Risk Factors of Stroke in Medical Rehabilitation Center Unit, Dr. Wahidin Sudirohusodo Hospital, Makassar

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Abstract

Stroke is the second cause of death after heart disease in developed countries that tends to increase in developing countries including Indonesia, especially in big cities. In Makassar itself stroke especially in Hospital Dr. Wahidin Sudirohusodo the case is fluctuative every year. This study aims to determine the risk of the incidence of stroke in the Medical Rehabilitation Unit at the General Hospital Center Dr. Wahidin Sudirohusodo Makassar in the year of 2012. The study was observational using a case control study. The case was stroke patients and control was non stroke patients. The analysis used was odds ratio and logistic regression.wth value $\alpha = 0,05$. The result of the study indicate that there is a significant correlation between stroke and hypertension OR = 36,938 CI 95% (10,566 – 129,137), heart disease OR = 4,105 CI 95% (1,622 – 10,387), Diabetes Mellitus OR = 3,088 CI 95% (1,257 – 7,590), Hiperkolesterolemia OR 7,497 CI 95% (3,236 – 17,365), smoking OR = 16,792 CI 95% (3,287 – 85,791), History of family OR = 7,502 CI 95% (3,021 – 18,629) and stress OR = 9,068 CI 95% (3,795 – 21,667. In conclusion Smoking is the most significant factor affecting in the stroke. It is suggested to control the blood pressure, glucose and blood cholesterol and lead to a health life.

Keywords: stroke; risk factor; incidence; medical rehabilitation.

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1. Introduction

Stroke is a neurological deficit that occurs suddenly, can be local or global, due to blockage or rupture of blood vessels supplying the brain for more than 24 hours.

Stroke was defined as a clinical manifestation of circulatory disorders of the brain and cause neurological deficits. Stroke can also be interpreted as a state of blockage of blood flow in the brain or the rupture of blood vessels in the brain, resulting in part of the brain injury which resulted in the function of several body parts cannot be controlled by the brain and paralysis / weakness half body known as hemiplegic [1,2].

Every year 15 million people worldwide are affected by stroke, while more than 5 million people die as a direct result of strokes and 5 million people are permanently disabled. In America, England and developing countries stroke is the No. 3 killer after heart disease and cancer. People who obviously suffer from hypertension have a risk of stroke seven times greater than those with normal or low blood pressure. People who suffer from heart problems such as angina, atrial fibrillation, heart failure, valve disease, prosthetic valve and congenital defects, increased risk of stroke, Diabetes or diabetes mellitus (DM) can cause a stroke due to the formation of atherosclerotic plaque in the walls of cerebral blood vessels [3,4].

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Smoking increases the risk of stroke 4-fold, this applies to all types of cigarettes (cigarettes, pipes or cigars) and for all types of stroke, smoking causes the narrowing and hardening of the arteries throughout the body (including those in the brain, heart and legs), so smoking encourage atherosclerosis, reducing blood flow and causing blood to clot easily. Smoking also increases intracranial aneurysm formation and growth of [9-11]

Hereditary very rarely the direct cause of stroke. However, the gene does play a major role in several risk factors such as hypertension, heart disease, diabetes and vascular disorders. Family history of stroke, especially if two or more family members had experienced a stroke at the age of approximately 65 years, increasing the risk of stroke [2, 19, 21].

In South Sulawesi appropriate health propyl 2007 stroke with CFR 14.9 is one of the causes of death of non-communicable diseases that require attention [10-16].

Data mortality caused by stroke at DrWahidin Sudirohusodo of 2010, each month ranks the top 15 causes of death in hospitalized patients, where the average every month there are 6 people died, either by a non-hemorrhagic stroke or hemorrhagic.

2. Materials and Methods

2.1 location of research

Location Research in Medical Rehabilitation Unit General Hospital Dr. WahidinSudirohusodo Makassar.

2.2 Research design

Research type used is observational research with case control study approach (case-management). In this study a comparison between the case group (stroke patients) and control group (not strokes) in which the risk factors explored by means of a retrospective. This design aims to know the greater the risk of Hypertension, Heart Disease, Diabetes, Cholesterol, smoking, physical activity, family history, stress on stroke [11,12].

2.3 Population and sample

The population in this study were all patients admitted to the General Hospital Dr. Wahidin Sudirohusodo Makassar in 2012. The sample consists of two sample cases are as follows: Patients with Stroke based diagnostics The incident was recorded on the status of patient records as many as 71 people. And Sample Control Patients who do not experience stroke based diagnosis is recorded in the status recording me Determination of the samples in this study using the table sample size for the study case-control studies with suspected odds ratio (OR) within 50% of OR true with 95 % where the OR of each variable can be seen from the results of other studies. The formulation used for the sample size in this study, according lameshow, 1997 patients were 71 people. So the sample size is 71 samples. With a ratio of 1: 1, the sample size in his study was 142 where the number of cases is 71 samples and controls was 71 samples.

Samples were selected by one of the non-random sampling technique, the technique of purposive sampling, where samples were taken on the basis of certain considerations which made the researchers themselves, based on the characteristics or properties that have been previously unknown population so the sampling is taken based on the criteria specified sample by researchers [7].

2.4 Method of collecting data

Secondary data derived from medical records at the Hospital Dr. Wahidin Sudirohusodo Makassar and primary data from interviews. Data retrieval charging observation sheet in the form of a checklist, through observation of the patient record by filling the questionnaire through direct interviews with respondents [18].

2.5 Data analysis

For a general analysis as a percentage and the distribution of each variable research, bivariate analysis form Odds Ratio test to determine the risk to the independent variables and the dependent variable for multivariate analysis to determine the effect of one or more of the independent variables on the dependent variable.

3. Results

3.1 Analysis research variables

Table 1 shows the general blood pressure hypertension respondents ie 95 (66.9%) and hypertension were not 47 people (33.1%), respondents generally do not suffer from heart disease, as many as 113 (79.6%) while suffering from illness heart 29 people (20.4%).

Table 1: Distribution of respondents according to blood pressure, heart disease, diabetes, cholesterol levels, smoking, physical activity, family history and stress at the Hospital Dr. Wahidin Sudirohusodo Makassar in 2012.

Variabel	n	%	Variabel	n	%
Blood Fressure			Smoke		
hypertension	95	66,9	Smoke	58	40,8
no hypertension	47	33,1	Do not Smoke	84	59,2
Amount	142	100	Amount	142	100
Heart desease			physical activity		
There is	29	20,4	Moderate	101	71,1
Nothing	113	79,6	Height	41	28,9
Amount	142	100	Amount	142	100
Desease DM			Family History		
There is	28	19.7	There is	39	27,5
Nothing	114	80,3	Nothing	103	72,5
Amount	142	100	Amount	142	100
Kadar Kolesterol			Stres		
Moderate	46	32,4	There is	46	32,4
Height	96	67,6	Nothing	96	67,6
Amount	142	100	Amount	142	100

Greater part of respondents did not suffer from diabetes mellitus or in other words having blood sugar is not more than 200 mg% as many as 114 people (80.3%) while suffering from Diabetes Mellitus or who have blood sugar levels when more than 200 mg% as much as 28 people (19.7%). Respondents who have cholesterol low levels (less than 200 mg%) as many as 96 people (67.6%) while having high blood cholesterol levels (200 mg% and above) as many as 46 people (32.4%.). most respondents do not smoke as many as 84 people (59.2%) and 58 people who smoke (40.8%). respondents who did moderate physical activity as much as 101 people (71.1%) and the high activity as many as 41 people (28.9%). respondents who did not have a family history of suffering a stroke as many as 103 people (72.5%), than those who have as many as 39 people (27.5%) suffered a stroke which family history. more respondents who do not suffer from stress as many as 96 people (67.6%), than those

who suffer from stress as much as 46 people (32.4%)

Table 2 shows that people who suffer from hypertension more likely to suffer a stroke (71.6%) compared with non hypertension (6.4%). Based on the test values obtained Odds Ratio OR = 36, 938 with the lower limit value = 10.566 and the upper limit value = 129.127. Because the value of the lower limit and the upper limit does not include value 1, the statistically significant with p = 0.000 This means that hypertension is a risk of stroke. OR value below 36.938 give meaning people with hypertension at risk of suffering a stroke 36.939 times greater than those who did not suffer from hypertension people who suffer from heart more likely to suffer a stroke (75.9%) compared with those who are not heart (42.4%).

Tabel 2: Variable relationship with the incidence of stroke in the study Hospital Dr. Wahidin Sudirohusodo Makassar in 2012

Reserach Variables	Status Responden				Number		OR LL-UL P Value
	Stroke		Non Stroke				
	n	%	n	%	n	%	
Hipertention							36,938
Hipertensi	68	71,6	27	28,4	95	100	
No hipertensi	3	6,4	44	93,6	47	100	10,566 -
Number	71	50	71	50	142	100	129.137
							P= 0,000
Heart desease							4,105
There is	22	75,9	7	24,1	29	100	1,622 –
Nothing	49	43,4	64	56,6	113	100	10,387
Number	71	50	71	50	71	100	P= 0,003
Diabetes Mellitus							3,088
There is	20	71,4	8	28,6	28	100	1,257 –
Nothing	51	44,7	63	55,3	114	100	7,590
Number	71	50	71	50	142	100	P= 0,019
Kolesterol							7,497
Hiperkolesteromia	37	80,4	9	19,6	46	100	3,236 –
No hiperkolesteromia	34	35,4	62	64,6	96	100	17,365
Number	71	50	71	50	142	100	P= 0,000
Smoke							5,733
Smoke	43	74,1	15	25,9	58	100	2,729 –
No Smoke	28	33,3	56	66,7	84	100	12,046
Number	71	50	71	50	142	100	

							P= 0,000
physical activity							1,411
Moderate	53	52,5	48	47,5	101	100	0,680 –
Height	18	43,9	23	56,1	41	100	2,928
Number	71	50	71	50	142	100	
							P= 0,459
Family History							7,502
There is	32	82,1	7	17,9	39	100	3,021–
Nothing	39	37,9	64	62,1	103	100	18,629
Number	71	50	71	50	142	100	
							P= 0,000
Stres							9,068
There is	38	82,6	8	17,4	46	100	3,795–
Nothing	33	34,4	63	65,6	96	100	21,667
Number	71	50	71	50	142	100	
							P= 0,000

Based on the test odds ratio values obtained OR = 4.105 with a value lower limit 1, 622 and the value of the upper limit of 10.387 for value lower and upper limit does not include the value 1, the statistically significant with p = 0.003 gives the sense that people who suffer from heart disease at risk suffered a stroke 4.105 times greater than those with heart disease, those who suffer from Diabetes Mellitus more stroke (71.4%) of the non-Diabetes Mellitus. Based on odds ratio test obtained value OR = 3,088 with a value lower limit upper limit value of 1.257 and 7.590, because the lower limit and the limit value does not include the value 1 statistically even though the value of p = 0.019. This means that DM is a risk factor for stroke, OR Value 3.088 gives the sense that people who suffer from diabetes are at risk for suffering a stroke 3,088 times greater than the non-DM. hiperkolesteromia people are more likely to suffer a stroke (80.4%) than from not hiperkolesteromia (35.4%). Based on the test values obtained Odds Ratio OR = 7.497 with the value of the lower limit and upper limit = 3.236 = 17.365, since the value of the lower limit and the upper limit does not include the nilia1 statistically significant with p = 0.000. This means hiperkolesteromia is a risk factor for stroke. Value OR = 7.497 meaning that people who suffer from the risk of having a stroke hiperkolesteromia 7.497 times greater than that do not suffer hiperkolesteromia .The who smoke more stroke (74.1%) compared with non-smokers (33.3%) .. Based on the test obtained value Odds Ratio OR = 5.733 with a lower limit value of 2.729 and the upper limit of 12.046. Because this value does not include the value of 1, the statistically significant with p = 0.000. This means smoking is a risk factor for stroke, the value OR = 5.733 gives the sense that people who smoke have a risk of stroke by 5.733 times than those who do not smoke. physical activity people were more affected by stroke (52.5%) than those with high physical activity (43.9%). Based on the test values obtained Odds Ratio OR = 1,411 with the lower limit value of 0.680 and the upper limit of 2,928, with a value of p = 0.459, so it was not statistically significant. Because this value includes the value of 1 means that he is a protective factor, so

physical activity is not a risk factor for stroke. People who have a family history of stroke more stroke (82.1%) than those with no family history of patient stroke (37.9%). Based on the obtained value Odd Ratio Test OR = 7.502 with a lower limit value = 3.021 and the upper limit value = 18.629. Because this value does not include the value 1 statistically significant with p = 0.000, this means that family history is a risk factor for stroke. Value OR = 7.502 gives the sense that people who have a family history of stroke at risk of suffering a stroke 7.502 times greater than those who do not have a family history of stroke. the more stress who stroke (82.6%) compared with no stress (34.4%). Based on the test values obtained Odds Ratio OR = 9.68 with a lower limit value of 3.795 and an upper limit value of 21.667. Because this value does not include the value of 1, the statistically significant with p = 0.000. This means that the stress factor is a risk factor for stroke. Value OR = 9.68 shows that people who are stressed have 9.68 times the risk of suffering a stroke than those without stress.

Table 3: Multivariate Analysis Stroke in Dr Wahidin Sudirohusodo Makassar in 2012

Jenis Variabel Bebas	B	P	OR	C1 95%	
				Lower	Upper
Tension	0,983	0,478	2,673	0,176	40,5033
Heart Desease	20,813	0,998	1,09	0,000	
Diabetes Mellitus	1,095	0,440	2,990	0,186	48,060
Kolesterol	1,183	0,312	3,264	0,329	32,380
Smoking	3,322	0,003	27,725	3,005	255,818
Stres	1,682	0,136	5,376	0,590	49,009
Constant	-55,273	0,998	0,000		

Table 3 shows the results of multivariate analysis obtained by inserting variable statistically significant on bivariate analysis, and variables that are considered important writer, though not significantly. Found there are six significant variables are hypertension OR = 2.673, heart disease with OR = 1.09, OR = 2.990 Diabetes, Cholesterol OR = 3.264, OR = 27.725 smoking and stress OR = 5.376. Of the six variables that influence the incidence of stroke, risk factors that most influence is smoking with OR = 27.725.

4. Discussion

A fairly high incidence of hypertension found in the respondent, made possible because of the prevalence of hypertension that occurred in the city of Makassar. The factors that can cause is high salt consumption by the public, Pathophysiology of hypertension resulting in stroke, made possible through the mechanism of sheer stress, in which the blood pressure increases, slowly will damage the blood vessel walls to harden the arteries and encourage the formation of blood clots and aneurysms all lead to a stroke [8].

The incidence of heart disease is also caused by several factors, the most commonly found any circumstances

hypertension, high cholesterol and smoking. Therefore, patients who have these risk factors are likely also will result in the onset of heart disease, heart disease that eventually this will also lead to stroke [9].

Diabetes Mellitus is a collection of symptoms that arise in a person caused by an increase in blood sugar as a result of absolute and relative insulin deficiency. Diabetes mellitus is a group of metabolic diseases with characteristic hyperglycemic disorder that occurs in a state of insulin is associated with long-term damage, dysfunction or failure of multiple organs such as eyes, kidneys, heart and blood vessels, including the blood vessels of the brain 10. Increased levels of cholesterol as referred to above relate to the wrong diet. In a Makassar society preferred food is a food that is high in cholesterol, so for those who consume these foods excessively will increase cholesterol levels in the blood. High levels of blood cholesterol will accumulate in the blood, especially the blood vessel wall which eventually lead to blockage of blood flow in the blood vessels of the brain resulting in a stroke [11 13 20 23].

Doing physical activity will keep us from various diseases, with adequate physical activity that we can suppress the increase in blood sugar levels, cholesterol levels, and avoiding obesity and strengthen the heart. Where it is a risk factor for stroke. Thus with sufficient physical activity we can avoid a stroke. Abnormalities descent are rarely the direct cause of stroke. However, the gene does play a major role in some of the risk factors for stroke, such as hypertension, heart panyakit, diabetes and vascular disease. Family history of stroke, especially if two or more family members who had suffered a stroke at the age of less than 65 years, increasing the risk of stroke [2].

Prevention is always better than cure. While strokes are preventable, why not try? First, by running healthy behavior early on. Second, control of risk factors should be run optimally. Third, do a medical check up regularly and periodically and the patient must recognize the early signs of stroke[12,24]. To prevent "the silent killer" This then someone recommended to reduce smoking, taking regular exercise, limiting alcohol, and avoid excessive stress. All the above risk factors are hypertension, heart disease, high cholesterol, diabetes mellitus, family history is a resource of smoking and stress [13].

5. Conclusion

Life style alias lifestyle and diet has always been the black sheep of various risk factors for stroke. Most people often apply unhealthy diet with frequent eating fast food is loaded with fat and cholesterol but low in fiber. For those of reproductive age that life is still a long journey to be able to take part and compete with other human resources from abroad. So that from now required setting lifestyle and diet to avoid stroke risk factors.

Acknowledgments

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