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THE ANALYSIS OF RISK FACTORS AFFECTING STROKE DISEASE AT PRODUCTIVE AGES IN INDONESIA YEAR 2014 (A STUDY USING SECONDARY DATA IFLS 5)

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ABSTRACT

Introduction:According to the World Health Organization, more than two-thirds (70%) of the global population will die from non-communicable diseases such as cancer, heart disease, stroke and diabetes. In the United States, stroke is the number five cause of death and a major cause of serious disability for adults. There are around 795,000 people in the United States who suffer a stroke every year. Based on the diagnosis in the population aged > 15 years from 2013-2018, the prevalence of stroke in Indonesia has increased for the stroke sufferers. **Aim:** This study aims to analyze the risk factors that influence stroke at the productive ages in Indonesia in 2014. **Method:**The research design was observational analytic with cross sectional approach. This study took place in Indonesia with the secondary data from the Indonesia Family Life Survey (IFLS) Edition 5. The dependent variable is stroke itself, while the independent variables are age, sex, smoking status and the history of hypertension. The population in this study was all Indonesian citizens who became the respondents in the Indonesia Family Life Survey (IFLS) which was conducted in 13 of 33 Provinces. The sample of this research was the population aged > 15-59 years (productive age) and fulfilled the inclusion criteria; the data that was filled and processed was complete data, so it obtained 1,253,027 respondents.**Results:**Respondents aged 51-59 have 1.6 times risk of stroke. Men are 0.8 times less risky than women. Respondents who once smoked are 1.6 times more likely to have a stroke than those who smoke. Hypertension respondents have 2.5 times risk of stroke than those who are not. **Conclusion**:There is an influence between the factors of age, sex, smoking history and hypertension on the incidence of stroke.

Keywords: Risk factors, Stroke, IFLS

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INTRODUCTION

There are more than 36 million people die from Non-Communicable Diseases (NCD) (63% of all deaths) every year. There are more than 9 million deaths caused by NCD before the age of 60, and 90% of these "early" deaths occur in the low and middle income countries. Globally, the number one cause of death for NCD every year is a cardiovascular disease. It is a disease caused by impaired cardiac and blood vessel function, such as: Coronary Heart Disease, Heart Failure or Heart Disease, Hypertension and Stroke[10].

According to the World Health Organization, the deaths from NCD are predicted to continue increasing throughout the world. The biggest increase will occur in the middle and poor countries. There are more than two thirds (70%) of the global population will die from NCD such as cancer, heart disease, stroke and diabetes. By 2030, it is predicted that there will be 52 million deaths per year due to the NCD, which is up 9 million from 38 million. On the other hand, the deaths from the infectious diseases such as malaria, tuberculosis or other infectious diseases will decrease, from 18 million to 16.5 million by 2030[5]. In the United States, stroke is the number five cause of death and a major cause of serious disability for adults. There are about 795,000 people in the United States have a stroke every year[8]. In that country, someone experiences a stroke every 40 seconds and someone dies from a stroke every 4 minutes[2].

The prevalence of stroke in Indonesia based on diagnosis in the population aged > 15 years from 2013-2018 has increased. There were 7.0 per mile based on the diagnosis of health services in 2013, and it was increased to 10.9 per mile based on the diagnosis of the doctors in 2018[6].

There are risk factors for stroke, for instance, lifestyle changes, intake of foods containing too much sugar, salt, and fat, and lack of activity. There are many factors that cause stroke. These factors include risk factors that cannot be changed and risk factors that can be changed. The risk factors that cannot be changed include age, sex, race and genetics, while the risk factors that can be changed include hypertension, smoking, obesity, diabetes mellitus, unhealthy lifestyle, not doing routine medical checkups and consuming foods that contain lots of salt[12].

Based on the background, this study aims to analyze the risk factors that influence stroke at the productive age in Indonesia.

RESEARCH METHOD

This research uses observational analytic with Cross Sectional approach to see the relationship between dependent and independent variables. The dependent variable in this study is stroke, while the independent variables are age, sex, smoking status and history of hypertension. This study took place in Indonesia, where the object of the study was the household decision-making data taken from the Indonesia Family Life Survey (IFLS) Edition 5. The population in this study was all Indonesian citizens at the productive ages who became the respondents in the Indonesia Family Life Survey (IFLS) carried out in 13 of 33 provinces, totaling 161.736.594. The sample of this research was the population aged > 15-59 years (productive age) and fulfilled the inclusion criteria; the data that was filled and processed was complete data, so it obtained 1,253,027 respondents. This study utilized univariable analysis to describe the variables. Bivariable analysis was to determine the factors associated with stroke, and multivariable analysis which used the logistic regression analysis was to

find out how risky the independent variable is, so that all the data are analyzed using Stata software.

RESULT

The results of the bivariate analysis showed that by looking at the age group, there were 12,105 out of 12,253,027 respondents suffering from stroke, with the age group 24-32 years experiencing stroke the most by 3,330 (27.51%). In addition, the p value is 0.000 (< 0.05), which can be concluded as meaningful or there is a relationship between age and stroke incidence in Indonesia.

Data analysis showed that female respondents were more than male respondents. There were 6,575 (54.32%) female respondents who had a stroke. Furthermore, there were 5,530 (45.68%) male respondents who had a stroke so that a p value of 0.000 (< 0.05) was obtained which indicates a relationship between sex and the incidence of stroke in Indonesia.

The analysis showed that there were more respondents who did not smoke; 7,739 (63.93%) respondent with a history of stroke. In addition, there were fewer stroke patients in the group who once smoked; 892 (7.37%) respondents with a history of stroke with a p value of 0.000 (< 0.05), so it could be concluded as meaningful or there was a relationship between smoking status and the incidence of stroke in Indonesia.

From the table above, the history of hypertension shows that there are more respondents who did not experience hypertension and had stroke which were 8,882 (73%), while there were 3,223 (27%) respondents with a history of hypertension who had a stroke, with a p value of 0.000 (< 0.05), so it can be concluded meaningful or there is a relationship between the history of hypertension and the incidence of stroke in Indonesia.

Multivariable test results indicate that the age group has a relationship with the incidence of stroke with a p value of 0.000 and an OR of 1.6 which means that the patients aged 51-59 have a risk of stroke compared with the patients aged 15-23 years.

Based on the sex variable, it can be seen that gender has a relationship with the incidence of stroke with the p value < 0.05 and the OR value is 0.8 which can be concluded that male is 0.8 times less risky than female for stroke disease.

Based on the analysis that has been done, there is a significant relationship between smoking status and the incidence of stroke with a p value of 0.000 smaller than α and OR 1.6, which means that the respondents who have smoked have 1.6 times risk of stroke compared with the respondents who smoke to experience a stroke.

From the table, it can be seen that there is a significant relationship between the history of hypertension and the incidence of stroke with a p value of 0.000 which is smaller than the value of α and OR 2.5, which means that the respondents who have hypertension have a risk of 2.5 times compared with the respondents who do not experience hypertension.

DISCUSSION

The results showed that there was a relationship between age and stroke (p value 0.000). Someone aged 51-59 years are more at risk of stroke compared with someone aged 15-23 years. Accordig to Audina (2016), age is one of the risk factors

for someone having a stroke. The more the people get older, the greater the risk of having a stroke.

However, Malikhatin and Yovita (2017) affirmed that nowadays there is a tendency for the disease to be suffered by young age groups (< 40 years). It is caused by the lifestyle changes, especially for young people who live in urban areas, for example consuming fast food containing high fat, low fiber, smoking habits, drinking alcoholic water, being a workaholic, lack of exercise and stress.

Meanwhile, there is a significant relationship between sex and stroke (p-value 0.000) with the OR value 0.8. It shows that men are 0.8 times less risky than women. It basically depends on the lifestyle of each person. The bad habits in regulating the lifestyle and eating habit become things that can affect his health condition, so both male and female have similar opportunity to experience a stroke[1.]

According to Munir (2015), after menopause, male and female have the same risk for stroke and heart disease since the estrogen which initially acts as a protector of the atherosclerosis process has decreased. Many menopausal women in Canada die from strokes and heart disease than cancer every year.

Smoking is one of the factors that influence stroke. The above description shows that there is a relationship between smoking history and the incidence of stroke with an OR value of 1.6, which means that the respondents who have smoked are 1.6 times more likely to have a stroke than those who smoke. The smokers have higher blood fibrinogen levels compared to nonsmokers. The increased levels of fibrinogen can facilitate the thickening of blood vessels which makes blood vessels become narrow and stiff and cause disruption of blood flow, and a stroke occurs[9].

In this study, the respondents who had hypertension are 2.5 times more likely to have a stroke than thosse who do not. The hypertension is a major cause of stroke, whatever its type. The higher the blood pressure, the greater the risk of having a stroke. The hypertension causes impaired ability to autoregulate brain blood vessels. In acute high blood pressure, the blood pressure rises suddenly and very high causing sausage or bead string phenomenon due to forced dilation. This sudden high blood pressure breaks through the vasoconstrictive response and causes damage to the brain blood barrier by focal leakage of fluid through the arteries that have been stretched excessively and the formation of brain edema[11].

Someone who has hypertension and does not get medication and control on a regular (routine) basis can bring the sufferers into serious cases or even cause death. The high blood pressure experienced continuously causes the heart to work extra hard which results in damage to the blood vessels of the heart, kidneys, brain and eyes. This kind of hypertension is a common cause of strokes and heart attacks[4].

Hypertension will trigger the emergence of plaque deposits (atherosclerotic plaque) in large blood vessels. Plaque deposits will narrow the lumen / diameter of the blood vessels. Unstable plaques will easily rupture / break apart. The detached plaque increases the risk of clogging of smaller brain blood vessels. If it happens, stroke symptoms will occur[3].

CONCLUSION

There is an influence between the factors of age, sex, smoking history and hypertension on the incidence of stroke. People aged 51-59 are 1.6 times more likely to have a stroke than those aged 15-23 years. Male is 0.8 times less risky than female. The respondents who had smoked are 1.6 times more likely to have a stroke

than those who smoke. Last but not least, the respondents who had hypertension are 2.5 times more likely to have a stroke than those who did not.

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1. Bivariable Analysis of Factors Associated with Stroke in Indonesia

Table 01: Risk Factors Related to Stroke in Indonesia

Variable	Category				Total		p-value
	Non Stroke		Stroke				
Age Group (Year)							
	N	%	n	%	n	%	
15-23	365,266	29.4	2,792	23.06	368,058	29.37	0.000
24-32	293,939	23.7	3,330	27.51	297.269	23.72	
33-41	191,935	15.5	1,730	14.29	193,665	15.46	
42-50	211,046	17.0	1,906	15.75	212,952	17.00	
51-59	178,736	14.4	2,347	19.39	181,083	14.45	
Total	1,240,922	100	12,105	100	1,253,027	100	
Sex							
Female	628,776	50.67	6,575	54.32	635,351	50.71	0.000
Male	612,146	49.33	5,530	45.68	617,676	49.29	
Total	1,240,922	100	12,105	100	1,253,027	100	
Smoking Status							
Smoking	405,665	32.69	3,474	28.70	409,139	32.65	0.000
Once smoked	60,863	4.90	892	7.37	61,755	4.93	
Not Smoking	774,394	62.40	7,739	63.93	782,133	62.42	
Total	1,240,922	100	12,105	100	1,253,027	100	
Hypertension History							
Non Hypertension	1,088,990	88	8,882	73	1,097,872	88	0.000
Hypertension	151,932	12	3,223	27	155,155	12	
Total	1,240,922	100	12,105	100	1,253,027	100	

2. Multivariable Analysis of Factors Affecting Stroke in Indonesia

Table 2. Factors Affecting Stroke in Indonesia in 2014

Variable	OR	(95% Conf. Interval)	Sig.
Age Group (Year)			
15-23	1		
24-32	1.470991	1.398376 - 1.547376	0.000
33-41	1.16235	1.094344 -	0.000

		1.234582	
42-50	1.38213	1.317315 - 1.450133	0.000
51-59	1.631391	1.543605 - 1.72417	0.000
Sex			
Female	1		
Male	.8665294	.8358242 - .8983626	0.000
Smoking status			
Smoking	1		
Once smoked	1.643789	1.526214 – 1.770421	0.000
Not smoking	1.159723	1.113903 – 1.207427	0.000
Hypertension History			
Non Hypertension	1		
Hypertension	2.565703	2.463367 - 2.672291	0.000
-Cons	.006151	.0058458 - .0064722	0.000