Original article:

Lipid Profile in New and Recurrent Ischemic Stroke Patients at Haji General Hospital of North Sumatra Indonesia

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Abstract:

Introduction: Stroke refers to any sudden neurological disorder that occurs due to the cessation of blood flow through the arterial supply system of the brain. The etiology obstructions are atherosclerosis. There was an imbalance of lipid profiles in patients with ischemic stroke There was an imbalance of lipid profiles in patients with ischemic stroke. The objective of this research is to determine differences between lipid profile in new ischemic stroke patients with recurrent stroke at Haji General Hospital of North Sumatra Indonesia in 2015-2016. Methods: This is a cross-sectional study using total sampling method with a total of 64samples. Secondary data obtained from General hospital Haji Medan. Secondary data collected were data on lipid profile in patients with acute stroke and recurrent stroke by collecting medical records. Results: The result from the acute stroke patients found HDL levels of 33.97 mg/dl, recurrent stroke patients found HDL levels of 35.25 mg/dl. LDL levels in acute stroke patients were 109.56 mg/dl and recurrent stroke patients were 123.16 mg/dl. In new ischemic stroke patient, the average value of triglyceride levels was 143 mg/dl and the average value of total cholesterol was 205.8 mg/ dl. In recurrent ischemic stroke patient, the average value of triglyceride levels was 165.2 mg/dl and the mean total cholesterol level was 180.8 mg/dl. Discussion: There are no differences of lipid profile in new and recurrent ischemic stroke patients at Haji General Hospital of North Sumatra Indonesia in 2015-2016 (p>0.05)

Keywords: cerebrovascular disease, lipid profile, ischemic stroke.

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Introduction

According to the World Health Organization (WHO), stroke is a clinical symptom of focal or global cerebral dysfunction that lasts more than 24 hours or can cause death which does not have a clear cause other than vascular causes. Stroke is a health problem and needs special attention. Stroke causes suffering to sufferers, socio-economic burdens for sufferers' families, communities, and countries.^{1,2}

The distribution of diseases in Indonesia has also shifted from infectious diseases to tropical areas leading to chronic non-communicable diseases. The incidence of stroke in Indonesia ranges from 51.6 per 100.00 residents. The incidence of stroke in Indonesia ranges from 51.6 per 100.00 residents at the age of 45-55 years, 26.8% in the age range of 55-64 years, and 23.5% in the age group over

66 years. While the mortality rate from stroke in Indonesia based on age is 15.9%.³

The term stroke or cerebrovascular disease refers to any sudden neurological disorders that occur due to the restriction of blood flow through the arterial supply system.

The most common vascular pathology is atherosclerosis, fibro muscular dysplasia, arthritis, vascular dissection, and atherosclerotic plaque bleeding, where lipid material deposition occurs, fibrous and muscular tissue growth, and narrowed platelet adhesion can be a source of thromboembolism which causes extensive infarction when clogging the main branch intracranial blood vessels.⁴

Based on the existing literature, it is known that there is an imbalance of lipid profiles in ischemic stroke patients. In several studies said that there

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is a relationship between the levels of Very Low-Density Lipoprotein (VLDL) and Low-Density Lipoprotein (LDL) with ischemic stroke.

However, there is no correlation between the levels of High-Density Lipoprotein (HDL) and triglycerides in ischemic and hemorrhagic strokes. HDL and triglyceride levels play a greater role in the risk of heart disease.⁵

The purpose of this study was to determine differences between lipid profile in new ischemic stroke patients with recurrent stroke at Haji General Hospital of North Sumatra Indonesia in 2015-2016. **Materials and Methods**

The type of research used is descriptive analytic with retrospective design, where the study was conducted only at one time using medical records of new ischemic stroke patients and recurrent ischemic stroke in Haji General Hospital in 2015-2016. This research was conducted from August to December 2017.

Results

As many as 64 ischemic stroke patients based on sex, the most were female sex with 34 people (53.1%) while male sex is 30 people (46.9%).

Table 1. Characteristics of stroke patient

Variable		n	%
Sex	Male	30	46,9
	Female	34	53,1
Age (years)	35-43	3	4,7
	44-52	6	9,4
	53-61	19	29,7
	62-70	19	29,7
	71-79	11	17,2
	80-88	5	7,8
	89-97	1	1,6

Table 2. Distribution of frequency in new and recurrent ischemic stroke patients

Variable		New Ischemic Stroke		Recurrent Ischemic Stroke	
		n	%	n	%
Sex	Male	11	34,4	19	59,4
	Female	21	65,6	13	40,6
Age	35-43	1	3,1	2	6,3
(years)	44-52	4	12,5	2	6,3
	53-61	7	21,9	12	37,5
	62-70	11	34,4	8	25
	71-79	5	15,6	6	18,8
	80-88	4	12,5	1	3,1
	89-97	0	0	1	3,1

The average value of triglycerides in patients with new ischemic stroke is 143 mg/dl, while the average value of triglyceride levels in patients with recurrent ischemic stroke is 165.2 mg/dl. The average value of total cholesterol levels in patients with new ischemic stroke is 205.8 mg/dl, while the average total cholesterol level in patients with recurrent ischemic stroke is 180.8 mg/dl.

Table 3. Lipid profile mean values in new and recurrent ischemic stroke patients

Variables	Type of Ischemic Stroke	Mean (mg/dl)
Triglyceride	New	143
levels	Recurrent	165,2
Cholesterol	New	205,8
levels	Recurrent	180,8
HDL levels	New	33,97
	Recurrent	35,25
LDL levels	New	109,56
-	Recurrent	123,16

There is no significance difference between total cholesterol levels (P value=0.864), triglyceride levels (P value=0.231), HDL levels (P value=0.851), LDL levels (P value=0.497) in new and recurrent ischemic strokes patients.

Discussion

Based on the results of this study, the age group for the new ischemic stroke obtained the most is the age group 62-70 years as many as 11 people (34.4%). This result is in line with previous research at the Haji General Hospital Medan which received the age of acute ischemic stroke patients, aged 61-70 years old as many as 64 people (44.8%). These results are not in line with the research at the Haji Adam Malik General Hospital in Medan, where acute stroke patients are more often seen at the age of 45-65 years, as many as 59 people (66.3%). Whereas the most age in patients with recurrent ischemic stroke was the age group of 53-61 years as many as 12 people (37.5%). This result is not in line with Sari's (2015) research in Kertasura Health Center which received the most recurrent ischemic stroke at the age of 61-70 years. Based on the theory, the incidence of stroke is increasing with age. Stroke can occur at any age, but more than 70% of strokes occur at the age above 50 years.5,6

Based on the results of the study, it was found that female in new ischemic stroke patients in 2015-2016 in Haji General Hospital was as many as

21 people (65.6%). These results are in line with previous studies where acute stroke patients were more commonly found in female.⁶ While the highest sex in patients with recurrent ischemic stroke was male, e 19 people (59.4%). This is in line with research in Minahasa which gets the most sexes as many as 28 people. In another study by Dr. Kariadi Semarang which gets the most sex is male as many as 32 people (64.0%).^{7,8}

The most prevalent in new ischemic stroke patients are female because after menopause, the risk of women being equal to men for stroke. However, middle age women are better protected from heart disease and stroke due to the estrogen hormone they have.7 Estrogen has a function in regulating collagen in tunica media and regulating the integrity and thickness of blood vessels so that these hormones can reduce the risk of atherosclerosis. Estrogen can also prevent rupture of cerebral aneurysm through estrogen receptor activity which is a sub-type of estrogen receptor that is dominant in brain blood vessels.6 While the majority of male sex in recurrent ischemic stroke, because men have the greatest potential of risk factors for stroke including smoking, alcohol, obesity, and stress.5 The average value of triglyceride levels in patients with recurrent ischemic stroke was 165.2 mg/dl. This is in line with previous studies which obtained an average triglyceride level in patients with recurrent ischemic stroke is more than 150 mg/dl. While the average total cholesterol level in patients with recurrent ischemic stroke is 180.8 mg/dl. This is in line with previous research which found that the average triglyceride level in patients with recurrent ischemic stroke was >200 mg/dl. 9,10

The results of this study indicate that triglyceride levels and total cholesterol levels in ischemic stroke patients are not the main triggers for the incidence of stroke. This is in line with previous research which found that there was no significant relationship of atherosclerosis to the incidence of stroke. Accordance with previous studies conducted by Linda Soeroto who examined the relationship of LDL levels with non-hemorrhagic strokes where she used the Chi-square test and obtained the Odds Ratio value = 1.312 which means that patients who have high LDL levels are more at risk hemorrhagic 1.312 is greater than patients who have low LDL levels. In patients who have low LDL levels.

Conclusion, there is no differences in lipid profile in new and recurrent ischemic stroke patients.

Ethical Approval

This research proposal was accepted by the Ethics Committee of Faculty of Medicine, University of Muhammadiyah, Sumatera Utara, Indonesia.

Conflict of interest

None declared.

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Author's Contributions

Data gathering and idea owner of this study: MA Study design: LNP

Data gathering: MA

Data analysis and consultation: FRA Writing and

submitting manuscript: MA

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