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Correlation between Lifestyle and Dyslipidemia of State Junior High School Teachers with Impaired Fasting Glucose in Makassar

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ABSTRACT

Background: Lifestyle (consumption patterns, smoking, stress levels and physical activity) with increasing or decreasing in HDL cholesterol and Triglyceride which are related and reacted because considering the HDL and Triglycerides has an impact on the blood vessel system that serves to provide life in vital organs such as the heart , brain, kidney, lung.
Objectives: This study aims to determine the relationship between lifestyle with dyslipidemia against high school teachers who suffer from fasting blood sugar in Makassar.
Materials and methods: The study included an observational type of study using a cross sectional design. The samples of the study were 55 teachers who were >30 years old who had a family history of DM and hypertension. The data collected were fasting blood glucose, dyslipidemia (HDL and Triglycerides), consumption patterns, smoking status, stress levels and physical activity. Pattern of consumption was assessed by using DQS (Diet Quality Score). Diet Quality Score results from the health value of the food, the adequacy of its micronutrients, the variety of food and the overall balance. Level of stress has been using Dass 21, while physical activity used PAR (Physical Activity Ratio). The data were analyzed by chi-square to look for lifestyle relationships (e.g. consumption patterns, smoking status, stress levels and physical activity) with dyslipidemia.
Result: The results show that most of the subjects are female (81.8%) with education level of almost all graduates (94.5%) who have a family history of DM disease (74.5%) and central obesity (69.1%). The results of the analysis have shown that there is a significant relationship between consumption pattern (DQS), HDL (p = 0,039), and triglyceride (p = 0,012). Unfortunately, there was not significant relationship between smoking status, HDL (p = 0.836), and Triglycerides (p = 0,573), stress levels with HDL (p = 0.805), and Triglycerides (p = 0,516), Physical Activity with HDL (p = 0.483),
Conclusions: lack of consumption patterns associated with the incidence of dyslipidemia (low levels of HDL and high triglycerides).

Key words: Fasting blood glucose, Lifestyle, Lipid profile.

INTRODUCTION

Individuals who have diabetes mellitus have an increased risk of cardiovascular disease (CVD) and premature death, [1] it is estimated that diabetes has contributed to an increased risk of death 1.8-fold. [2] In Indonesia nationally that the results of Basic Health Research (Riskesdas) in 2013 shows the prevalence of DM diagnosed by doctors 2.1% has increased compared to the year 2007 of 1.1%. The highest prevalence of diabetes diagnosed by doctors is in DI Yogyakarta (2.6%), DKI Jakarta (2.5%), North Sulawesi (2.4%) and East Kalimantan (2.3%). The highest prevalence of diabetes diagnosed by doctors or symptoms is in Central Sulawesi (3.7%), North Sulawesi (3.6%), South Sulawesi (3.4%) and Eastern Southeastern Island 3.3%. [3] According to Data Riskesdas's Data in 2013 showed that there are 3 regions that have the highest prevalence of DM in South Sulawesi based on diagnosis by doctors such as Pinrang (2.8%), Makassar (2.5%) and Tanah Toraja (2,3 %).

In a developing country, a diabetic will come from a group that has changed its lifestyle from traditional to modern.

Nowadays, the modern lifestyles that minimize physical movement, decreased striated muscle function, are followed by an increase in calorie and fatty dense intake which can lead to insulin resistance. Insulin resistance and damage to the pancreas is a cause of insulin resistance. Obesity and genetic factors are thought to play an important role in the process of insulin resistance, but there are other risk factors that include less physical activity, and unbalanced food intake. [4]

There are several studies that show that there is a relationship in lipid profile with diabetes mellitus. A study conducted in Sudan on 250 diabetes mellitus patients showed that there was an increase in triglycerides and a decrease in High Density Lipoprotein (HDL). In other studies also showed that most of the total cholesterol, triglycerides, and LDL are higher for people with diabetes mellitus. [5] The increase in total cholesterol, LDL and triacylglycerol levels and HDL decreases is a metabolic disorder known as dyslipidemia. The most common patterns of dyslipidemia for type 2 diabetics are elevated triglyceride levels and decreased HDL. [6]

Research conducted on women in Iran shows that a diet that can significantly be associated with the incidence of dyslipidemia. a Study in Korea shows that Adults have a carbohydrate diet pattern with the incidence of diabetes and obesity in Korea. [7] Similarly, Sargowo and Andarini's study in Malang showed that diet composition had a causal relationship with metabolic syndrome in which central obesity and dyslipidemia included total calories, fats and carbohydrates. [8] Kutsiyah et al's study in 2013 showed that subjects with high LDL cholesterol and high cholesterol levels tended to have lower fiber intake than normal. Meanwhile, subjects with triglyceride levels tend to have a higher fiber intake than subjects with high triglyceride levels. [9] Based on this problem, the authors are interested in conducting a scientific study in the form of research on "Lifestyle Relationships with “Dyslipidemia” in High School Teachers Who Has a Disturbed Fasting Blood Glucose in Makassar”, where every civil servant teacher has a high level of welfare so they have the purchasing power high on dietary sources of fat, not only that which causes sedentary life to increase in civil servant teachers and they represent as role models and educators for students who enable them to understand and adopt healthy lifestyles from their teachers from their teachers.

MATERIALS AND METHODS

Time and Location

This research is an observational research using cross-sectional method in May to August 2017. The location of the research was conducted in Secondary School (SMP and SMA) in Makassar City such as SMPN 25, SMPN 9, SMPN 8, SMPN 19, SMPN 30, SMPN 12, SMAN 7, SMAN 18, SMAN 10, SMAN 12, SMAN 21, and SMAN 6.

Population and the Sample of Research

The population in the study were all teachers in 12 schools of 595 people. The sample in the research was calculated using Lemeshow formula so that there were 135 samples. In this study also respondents who participated about 145 people and respondents who suffer from fasting blood sugar disturbed by 55 people.

Data Collection and Data Analysis

Data collection consists of primary data and secondary data. Primary data is obtained from direct measurement in field which consist of respondent characteristic data obtained through questionnaire sheets, while data about GDP is obtained by taking blood on the subject after fasting for approximately 8 hours, when the results of the examination indicate that the GDP number is ≥100 mg / dl then the subject has impaired GDP. Physical activity using questionnaires, biochemical data performed by laboratory officer, consumption patterns

through Recall 2x24 hours, smoking status, stress obtained through questionnaires. Secondary data were obtained from literatures, journals, theses, theses, dissertations, data from the Education Department of Makassar City South Sulawesi Province which is the data of all secondary schools and teacher data contained in Makassar City 2017. The research analysis used univariate and bivariate analysis. Univariate analysis describes the characteristics of all variables in the form of frequency distribution table, bivariate analysis using chi-square test to know the meaning relationship between dependent variable and independent variable which is categorical data, with 95% confidence and the α value of 5%.

RESULTS AND DISCUSSIONS

Result

There were a total of 145 respondents who followed the screening in this study. However, there are only 55 respondents who suffer from impaired GDP. Based on sex, the percentage of female teachers who became the largest sample of 81.8% compared to men only amounted to 18.2%. Based on age, there is more age ≥ 50 years of 72.7% compared to age <50 years of 27.3%. Based on the level of education, there are more at undergraduate education level of 94.5%. Based on the history of family illness, there is more found in teachers who have a history of diabetes by 74.5% while the lowest results seen in teachers who do not have family disease history of 5.5%. Furthermore, the results stated for the circumference of teachers who suffers the central obesity of 69, 1%.

The description of GDP, the Profile of Lipid Respondents

Table 1 shows that a subject GDP is in the range 100-400 with the mean value of 158.35 ± 77,448. Meanwhile, the results for male HDL are in the range of 21-56 with mean value (i.e. 42.55 ± 10,309). The result for female HDL is in the range 30-94 with mean value (mean) that is 51, 93 ± 12,604. Meanwhile, the results for triglycerides are in the range 54-454 with a mean value of 150.44 ± 67.079.

Table 1. The Mean, Standard of GDP Deviation and Lipid Profile of Respondents

Variabel	Minimum	Maximum	Mean ±	SD
GDP	100	400	158,35	77,448
Male of HDL	21	56	42,55	10,309
Female of HDL	30	94	51,93	12,604
Trigliserida	54	454	150,44	67,079

This data is the result of Mean ± SD GDP, Lipid Profile

Lipid Profile of High School Teachers Suffering from GDPT

The percentage of teachers who had higher low HDL levels was found in men (40.0%). Based on their age, the lower yield was <50 years (33.3%). In the education level, HDL levels were lower in teachers with undergraduate education (36.5%). according to family history shows that teachers with low HDL levels were higher in teachers who had a family history of hypertension of 36.4%. Moreover, the result for teacher trgliserida percentage that has triglyceride levels is higher in women (44.4%). Based on age, results were lower at age <50 years (26.7%). While, the results on the level of education triglyceride levels are higher in teachers with the level of post-graduate education (66.7%). As for the results of family disease history, as well as HDL there are teachers who have triglyceride levels in teachers who have a history of hypertension is 54.5%. The result can be seen in Table 2.

Table 2. Lipid Profile of a Secondary School Teacher Who Suffers GDPT

	HDL		Trigliserida	
Variabel	**Low**	**Normal**	**High**	**Normal**
	n (%)	**n (%)**	**n (%)**	**n (%)**
Sex				
Female	16 (35,6)	29 (64,4)	20 (44,4)	25 (55,6)
Male	4 (40,0)	6 (60,0)	3 (30,0)	7 (70,0)
Ages				
< 50	5 (33,3)	10 (66,7)	4 (26,7)	11 (73,3)
≥ 50	15 (37,5)	25 (62,5)	19 (47,5)	21 (52,5)
Education				
Graduate	19 (36,5)	33 (63,5)	21 (40,4)	31 (59,6)
PostGraduate	1 (33,3)	2 (66,7)	2 (66,7)	1 (33,3)
Hospital Chart Family				
Diabetes Melitus	13 (31,7)	28 (68,3)	14 (34,1)	27 (65,9)
Hypertension	4 (36,4)	7 (63,6)	6 (54,5)	5 (45,5)

Life style Relationships with Dyslipidemia (HDL, Triglycerides) a Teacher who suffers from GDPT.

Table 3 shows that the teachers whose consumption pattern was less have a low HDL level of 71.4% compared with teachers whose HDL levels were normal at 28.6%. Similarly in triglycerides, teachers whose consumption patterns were less likely to have high triglyceride levels were 85.7% compared with teachers who had a normal triglyceride level of 14.3%. Chi square test showed a significant relationship between consumption pattern with HDL (p = 0,039) and triglyceride (p = 0,012). So it can be concluded that there is a relationship between consumption patterns based on DQS with dyslipidemia. In terms of smoking status, most non-smoking teachers had normal HDL levels of 63.0% and triglycerides of 56.5%. Chi square test showed no significant relationship between smoking status with HDL (p = 0,836) and triglyceride (p = 0,573). As for the stress level, normal teachers have normal HDL levels of 62.8% and trgliserida of 60.5%.the Chi square test showed that there was no significant relationship between stress level and HDL (p = 0,806) and triglyceride (p = 0,516). While for physical activity most of the teachers who had mild physical activity had normal HDL levels of 61.4% and triglycerides of 54.5%. Chi square test showed no significant relationship between physical activity with HDL (p = 0,483) and triglyceride (p = 0,587).

Table3. Lifestyle Relationships with Dyslipidemia (HDL, Triglycerides) Teachers Experiencing GDPT

	HDL				TRIGLISERIDA	
(Variabel)	**Low**	**Normal**	**P**	**High**	**Normal**	**P**
	n (%)	**n (%)**		**n (%)**	**n (%)**	
Consumption Patterns (DQS)						
Deficient	5 (71,4)	2 (28,6)	0,039	6 (85,7)	1 (14,3)	0,012
Sufficient	15(31,2)	33 (68,8)		17 (35,4)	31 (64,6)	
Smoking Status						
Smoker/Ex-Smoker	3 (33,3)	6 (66,7)	0,836	3 (33,3)	6 (66,7)	0,573
Not a Smoker	17(37,0)	29 (63,0)		20 (43,5)	26 (56,5)	
Stress Level						
Stress	4 (33,3)	8 (66,7)	0,805	6 (50,0)	6 (50,0)	0,516
Normal	16(37,2)	27 (62,8)		17 (39,5)	26 (60,5)	
Physical Activity						
Mild	17(38,6)	27 (61,4)	0,483	20 (45,5)	24 (54,5)	0,587
Moderate	3 (27,3)	8 (72,7)		4 (36,4)	7 (63,6)	

P value: significant using chi-square

DISCUSSION

In developing countries, a diabetic who comes from a community group that changed his lifestyle from traditional to modern In an attempt to determine the lifestyle relationship (consumption pattern, smoking status, stress level and physical activity) with elevated levels of LDL cholesterol or decreased HDL cholesterol is very important, since considering the increase in cholesterol / HDL cholesterol decrease, it has an impact on the blood vessel system serves to provide vital organs such as heart, brain, kidneys, lungs and others. The importance of this study also has a preventive meaning against the possibility of many cases of certain body system disorders such as coronary heart disease, stroke and other diseases of the blood vessel system caused by the influence of low HDL cholesterol. South Sulawesi is the province with the highest prevalence of stroke incidence at age ≥15 years based on diagnosed nakes and the highest symptom is in South Sulawesi that is 17, 9%. There is a link between blood glucose levels and lipid profiles. In Diabetes mellitus patients, there will be insulin resistance that causes increased blood glucose levels, blood pressure, hyperinsulinaemia and fat function abnormalities that are marked by an increase

in blood cholesterol, LDL and decreased HDL or elevated levels of triglycerides in the blood which is an independent factor against heart disease. [10] Several studies have shown an association of lipid profiles with diabetes mellitus. A study conducted in Sudan on 250 diabetes mellitus patients showed an increase in triglycerides and decline High Density Lipoprotein (HDL). [11] Similarly, other studies also show that the mean total cholesterol, triglycerides, and LDL are higher in people with diabetes mellitus).

Lifestyle (consumption patterns, smoking status, stress level, physical activity) is a risk factor for dyslipidemia. For example, in a dietary pattern that affects most blood cholesterol levels, LDL is total fat, saturated fat and total energy. As for the cholesterol of food, only a few increase cholesterol depending on the amount of cholesterol eaten and the body's ability to compensate by synthesizing less. While plasma triglyceride levels are much influenced by carbohydrate and obesity. [12] Another mechanism that is suspected to cause a disruption in the lipid profile is an increase in free radical levels due to smoking, in both active and passive smokers. Excessive free radicals in the body cause increased oxidative stress, which can lead to increased lipid peroxidation, especially LDL. Oxidized LDL will trigger macrophages to fagos it LDL and will cause an increased accumulation of LDL in the blood vessel wall in the form of a foam cell. Smoking free radicals can also cause damage to the vascular endothelium, thus increasing the likelihood of atheroma plaque. [13] Other risk factors that can affect the lipid profile of stress in relation to blood fats are triggered by an increase in adrenaline hormone in the blood causing the levels of free fatty acids to increase. This causes an extra supply of energy but not accompanied by physical activity then the energy will be converted by the liver to cholesterol and triglycerides then circulate in the blood that can cause atherosclerosis as a factor trigger CHD and Stroke. [14,15] A study conducted by Avogaro in 2007 showed that other factors that have associations in the incidence of CHD in diabetes mellitus are microvascular complications and pharmacological therapy used by diabetics. [16] One of the risk factors for microvascular complications in diabetes is poor glycemic control. [17] Therefore, poor glycemic control is predicted to have a contribution to lipid profile change in type 2 diabetes mellitus patients. The poor lipid profile is one of the risk factors for CHD in type 2 diabetes mellitus. [18]

CONCLUSION

The study concluded that there were significant associations between consumption patterns (DQS) and HDL (p = 0.039), and triglycerides (p = 0.012). However, there was no significant correlation between smoking status with HDL (p = 0,836), and Triglycerides (p = 0,573), stress level with HDL (p = 0,805), Triglycerides (p = 0,516), Physical Activity with HDL (p = 0,483), and Trgliserida (p = 0.587).Reduced consumption patterns may be associated with low HDL and high triglycerides. Thus, respondents suggested to control and reduce the intake of foods high in fat and simple carbohydrates. In addition, it is also advisable to consume foods that are more varied so that respondents avoid certain nutritional deficiencies.Vegetables and fruit intake should be considered because many contain fiber that can be useful to suppress hunger and sugar addiction, can also lower blood cholesterol. the role of government in health promotion to teachers regarding the associated patterns of consumption, stress management, impaired GDP, and dyslipidemia so that they can understand what is being done for disease prevention and appropriate decision making for those already experiencing it. Researchers should further intervene against decreased levels of GDP, and triglycerides and increase levels of HDL in teachers who have prediabetes, diabetes or dyslipidemia.

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