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Relationship between early treatment and extent of neurological damage in stroke patients

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ABSTRACT

Stroke is a disease that has a high mortality and disability rate, stroke sufferers need fast and precise treatment, especially at the golden time where it is the best time to deal with stroke. This study aims to determine the relationship between initial treatment and the extent of neurological damage to stroke patients. This researcher also uses quantitative methods with a cross-sectional approach. Meanwhile, sampling is carried out using non-probability sampling techniques, the type of total sampling with independent variables is the initial handling of stroke at home and the dependent variable, namely neurological damage that occurs. The results showed that the initial treatment carried out at home by the family was not related to the neurological damage of stroke patients. The initial treatment of stroke was only related to the stiffness experienced by respondents. Meanwhile, the initial treatment of stroke is not related to feeling bad, visual impairment, dizziness, confusion, balance disturbance, headache, paralysis, loss of taste, impaired field of view, difficulty forming words, unable to speak, impaired perception, impaired orientation, and level of consciousness.

INTRODUCTION

Stroke has a high mortality and disability rate. Stroke is the main cause of physical disability in productive age and old age. In developed countries, stroke is the number 1 cause of hospital admissions, with 20% of deaths within the first 28 days of treatment. According to World Stroke Organization that 1 in 6 people in the world will have a stroke in their lifetime, while the data American Health Association (AHA) states that every 40 seconds there is 1 new case of stroke with a prevalence of 795,000 new or repeated stroke patients occurring each year and approximately every 4 minutes there is 1 stroke patient dies (Mutiarasari, 2019).

Stroke is an acute focal or global functional brain disorder due to obstruction of blood flow to the brain due to bleeding or blockage (Caplan et al., 2022; Losseff et al., 2016; Peisker et al., 2017; Venkat et al., 2017; Whitehead, 2022), with symptoms and signs according to the part of the brain affected, which can heal completely, heal with disability, or death (Yuanita et al., 2015). Stroke or brain attack is a clinical syndrome that has a sudden, progressive, rapid onset in the form of focal and/or global neurological deficits, lasting 24 hours or more or directly causing death, and is solely caused by non-traumatic cerebral circulatory disorders (Khairunnisa et al., 2014).

According to Feigin in Anggriani et al. (2018), stroke symptoms can be physical, psychological and behavioral. The most characteristic physical symptoms are paralysis, weakness, loss of sensation in the face, arms or legs on one side of the body, difficulty speaking, difficulty swallowing and partial loss of vision on one side. A person is said to have a stroke if one or any combination of the above symptoms lasts for 24 hours or more.

Treatment of stroke patients, especially new patients, should be done quickly and precisely. Certainty of early determination of the type of stroke pathology is very important for the administration of appropriate drugs to prevent more fatal effects (Arifianto et al., 2014).

Collected from Otcdigest.com (2017), cure or severity of disability is determined by the speed of treatment. There is a "golden period" in which brain cell damage can be minimized, namely help is carried out a maximum of 4-5 hours after a stroke. According to Dr. Farhan in Satria (2021), Golden time period is the

best time to deal with stroke. If we can reach this time then the results are better, compared to when treated (or taken to the doctor) after a day, two days, or even after a week before being taken to the hospital, it is too late.

Based on the description above, stroke patients need quick treatment if it is too late it will be fatal. So researchers are interested in conducting a study on the relationship between early treatment and the extent of neurological damage of stroke patients. Hopefully, the research can shed a light on the discussed knowledge and become a reference for future research.

METHOD

The research design chosen in this study is quantitative with an approach cross sectional. This approach is used to measure and observe both variables, namely the independent variable and the dependent variable at the same time, which is carried out to determine the relationship between early stroke treatment at home with the extent of neurological damage in stroke patients. Design cross-sectional is a research design with data collection of more than one case or variable and carried out at one particular time (Anwar, 2020).

Population Sampling is done using techniques non probability samplingkind total sampling. This technique is also called non-random sampling technique, which is random research sampling (Supardi, 1993). This research was conducted at Citra Sari Husada Hospital, Karawang. In this study using data collection instruments in the form of questionnaires. The questionnaire was prepared based on guidelines from the AHA and validity tests were carried out on 30 respondents and only questions with a calculated r value of > 0.5 were included in the study.

The independent variable in this study is the initial treatment of stroke at home, is the action taken from the start of the attack until the patient is taken to a health facility. Meanwhile, the dependent variable is neurological damage that occurs and is the result of the researchers' study in the form of motor disorders (paralysis, balance disorders, difficulty forming words, cannot speak, stiff), sensory disorders (loss of taste, visual disturbances, numbness), orientation disorders (time, place, people) and impaired perception, as well as headaches and levels of consciousness. All these neological damages are made in 2 categories namely yes and no.

RESULTS AND DISCUSSION

Table 1. Family characteristics of the patient

Variable	n	(%)
Gender		
Man	9	30
Woman	21	70
Work		
Civil servants	3	10
Retired civil servants	2	6
Farmer	5	17
Private	8	27
House assistant	12	40
Education		
Does not finish elementary school	2	7
Finish elementary school	9	30
Junior high school	3	10
Senior high school	9	30
Higher education	7	23

Based on the table above, it shows the data of respondents who accompanied when collecting data based on gender, occupation, and education categories. Family members who attended the hospital were 9 people or 30% men, and as many as 21 people or 70% women. The respondents' jobs were 3 people or 10% civil servants, 2 people or 6% retired civil servants, 5 people or 17% farmers, 8 people or 27% private, and as many as 12 people or 40% house assistant.

Then the education of respondents as many as 2 people or 7% did not finish elementary school, as many as 9 people or 30% graduated from elementary school, as many as 3 people or 10% graduated from junior high school, as many as 9 people or 30% graduated from high school, and as many as 7 people or 23% graduated from college.

Table 2. Characteristics of stroke patients

Variable	n	(%)
Gender		
Man	16	53
Woman	14	47
Work		
Civil servants	5	16
Retired civil servants	2	7
Farmer	4	13
Private	5	17
House assistant	14	47
Education		
Does not finish elementary school	2	6
Finish elementary school	10	32
Junior high school	4	11
Senior high school	7	22
Higher education	9	29

Table 2 shows data on stroke patients by gender, occupation, and education categories. Stroke patients in the hospital were 30 people with 16 people or 53% men, and as many as 14 people or 47% women. The work of patients is 5 people or 16% of civil servants, as many as 2 people or 7% of retired civil servants, as many as 4 people or 13% of farmers, as many as 5 people or 17% of private companies, and as many as 14 people or 47% of IRT.

Education patients as many as 2 people or 6% did not finish elementary school, as many as 10 people or 32% graduated from elementary school, as many as 4 people or 11% graduated from junior high school, as many as 7 people or 22% graduated from high school, and as many as 9 people or 29% graduated from college.

Table 3. Respondent-Patient Relationship

Family Relationships	n	(%)
Wife/Husband	15	50
Biological child/in-law	10	32,5
Siblings	5	16,5

Table 3 shows the relationship between respondents and patients, namely as many as 15 people or 50% wives / husbands, as many as 10 people or 32.5% children / daughters-in-law, and as many as 5 people or 16.5% who are siblings.

Table 4. History of Disease and Habits of the Patient

History of Disease and Habits	n	%
Hypertensive		
None	9	30
Exist	21	70
Diabetes Mellitus		
None	20	67
Exist	10	33
Heart Disease		
None	24	80
Exist	6	20
Smoke		
None	17	57
Exist	13	43
Consumption of fatty foods		
No	4	13
Yes	26	67
Regular exercise		
No	21	70
Yes	9	30

Table 4 shows most respondents had a history of hypertension, no history of Diabetes Mellitus, no history of heart disease, smoking, consuming fat, and not exercising regularly.

Table 5. Types of Stroke according to CT-Scan

Types of Stroke	n	(%)
Non Hemorrhagic	25	83
Hemorrhagic	5	17

Table 5 shows the characteristics of stroke suffered by patients with this type of stroke classified based on CT-Scan results. The most common type of stroke is non-hemorrhagic stroke at 83%

Table 6. Early Stroke Meal and Medical Treatment Hours

Handling	n	%
Home Handling		
Not Good	17	57
Good	13	43
Medical Treatment		
< 3 Hours	11	37
> 3 Hours	19	63

Based on the table above, it can be seen that the handling at home is not good 17 people or 57%, and 13 people or 43% are good. While medical treatment patients get medical treatment after 3 hours as many as 19 people or 63%.

Table 7. Signs of neurological damage experienced by the patient

Neurological disorders	n	%	Neurological disorders	n	%
Numbness			**Difficult to form words**		
None	12	40	None	14	47
Exist	18	60	Exist	16	53
Vision disorders			**Cannot speak**		
None	23	77	None	21	70
Exist	7	23	Exist	9	30
Looks confused			**Headache**		
No	13	43	No	4	13
Yes	17	57	Yes	26	87
Dizzy			**Perceptual disorders**		
No	6	20	No	23	77
Yes	24	80	Yes	7	23
Balance disorder			**Orientation disorders**		
No	5	17	No	28	93
Yes	25	83	Yes	2	7
Feeling stiff			**Paralysis**		
No	6	20	No	14	47
Yes	24	80	Right	6	20
			Left	9	30
Loss of taste			Neck down	1	3
No	20	67			
Yes	10	33			
Field of vision disturbances			**Level of consciousness**		
No	19	63	Compos Mentis	26	87
Yes	11	37	Somnols	4	13

The most sign of neurological damage experienced by patients is 60% numbness. Patients did not experience visual impairment 77%, but felt confused 57%; dizziness 80%, impaired balance 83%, stiffness 80%, loss of taste 67%, visual field disturbance 37%, difficulty forming words 53%. Patients could not speak 70%, headache 87%, but did not have perception disorders 77%, and did not experience orientation disorders 93%. Left side paralysis is mostly 30%. Patients in compos mentis consciousness level 87%.

Table 8. The Relationship Between Early Treatment of Stroke and Neurological Damage

Signs of Neurological Damage After Stroke		Initial Handling				Total	*P*
		Good		Less			
		n	%	n	%		
Numbness	No	5	42	7	58	12	0,545
	Yes	8	44	10	56	18	
Vision disorders	No	8	35	15	65	23	1,002
	Yes	5	71	2	19	7	
Confused	No	7	54	6	38	13	0,671
	Yes	9	53	8	47	17	
Dizzy	No	4	67	2	33	6	0,134
	Yes	9	37,5	15	62,5	24	
Balance disorder	No	4	80	1	20	5	1,000
	Yes	9	36	16	64	25	1,242
Body paralysis	No	4	29	10	71	14	0,576
	Right	1	17	5	83	6	
	Left	1	11	8	89	9	
	Neck down	0	0	1	100	1	
Stiff	No	4	67	2	33	6	0,037
	Yes	4	17	20	83	24	
Loss of taste	No	6	30	14	70	20	0,337
	Yes	2	20	8	80	10	
Difficult to form words	No	4	28,5	10	71,5	14	0,132
	Yes	4	25	12	75	16	
Cannot speak	No	10	48	11	52	21	0,675
	Yes	4	44	5	56	9	
Perceptual disorders	No	9	39	14	61	23	0,658
	Yes	2	28,5	5	71,5	7	
Orientation disorders	No	12	43	16	57	28	0,265
	Yes	1	50	1	10	2	
Level of consciousness	Compos Mentis	10	38	16	62	26	0,367
	Somnols	1	25	3	75	4	

Table 8 above shows the relationship of early stroke management with neurological damage. Early treatment of stroke is related to the stiffness experienced by respondents with p values (0.042) < α (0.05). Early treatment of stroke is not related to numbness, visual disturbances, dizziness, confusion, balance disorders, headaches, paralysis, loss of taste, visual field disturbances, difficulty forming words, unable to speak, impaired perception, impaired orientation and level of consciousness. This is evidenced by a p value greater than 0.05.

There are several risk factors that can facilitate the occurrence of stroke, such as old age, gender (male), low birth weight, hereditary factors (*family)*, race (ethnicity), indeed cannot be avoided or changed (*non modifiable risk factor*). While other risk factors may still be avoided, treated or corrected (*modifiable risk factors*) (M. K. Indonesia, 2017).

According to (K. K. Indonesia, 2013) Early detection of acute stroke attacks is carried out using the assessment tool "Immediately to the Hospital", namely: 1) Asymmetrical smile; 2) Weakening or immobilized limbs suddenly; 3) Sounds that are improper, hoarse, or even disappear; 4) Numbness; 5) Visual impairment; and 6) Imbalance/vertigo/spinning swirl.

Stroke prevention according to (Handayani et al., 2019), what can be done at home is to: 1) Regular exercise; 2) Control blood pressure and sugar and have regular health checks; 3) Avoiding stress; 4) Quitting smoking; 5) Low in salt and fat diet, multiply vegetable and fruit foods; 6) Regular control when suffering from chronic diseases such as high blood pressure (hypertension), diabetes (Diabetes Mellitus), high cholesterol, heart disease; and 7) Take medication regularly as directed by your doctor.

CONCLUSION

Based on the results of the study, it can be concluded that the initial treatment carried out at home by the family is not related to neurological damage to stroke patients. Early treatment of stroke was only related to the stiffness experienced by respondents with p values (0.042) < α (0.05). Meanwhile, the initial treatment of stroke is not related to numbness, visual disturbances, dizziness, confusion, balance disorders, headaches,

paralysis, loss of taste, visual field disturbances, difficulty forming words, cannot speak, impaired perception, impaired orientation and level of consciousness.

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