Factors related to the event of hypercolesterolemia in Dr. Pirngadi Hospital Medan Year 2018

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Abstract

Hypercholesteromia is a condition when the concentration of cholesterol in the blood exceeds the normal limit. Hypercholesterolemia is a metabolic disorder that occurs primarily or secondary due to various diseases that can contribute to various types of diseases, especially cardiovascular disease. Hypercoleterolemia is closely related to hyperlipidemia and hyperlipoproteinemia. The purpose of this study was to determine the magnitude of the risk factors associated with the incidence of hypercholesterolemia in RSUD Dr Pirngadi Medan City in 2018. This type of research was an analytical observation study, with a cross sectional design. From the calculation of the sample above, it can be concluded that the number of samples in this study were 48 respondents. Samples were taken by using accidental sampling technique, namely outpatients and treatment for internal disease who were diagnosed with hypercholesterolemia in Dr Pirngadi Hospital, Medan. The results showed there was a relationship between smoking habits and the incidence of hypercholesterolemia. There is no association with obesity with the incidence of hypercholesterolemia. There is a relationship of physical activity with the incidence of hypercholesterolemia. Smoking is a factor that most influences the incidence of hypercholesterolemia in Dr Pirngadi Hospital in 2018. It is expected that health workers can provide counseling to patients who experience hypercholesterolemia especially for patients who have not experienced hypercholesterolemia so that an increase in HDL in the body can prevented early

Keywords: Obesity, physical activity, smoking habits Hypercholesterolemia.

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Introduction

Cholesterol is a chemical compound that is naturally produced by the body and structurally a combination of lipids (fats) and steroids and has an important role in the formation of bile acids, Vitamin D, Progesterone, Esterogens (estradiol, estron, estriol), Androgens (androsterone, testosterone), hormones glucocorticoid (cortisol) (Yovina, 2012).

Hypercholesteromia is a condition when the concentration of cholesterol in the blood exceeds the normal limit. Hypercholesterolemia is a metabolic disorder that occurs primarily or secondary due to various diseases that can contribute to various types of diseases, especially cardiovascular disease. Hypercoleterolemia is closely related to hyperlipidemia and hyperlipoproteinemia. Hypercoleterolemia can occur due to abnormalities of lipoprotein levels in the blood which in the long run accelerate the incidence of arteriosclerosis and hypertension which manifests in various cardiovascular diseases.

Hypercholesterolemia can occur due to genetic and unhealthy life styles, ranging from an unbalanced diet to lack of exercise. High cholesterol can be caused by cholesterol synthesis and high cholesterol absorption and also due to consumption of foods high in fat and carbohydrates (Hernawati, 2013).

Hypercholesterolemia is a risk factor for the cause of death at a young age, according to a report by the World Health Organization (WHO) in 2002 there were 4.4 million deaths due to CHD due to hypercholesterolemia or 7.9% of the total deaths at a young age. Based on data from the World Health Organitation (WHO) in 2012 showed 17.5 million people in the world die from cardiovascular disease or 31% of 56.5 million deaths worldwide.

The prevalence of hypercholesterolemia in Indonesia tends to increase. The 1998 MONICA (Monitoring Trends and Determinants of Cardiovascular Disease) and 1993 MONICA II in Jakarta showed an increase in the prevalence of hypercholesterolemia from 13.4% to 16.2% in the female population and 11.2% to 14% in the male population (Boedhi-Darmojo, 1993). Hypercholesterolemia is more common in men (36.2%) than women (31%) according to the National Health And Nutrition Examination Survey III taken (CDC, 2009).

Hypercholesterolemia can cause hypertension based on interviews from 7.6% in 2007 to 9.5% in 2013. The highest prevalence for hypercholesterolemia in Indonesia is CHD, which is 1.5%. From the prevalence, the highest figure was in the province of East Nusa Tenggara (4.4%) and the lowest was in Riau Province (0.3%). Based on age group, CHD is most common in the age group 65-74 years (3.6%) followed by the age group 75 years and over (3.2%), age group 55-64 years (2.1%) and age group 35 -44 years (1.3%).

Research conducted by Zakiyah (2012), from this study found that around 21.1% of workers in Pulo Gadung area experienced hypercholesterolemia, where work was related to blood cholesterol levels. The highest prevalence of hypercholesterolemia is found in food company workers followed by garment, chemical, construction, parts and steel companies. The lowest prevalence of hypercholesterolemia is found in workers in printing companies Overweight workers are associated with hypercholesterolemia.

When the researcher conducted a preliminary survey at Dr. Pirngadi Medan City researchers found the number of patients suffering from hypercholesterolemia in 2016 found the number of cases was 223 cases and in 2017 there were 235 cases of hyperlipoletesrolemia.

This shows that patients with hypercholesterolemia are still high in Dr. Pirngadi in Medan, because from year to year the number of cases of hypercholesterolemia remains high so there is a need for research to find out the Factors Associated with Hypercholesterolemia in Dr Pirngadi Hospital Medan City in 2018.

The formulation of the problem in this study is, "Factors Related to the Occurrence of Hypercholesterolemia in Dr. Pirngadi Medan City in 2018 ". The purpose of this study is to Analyze the Factors Related to the Occurrence of Hypercholesterolemia in Dr. Pirngadi city of Medan 2018.

The Method of The Research

This type of research is an observational analytic study, using a cross sectional design. The population in this study were all patients who were outpatient and declared to have hypercholesterolemia in Dr. Pirngadi in the city of Medan in 2018 with a total of 76 people from May to July, based on the clinical diagnosis the results of blood tests that suffer from hypercholesterolemia are if cholesterol is ≥200 mg / dl. With the number of populations suffering from hypercholesterolemia in 2018 as many as 76 people, then to calculate the minimum sample used formula (Lemeshow, S., et al, 1990) with a total sample of 48 respondents.

Data collection methods in this study include primary data and secondary data. Primary data was obtained by giving questionnaires to respondents while secondary data obtained from medical records of Dr Pirngadi Medan Hospital to find out the number of patients suffering from Hypercholesterolemia and those who did not suffer from Hypercholesterolemia.

The Result And The Discussion

Tabel 1. characteristics of respondents

NO	characteristics of respondents	F	%
1.	Age		
	40-49 year	9	18,75
	50-59 year	26	54,17
	>60 year	13	27,08
	Total	**48**	**100**
2.	Gender		
	Man	29	60,42
	Woman	19	39,58
	Total	**48**	**100**
3.	Education		
	Elementary school	-	-
	Middle school	5	10,42
	High school	25	52,08
	PT	18	37,50
	Total	**48**	**100**
4.	Work		
	IRT	4	8,33
	Employee	19	39,58
	entrepreneur	12	25,00
	PNS	13	27,09
	Total	**48**	**100**

From the table above it can be seen that the majority of respondents aged 40-49 years as many as 9 respondents or 18.75%. Respondents aged 50-59 years were 26 people (54.17%) and aged> 60 years as many as 13 people or 27.08%. Based on education, the majority of respondents were junior high school educated as many as 5 people or 10.42%, high school as many as 25 people (52.08%) and PT 18 people or 37.50%. Based on the work of IRT respondents, there were 4 people or 8.33%, employees were 19 people or 39.58%, entrepreneurs were 12 respondents or 25.00% and civil servants were 13 respondents or 27.09%.

Tabel 2. Distribution of Frequency of Respondents Based on Hypercholesterolemia

No	**Hypercholesterolemia**	**Frequency**	
		F	**%**
1	Yes	32	66,7
2	No	16	33,3
	total	48	100

From the table above it can be seen that the majority of hypercoleterolemia respondents were 32 people (66.7%), and not as many as 16 people (33.3%).

Tabel 3. Frequency Distribution of Respondents Based on Smoking Habits

No	Smoking Habits	Frequency	
		f	%
1	Yes	29	60,4
2	No	19	39,6
	total	48	100

From the table above it can be seen that the majority of respondents with smoking habits were 29 people (60.4%), who did not smoke as many as 19 people (39.6%).

Tabel 4. Frequency Distribution of Respondents Based on Obesity

No	Obesity	Frequency	
		F	%
1	Yes	23	47,9
2	No	25	52,1
	Total	48	100

From the table above it can be seen that the majority of respondents who were not obese were 25 people (52.1%), and those who were obese were 23 people (47.9%).

Tabel 5. Respondent Frequency Distribution Based on Physical Activity

No	Physical Activity	Frequency	
		f	%
1	Weight	20	41,7
2	Light	28	58,3
	Total	48	100

From the table above it can be seen that the majority of respondents with light activities amounted to 28 people (58.3%), while those with heavy activities were as many as 20 people (41.7%).

Tabel 6. The Relationship of Smoking Habits to the Occurrence of Hypercholesterolemia

Variable *independent*	Variable *dependent*(Occurrence of hypercholestrolemia)				Total		p-Value
	Yes		No				
	N	%	n	%	N	%	
Smoking Habits							
Yes	23	79,3	6	20,7	29	100 10	**0,022**
No	9	47,4	10	52,6	19	0	

From the table of analysis of the relationship between smoking habits and the incidence of hypercholesterolemia, the results of the chi-square test showed a significance value of less than 0.05, meaning that there was a significant correlation between smoking habits and the incidence of hypercholesterolemia at Dr Pirngadi Hospital in Medan in 2018.

From the results of the study it was found that respondents with smoking habits as many as 23 people (79.3%) were higher than respondents who did not experience hypercholesterolemia. The results of statistical analysis showed that there was a relationship between smoking habits and the incidence of hypercholesterolemia (p = 0.022). Smoking is one of the risk factors for hypercholesterolemia. This is in line with the research conducted by Mamat (2010) that light smokers 85.4% of HDL cholesterol levels are not normal and in moderate smokers is 89.6% and for heavy smokers is 92%. There is a relationship between smoking habits and levels of HDL cholesterol with p = 0.001.

Cigarette effects can cause myocardial burden to increase due to stimulation by catecholamines and decreased consumption of O2 due to CO inhalation or in other words can cause tahikardi, vasoconstriction of blood vessels, change the permeability of blood vessel walls and change 5-10 Hb to carboxy-Hb. This is the impact of smoking on the reduction of cholesterol levels caused by some cigarettes which are considered toxic, this is also evident in a study conducted by Aulia (2009) that in one cigarette there are more than 4000 types of chemicals, 40% of them are toxic. Hazardous chemicals, especially nicotine, tar, hydrocarbons, carbon monoxide and heavy metals in cigarette smoke. The risk of a smoker suffering from coronary artery disease is directly related to the number of cigarettes he smokes.

Tabel 7. Relationship of Obesity with Occurrence of Hypercholesterolemia

Variable *independent*	**Variable *dependent*(Occurrence of Hypercholesterolemia)**				**Total Value**		**p-**
	Yes		**No**				
	N	**%**	**n**	**%**	**N**	**%**	
Obesity							
Yes	14	60,9	9	39,1	23	100	**0,414**
No	18	72,0	7	28,0	25	10 0	

From the table of analysis of the relationship of obesity with the incidence of hypercholesterololemia, the results of the chi-square test showed a significance value greater than 0.05, meaning that there was no significant relationship of obesity with the incidence of hypercholesterolemia at Dr Pirngadi Hospital in Medan in 2018.

From the results of the study it was found that respondents who were obese and had hypercholesterolemia were 14 people (60.9%). The results of statistical analysis showed no relationship between fat or not respondents with the incidence of hypercholesterolemia (p =

0.414). This is in line with research conducted by Aziz Nugraha (2014) showing the results of the analysis with p = 0.773 (p> 0.05) that means there is no correlation between body mass index and total cholesterol level. The results of this study are also in line with the results of the Sara Sofia study, which concluded that there was no significant relationship between body mass index and total cholesterol levels. Body Mass Index (BMI) of obese people do not always have high cholesterol levels. High cholesterol is not always influenced by obesity, but is more influenced by consumption of foods that contain lots of meat, offal, and eggs that can increase cholesterol levels in the blood because in foods such as meat, offal and eggs there is a high cholesterol content (Sofia, 2008)

Tabel 8. Relationship between Physical Activity and Hypercholesterolemia

Variable *independent*	**Variable *dependent*(Occurrence of Hypercholesterolemia)**				**Total Value**		**p-**
	Yes		**No**				
	n	**%**	**N**	**%**	**N**	**%**	
Physical Activity							
Weight	10	50,0	10	50,0	20	100	**0,038**
Light	22	78,6	6	21,4	28	10 0	

From the table of analysis of the relationship of physical activity with the incidence of hypercholesterololemia, the results of the chi-square test showed a significance value of less than 0.05, meaning that there was a significant correlation between physical activity and the incidence of hypercholesterolemia at Dr Pirngadi Hospital in Medan in 2018.

From the results of the study it was found that respondents with severe physical activity and experienced hypercholesterolemia as many as 10 people (50.0%). The results of statistical analysis showed a relationship between physical activity with the incidence of hypercholesterolemia (p = 0.038). Research with the title of the relationship between food consumption and physical activity with blood cholesterol levels of adult men and women in Bogor stated that physical activity significantly affected blood cholesterol levels. Exercising can reduce LDL cholesterol and triglycerides levels and increase cholesterol HDL levels caused by reduced liver lipase activity that functions in the catabolism of HDL cholesterol (Waloya, 2013).

Physical activity is carried out regularly is very important in addition to avoiding obesity, can also help prevent the occurrence of diseases due to lifestyle patterns such as diabetes, heart attacks and strokes (Johnson, 1998). When doing physical activity. WHO recommends for moderate intensity physical activity for 30 minutes per day in one week or 20 minutes per day

for 5 days in a week with heavy intensity to get optimum results from physical activity / exercise (Rumiyati, 2008).

Tabel 9. Analysis of Double Logistic Regression Prediction Model of Factors Associated with the Occurrence of Hypercoleterolemia in Dr Pirngadi Hospital Medan City in 2018

No	Variable	B	Std.Eror	df	Sig	Exp (B)
1	Smoking Habits	21,156	11,35	1	0,022	1,541
2	Obesity	19,904	11,35	1	0,414	0,291
3	Physical activity	1,251	0,903	1	0,038	0,286
4	Constant	0,486	1,264	1	0,015	0,615

The results of multiple logistic regression analysis related factor prediction models with the incidence of hypercholesterololemia in Dr Pirngadi Hospital in Medan City in 2018 obtained the highest value of Exp (B) which is a smoking habit that is 1.541, meaning that the smoking habit will affect 1.541 times the incidence of hypercholesterolemia in Dr Pirngadi Hospital Medan in 2018.

From the results of multivariate analysis it can be concluded that the most influential factor on the incidence of hypercholesterolemia is smoking. Respondents who have a smoking habit have the chance to get hypercholesterolemia 1,541 times compared to respondents who do not smoke. Smoking habits are related to the onset of disturbances in lipid profiles, including an increase in LDL and VLDL, and a decrease in HDL levels. The habit of smoking can increase serum LDL levels through several mechanisms, which are not yet fully known, including the effect of the absorption of nicotine contained in cigarettes that triggers the release of catecholamines, cortisol and growth hormones. The release of this hormone will activate adenyl cyclase in adipose tissue, so it will increase liposis and release of free fatty acids into the plasma which will then be metabolized in the liver.

This is inversely proportional to the research conducted by Alfridsyah (2017) in obtaining results that smoking does not have a significant risk of CHD with a p value = 1.8 (CI; 0.84-3.7). Smoking can stimulate the process of arteriosclerosis because of its direct effect on the arterial wall, carbon monoxide causes arterial hypoxia, nicotine causes catecholamine mobilization which can cause platelet reactions, tobacco glycoproteins can cause arterial wall hypersensitivity reactions (Kusmana, 2003).

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minutes per day for 5 days in a week with heavy intensity to get optimum results from physical activity / exercise (Rumiyati, 2008).

The Conclusion and Suggestion

The Conclusion

1. There is a relationship between smoking habits and the incidence of hypercholesterolemia.
2. There is no association with obesity with the incidence of hypercholesterolemia.
3. There is a relationship of physical activity with the incidence of hypercholesterolemia.
4. Smoking habits are the factors that most influence the incidence of hypercholesterolemia at Dr Pirngadi Hospital in Medan City in 2018.

The Suggestion

1. Respondents exercise regularly to burn bad fat (HDL) in the body to reduce the risk of hypercholesterolemia.
2. For health workers to be able to provide counseling to patients who experience hypercholesterolemia especially for patients who have not experienced hypercholesterolemia so that an increase in HDL in the body can be prevented early by reducing smoking.
3. For further researchers it is expected to be able to conduct research with different research designs such as different cohort studies and measuring instruments so that the results can be more accurate.

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