37 deaths.

Kusmiati and Pratiwi in their research in 2015 explained that when people had the high blood pressures generally they had increased triglyceride level and blood fat. But it doesn't always happen like that [4].

The incidence of hypertension is very high especially in the elderly population (elderly) above 60 years, where the prevalence reaches 60% to 80% of the elderly population. It is estimated that 2 out of 3 elderly have [2]. Previous data from BPKU Pagar Dewa Kota Bengkulu 2016 shows that more than 50% of the elderly who are in it suffer from hypertension which amounted to 32 people from the total of 60 elderly.

Dyslipidemia is a change in elevated blood lipid profile levels including total cholesterol, triglycerides, LDL cholesterol or decreased HDL cholesterol. High blood levels of long-lasting blood lipids can cause thickening of blood vessels with the risk of narrowing of blood vessels [4]. Triglycerides are one component of the occurrence of dyslipidemia. Increased activity of lipolysis leads to increased levels of free fatty acids in the circulation resulting in dyslipidemia characterized by elevated triglycerides. Triglycerides play an important role in the pathophysiological mechanism of elevated blood pressure. So that is a potential factor for the control of hypertension. Normal levels of triglyceride levels are generally <150 mg / dL. The implications of abnormal triglyceride levels will have an increased risk of cardiovascular

disease, thereby decreasing the quality of public health [5]. Therefore, researchers are interested to know the description of triglyceride levels in elderly (elderly) who suffer from hypertension in the Hall of Sponsorship Prevention (BPPLU) Pagar Dewa Kota Bengkulu 2018.

## II. METHODS

This research method is descriptive with laboratory examination. The sample in this research is 32 people with sampling *total sampling technique.* Taking data with a measurement of triglyceride level using a spectrophotometer.

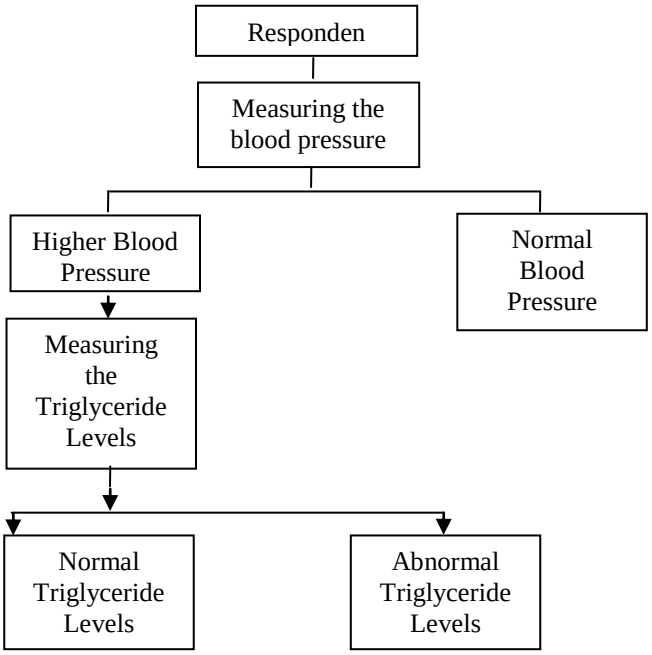


**Figure 1. Experiment Design Scheme**

The principle measurement of triglyceride level is triglyceride will be enzymatic hidrolized to become a gliserol and free fatty acid. The colours that formed from the sampel will be measured the absorbance (Triglyceride Levels) using a spectrophotometer. The absorbance will be converted to triglyceride level using this formula.

Formula of Triglyceride level (mg/dL)

$$= \frac{As}{Ast} x\ konsentrasi\ standar\ \left({}^{mg}/_{dL}\right)$$
$$= \frac{As}{Ast} x\ 200\ \left({}^{mg}/_{dL}\right)$$

**Figure 2. Formula of Triglyceride level**

As is absorbance of the serum and Ast is absorbance of triglyceride standard.

The chemical reaction that occurs in the measurement of triglyceride level are shown in Figure 3.

$$glyserol + ATP \xrightarrow{gliserol\ kinase} gliserol - 3 - phospate + ADP$$
$$gliserol - 3 - phospat + O_2\ glyserol\text{-}3\text{-}P$$
$$\xrightarrow{oksidase} Dihydroxyacetone\ phosphate + H_2O_2$$
$$2H_2O_2\ 4\text{-}Aminophenazone + 4\text{-}Chorophenol$$
$$\xrightarrow{Peroxide} Quinone\ imine + H_2O + HCl$$

**Figure 3. Chemical reaction from a measurement of triglyceride level using a spectrophotometer**

## III. RESULT

The results of this study were analyzed as univariate. Univariate analysis was used to see the frequency distribution of triglyceride levels in elderly (elderly) at the Dewa Service Center and Sponsorship of elderly (BPPLU) Pagar Dewa Kota Bengkulu. The results can be seen in table 1 below:

TABLE I. FREQUENCY DISTRIBUTION OF TRIGLYCERIDE LEVELS IN ELDERLY WHO HAVE HYPERTENSION

| Triglyceride Level | Frequency (F) | Percentage (%) |
|---|---|---|
| Abnormal | 11 | 34 |
| Normal | 21 | 66 |
| Total | 32 | 100 |

Based on table 1, it can be seen that 11 people (34%) of respondents had abnormal triglyceride levels and 21 people (66%) respondents had normal triglyceride levels.

## IV. DISCUSSION

This study mentioned that high blood pressure is not always followed by high triglyceride levels. Increased triglyceride levels can be caused by excess carbohydrates, lipids, or others. As a result, there is an accumulation in the blood vessels so that metabolism will be disrupted and cause the emergence of various symptoms of diseases such as hypertension [6].

Increased triglyceride levels are risk factors for coronary heart disease and stroke. High triglyceride levels also tend to cause blood pressure disorders and diabetes mellitus risk. High levels of triglycerides and blood lipids in the blood will cause sediment/plaque on blood vessel walls called *atheromatous plaques*. Various elements that makeup blood like red blood cells, platelets, fibers and lipid deposits will stick to the surface of the plaque. This plaque will grow larger and will reduce the diameter of the blood vessels so that it becomes narrow. Eventually, there will be a blockage of blood flow, so it takes great pressure to drain the blood throughout the body. When the muscle cells of the arteries buried in fat then the elasticity will disappear and less able to regulate blood pressure, the

result is in the form of hypertension, heart attack and stroke [4].

The results of interviews show that there is a few cause of abnormal triglyceride levels from respondents. The first is the lack of physical activity due to the decreased physiological function of the body due to the aging process that makes elderly difficult to move and perform sports activities such as gymnastics elderly. A person who regularly performs physical activity such as exercise can balance the levels of triglycerides in his blood because if the body lacks exercise it can cause fat accumulation in the adipose tissue [7]. In addition, 6 of the 11 respondents who had abnormal triglyceride levels were male and were known to be smoking. Smoking can also increase levels of triglycerides in the blood. Increased triglyceride levels due to carbon monoxide (CO) in cigarette smoke replace oxygen in the hemoglobin, thus disrupting the release of oxygen, and accelerate the occurrence of *atherosclerosis* (calcification of blood vessel walls). Carbon monoxide (CO) can decrease the capacity of physical exercise, increase the viscosity of blood, thus facilitating blood clotting [8]. Levels of triglycerides in the blood can be balanced by consuming vegetables, fruits that are high in fiber and vitamins in order to maintain the levels of triglycerides in the blood because the intake of excess fat is one factor that can increase triglyceride levels ie consumption of foods such as carbohydrates and fat [9].

Dyslipidemia is a condition in which abnormal blood lipid profile levels are present. Abnormal lipid profiles are increased total cholesterol, triglycerides, LDL cholesterol (Low-Density Lipoprotein) and/or decreased HDL cholesterol (High-Density Lipoprotein). High cholesterol, LDL, and triglyceride levels last long can cause thickening of blood vessels. The combination of hypertension and dyslipidemia conditions increases the risk of degenerative diseases, including coronary heart disease and stroke. This study is in line with the study [10], from his research shows that the largest number of samples is at age 65 years and over, the result of the average value of total cholesterol and LDL cholesterol is above the reference value while the average value of HDL cholesterol and triglyceride according to the reference value. For total cholesterol levels showed that from 30 samples there were 21 people (70%) of the samples had total cholesterol beyond the reference value (> 200 mg/dl), whereas the triglyceride level was obtained by the results of most samples with 26 people (86.7% ) had normal triglyceride levels and 4 people had triglyceride levels beyond the reference value. The relationship between dyslipidemia and hypertension has long been known and has been widely reported by many researchers, but the mechanism of hypertension due to dyslipidemia is still unclear. However, although not directly related, high triglyceride levels are one of the risk factors for increased blood pressure.

## V. CONCLUSION

In conclusion, there are 11 people or 34% of respondents had abnormal triglyceride levels and 21 people or most respondents (66%) had normal triglyceride levels.

## REFERENCES

[1] Kemenkes.Ri. (2014). Pusdatin Hypertension. *Information*, (Hypertension), 1-7.

[2] Arifin, MHBM, Weta, IW, & Ratnawati, NLKA (2016). Factors Associated With Hypertension Occurrence In The Elderly Group At Work Area Up Puskesmas Petang I Badung Regency 2016. *E-Jurnal Medika*, *5*(7).

[3] Agency for Health Research and Development. (2013). Basic Health Research. *Basic Health Research*, 1-306.

[4] Kusmiati, M., & Pratiwi, D. (2015). Health Journal Bakti Tunas Husada Volume 13 No. 1 February 2015. *Lipid Profile Profile In Hypertensive Patients In Setiajaya Village Tasikmalaya City*, *13*, 213-227.

[5] Riyadina, W., Kodim, N., Bantas, K., Trihandini, I., Ayu, R., Sartika, D, Jakarta, N. (2017). Triglycerides as a Prognosis Factor For Uncontrolled Hypertension in Post-Menopausal Women In Bogor City, 2014. *Health Research Bulletin*, *4*, 2-4.

[6] Hidayati, DR (2017). The Relationship of Fat Intake With Triglyceride Levels And The Correlation Between Fat Intake Index, Triglyceride Levels, And Body Mass Index (Bmi) Of The Academic Community From, 25-33.

[7] Sondakh, R., Pangemanan, D., & Marunduh, S. (2013). Influence of Elderly2. *Gymnastics Against TriglycerideInfluence of Elderly Gymnastics Against Triglyceride Levels*, *4*Level, 755-759.

[8] Oktarini, AL, & Mukaromah, SB (2015). Journal Of Sports Sciences And Fitness, *4*(4), 44-48.

[9] Tsalissavrina, I., Wahono, D., Handayan, D., & I. (2012). With High-Fat Diet Toward Triglyceride And Hdl Level In Blood. *Medical Brawijaya*, *Vol. Xxii*.

[10] Sumoked, Prisilia DD, Tendean, HMM, & Suparman, E. (2016). Profile of Female Lipids Menopause At Panti Werdha Damai Manado. *E-Clinic Journal (ECL)*, *4*, 95-96.