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RESEARCH ARTICLE

Prehospital Stroke Management by Family Members among Stroke Patients in DR. Drs. M. Hatta Bukittinggi Brain Hospital, West Sumatera - Indonesia, 2024

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ABSTRACT

Stroke management delay or pre-hospital delay is still high, shown by only 18.7% of patients arriving at the hospital about three hours after onset. This study aims to identify pre-hospital stroke treatment or management carried out by family members, starting from early detection knowledge, patient delivery, and transportation. This study's population was families accompanying stroke patients treated at the DR. Drs. M. Hatta Bukittinggi Brain Hospital in Indonesia. The sample was the families who found patients during the stroke attack, totaling 146 respondents (families of stroke patients). The design of this study used a descriptive questionnaire for pre-hospital stroke treatment. The study's results showed that most families knew the signs and symptoms of stroke attacks and took the first action to deliver the patient. Most families had taken the patient to the hospital; the arrival time was mainly> 4.5 hours. Most families use cars that are not equipped with oxygen cylinders, pressure meters, and other medical equipment for transportation. The study's findings showed that most family members were aware of a stroke attack's warning signs and symptoms and immediately took the necessary response. Most families transported the patients to the hospital for the delivery dimension, and it took them more than 4.5 hours to get there. Most families drive regular vehicles without oxygen cylinders, pressure monitors, or other medical devices for mobility. Discharge planning should be put into place by officers before the patient departs from the hospital to ensure that stroke patients are handled promptly in the case of another injury or death in the family. In addition, family education needs to be improved so that the pre-hospital treatment is appropriate and there is no pre-hospital delay.

INTRODUCTION

Non-communicable diseases (NCDs) such as heart disease, stroke, cancer, chronic respiratory diseases, and diabetes are the leading causes of death in the world (Ministry of Health of Indonesia - MoH Indonesia, 2018). A stroke is a nerve function disorder caused by a disruption of blood flow to the brain, which can occur suddenly in a matter of seconds or quickly within a few hours, with symptoms or signs corresponding to the affected area. This is caused by disrupting blood vessel flow in the brain (Avula et al., 2020). Many things can stop blood flow in the brain, such as blockages in blood vessels (ischemic stroke) or rupture of blood vessels (hemorrhagic stroke), both of which can stop the blood supply to the brain and can cause the appearance of symptoms of brain tissue death (Petty et al., 2021).

Stroke is the third leading cause of death in the United States, after heart disease and cancer (Badwelan et al., 2021). With 88% of stroke deaths occurring in low- and middle-income nations,

stroke is a significant cause of disability and death globally (Wiyarta et al., 2024). The prevalence of stroke in Indonesia increases with age. Most stroke cases are diagnosed by health workers over 75 years old (43.1%), with the lowest in the 15-24 age group at 0.2%. The prevalence of stroke by gender is higher in men (7.1%) than in women (6.8%). Compared to residential areas, the prevalence of stroke is higher in urban areas (8.2%) than in rural areas (5.7%) (MoH Indonesia, 2018). Stroke can now be treated; patients who get IV thrombolytics have better results after an acute ischemic stroke. (Hacke et al., 2008; IST-3 collaborative group et al., 2012., Lees et al., 2010). Recanalizing therapies are, unfortunately, only given to a small percentage of eligible ischemic stroke patients. (Leys et al., 2007). Recent advancements in prehospital stroke care have uncovered recent discoveries into how to provide thrombolytic therapy more quickly. Additionally, they have rekindled interest in neuroprotective medications and treatments, which must be administered as quickly as possible after a stroke occurs to preserve viable brain tissue (Weber et al., 2013).

The prevalence of stroke in Indonesia is 10.9 per 1,000 population. This figure decreased from the previous five years, which was 12.1 per 1,000 people and increased compared to 2007 when it was 8.3 per 1,000 people. (Ministry of Health of the Republic of Indonesia, 2018). West Sumatra Province is in the 15th position out of 34 provinces in Indonesia. The prevalence of stroke incidence in West Sumatra Province reached 0.5% for the age group of 15-24 years, 1% for the age group of 25-34 years, 4.6% for the age group of 35-44 years, 10.2% for the age group of 45-54 years, 33.9% for the age group of 55-64 years, 43.9% for the age group of 65-74%, and the highest percentage occurred at the age of >75 years with a figure of 54.7% (MoH Indonesia, 2018). DR. Drs. M. Hatta Brain Hospital Bukittinggi is the only stroke center in West Sumatra that treats stroke patients to meet basic needs. Stroke is the most common disease in the stroke care unit room at the Brain Hospital. Based on data from the 2021 Medical Record at the Brain Hospital, Drs. M. Hatta Bukittinggi, it was found that the incidence of stroke increased from year to year. The incidence of stroke at the end of 2021 was 2735 people, and 9.14% died (Sari et al., 2019). Families, the community, or health workers can carry out initial treatment. The first people to meet patients are families. The success of handling pre-hospital conditions in families of stroke patients is greatly influenced by the level of family knowledge in detecting stroke attacks. The family can identify risk factors for stroke, the location of the event far from health services, the assistance of a life partner as a support system, previous stroke history, stroke comorbidities related to stroke severity, and economic factors in financing treatment (Kamal et al., 2021; Ministry of Health of Indonesia, 2020).

The golden period in stroke management is ± 3 hours from the beginning of the attack. Patients must immediately get comprehensive and optimal therapy from the hospital emergency team for optimal treatment results (Setianingsih et al., 2019). The high rate of prehospital delay is shown by only 18.7% of patients who arrive at the hospital less than 3 hours after onset. The same was found in other studies, where only 24.5% of patients arrived on time or within 3 hours of the stroke's onset (Prasetyo, 2018). Studies show that there is still a high rate of delay in stroke treatment in Indonesia. There is a need for immediate action to increase stroke awareness and pre-hospital protocols to provide timely and appropriate care for stroke patients (Terecoasă et al., 2022). Stroke requires immediate treatment, which is greatly influenced by proper pre-hospital early detection. Since the majority (95%) of the early symptoms of stroke occur outside the home or hospital, it is vital to be aware of stroke by recognizing stroke symptoms quickly. The optimal management is during the golden period, which is the golden period for stroke patients to get optimal help 3-6 hours after the stroke patient is first found. Medical treatment more than 12 hours after the stroke occurs risks causing more significant permanent disability (Sudarso et al., 2019).

Research Objectives

Families, the community, or health workers can carry out initial treatment. The first people to meet patients are families. A family is a basic unit of society whose members commit to caring for each other emotionally or physically. Other family members often underestimate stroke attacks in family members. They consider that the attack that occurs in one of the family members is a common cold and fatigue. The family plays a critical role in dealing with acute stroke attacks in family members (Sari et al., 2023). This study aims to find an overview of the family's ability to handle pre-hospital stroke at home, including knowledge of patient detection, management, delivery, and transportation.

METHODOLOGY

This study is quantitative research with an observational descriptive design. To obtain an overview of pre-hospital stroke management by families, including recognizing signs and symptoms as well as early detection, patient transportation, and patient transportation. The measuring tools used are a Severity Questionnaire in Stroke Patients using the NIHSS (National Institutes Of Health Stroke Scale) Instrument that has been tested for validity and a pre-hospital initial treatment questionnaire in the event of stroke by the family, which has been used by Setianingsih et al., 2019 with a reliability test of 0.953 and a validity test of 0.645-0.862 questions about three dimensions, namely early detection knowledge, patient delivery, and patient transportation.

Population and sample

This study's population is families accompanying stroke patients treated at the DR Brain Hospital. Drs. M. Hatta Bukittinggi from June to October 2024. As many as 510 patients were treated each quarter. The number of samples used for this study was 146 respondents, following the inclusion criteria using the purposeful sampling technique.

Data collection methods

1. The administrative procedure in this study is to take care of licensing to the DR Brain Hospital. Drs. M. Hata Bukitinggi
2. The technical procedure of the data collection process begins with explaining the research, and the respondent is asked to indicate his willingness to participate.
3. Observe the severity of the neurology by filling in the NIHSS table at the beginning of admission, and observations are made when the patient is allowed to go home
4. Fill out a questionnaire to the patient's family, who is directly observing, and interview the accompanying person about what was done when the attack occurred at home.

Data analysis methods

Data processing involves several steps: editing, coding, processing, and cleaning. For univariate data, patient knowledge, management, delivery, and transportation were analyzed using frequency scoring. The characteristics of the respondents were analyzed by assessing the frequency distribution.

Research Ethics

The ethics committee of Bukittinggi Brain Hospital, West Sumatra, has approved this research. No:001212/KEP. RSOMH Bukittinggi/2024, May 8, 2024. The proposed research protocol is based on 7 (seven) WHO Standards and Guidelines 2011, regarding the CIOMS Guidelines 2016. This ethical feasibility is valid for one year, practical from the date of issuance, and the proposal for extension is resubmitted if the research cannot be completed within the validity period of the ethical feasibility letter.

RESULTS

Respondent Characteristics

Respondent characteristics showed that more than half (51.4%) of the respondents were female, more than half (54.1%) of the respondents were elderly, some (50%) of the respondents had secondary education, almost some (47.2%) of the respondents did not work, and that most (70.5%) of the respondents said that the patient had been suffering from hypertension for < 5 years. Most (68.5%) patients with BMI are in the normal category. More than a part (54.1%) of patients are in the elderly category. More than some (60.3%) of the respondents took the patient to the hospital for> 4.5 hours, and almost all (98.6) and most (89.7%) of the respondents took the patient to the hospital by private vehicle. The characteristics of the respondents consist of age, gender, education, and occupation, which can be seen in the table below:

Table 1. Frequency Distribution of Respondent Characteristics

Respondent Characteristics	Category	F	%
Gender	Male	71	48.6
	Female	75	51.4
Age	Early adulthood	2	1.4
	Late adulthood	65	44.5
	Elderly	79	54.1
Education	Primary education	10	6.8
	Secondary education	73	50.0
	Higher education	63	43.2
Occupation	Self-employed	55	37.7
	Private employees	15	10.3
	Civil servants	7	4.8
	Not working	69	47.2
Time suffering from hypertension	< 5 Years	103	70,5
	>5 Years	43	29.5
IMT	Thin	3	2.1
	Normal	100	68.5
	Obese	26	17.8
	Overweight	17	11.6
Time to be taken to the hospital	>4.5 hours	88	60,3
	< 4.5 hours	39	26.7
	>1 week	19	13
Transportation used	Ambulance	14	9,6
	Private vehicle	131	89.7
	Public transportation	1	0.7

Table 1 above shows that more than half (51.4%) of the respondents are female, more than half (54.1%) are elderly, some (50%) have a secondary education, and almost half (47.2%) do not work (jobless). Most (70.5%) respondents said patients had long-term hypertension < 5 years. Most (68.5%) patients with BMI are in the normal category. More than a part (54.1%) of patients are in the elderly category. That more than half (60.3%) of the respondents took the patient to the hospital for more than 4.5 hours, almost all (98.6%) of the patients did not receive rTPA therapy, and most (89.7%) of the respondents took the patient to the hospital by private vehicle.

Tabel 2. Penanganan Pre Hospital Stroke oleh keluarga

Management	Family Efforts	
	Yes	No
Early detection knowledge		
Do you ask if there is numbness in the legs or hands?	134 (91.8%)	12 (8.2%)
Do you observe the presence of a curved face?	70 (47.9%)	76 (52.1%)
Do you observe any speech difficulties or slurs?	111 (76.0%)	35 (24.0%)
Do you expect paralysis in his arms?	143 (97.9%)	3 (2.1%)
Do you ask about weakness in the legs?	143 (97.6%)	3 (2.1%)
Do you ask for a sudden headache accompanied by vomiting, dizziness, or a change in consciousness?	51 (34.9%)	95 (65.1%)
Action		
Did you not pick it up immediately?	76 (52.1%)	70 (47.9%)
Do you immediately lay it down with your head higher?	35 (24.0%)	111 (76.0%)
Do you call other family members right away?	133 (91.1%)	13 (8.9%)

The table above shows that in the knowledge dimension, less than a part (47.9%) of respondents observed a curved face when the attack came. More than half (65.1%) of respondents did not ask about sudden headaches. More than a majority (52.1%) of respondents did not immediately pick up

the patient when the attack came. Most (76%) respondents immediately laid it down with their heads higher during the attack. Almost all (91.1%) of respondents immediately called another family member when they met a person who had suffered a stroke.

Table 3. Referral of Stroke patients by family

Delivery	**Family Efforts**	
	Yes	**No**
Delivery Principle		
Do you call an ambulance immediately?	14 (9.6%)	132 (90.4%)
Do you send them to the hospital 3 hours after the incident?	55 (37.7%)	91 (62.3%)
Do you think that taking a stroke patient to the intended hospital is the right course of action?	65 (44.5%)	81 (55.5%)
Do you think that if a patient has a stroke, then taking them to the doctor/midwife is the right course of action?	89 (61.0%)	57 (39.0%)
Do you think that when referring a patient with a stroke, you should use an ambulance?	20 (13.7%)	126 (86.3%)
Do you think sending patients to the hospital does not require an ambulance?	105 (71.9%)	41 (28.1%)

In the dimension of patient delivery, almost all (90.4%) of the families did not immediately call an ambulance when they met a family member who was experiencing a stroke, and more than some (62.3%) of the family sent the patient to the hospital after 3 hours from the incident. More partial. (61%) respondents have thought that after a stroke attack, they must be taken to health workers, and most (71.9%) respondents have thought that sending patients must use ambulances.

Table 4. Transport of Stroke patients by family

Transportation	**Family Efforts**	
	Yes	No
Transportation		
Do you use a regular car to take your family to the Hospital?	130 (89.0%)	16 (11.0%)
Is there an emergency ambulance officer in the car you use to take your family to the hospital?	14 (9.6 %)	132 (90.4%)
Is the driver of the car you use to take your family to the hospital an ambulance driver?	13 (8.9%)	133 (91.1%)
Is there oxygen, a tonometer, and other medical equipment in the car you use to take your family to the hospital?	13 (8.9%)	133 (91.1%)
Does the car you use to take your family to the hospital have a siren turned on to speed up the process of transporting patients to the hospital?	14 (9.6%)	132 (90.4%)

The table above shows that most (89%) respondents referred patients with ordinary cars, almost all (91.1%) respondents referred patients with ordinary cars, and they did not have oxygen, sphygmomanometers, or other medical equipment.

DISCUSSION

Family knowledge about risk factors and early symptoms of stroke Family knowledge in detecting signs and symptoms of stroke. The success of handling stroke patients is greatly influenced by the level of family knowledge in detecting stroke attacks (Maratning et al., 2021). According to (Ishariani & Rachmania, 2021). The faster the family's response time in bringing stroke patients to health services, the milder the severity of the stroke. Pre-hospital management is the initial actions or treatment that can be given to stroke patients while still at home and before being referred to the hospital. Families, the community, or health workers can carry out initial treatment. Family is the first community to meet patients (Andrianur & Ismansyah, 2021). A family is the basic unit of society where its members commit to caring for each other emotionally and physically. Other family members often underestimate stroke attacks in family members. They consider that the attack that

occurs in one of the family members is a common cold and fatigue. The family plays a vital role in dealing with acute stroke attacks on family members. (Andrianur & Ismansyah, 2021; Asmaria & Yuderna 2020).

Regarding patient delivery, most (89.0%) families who send patients to hospitals do not use ambulances. Almost all (90.4%) can be seen most (91.1%) there is no emergency ambulance officer in the car used to take your family to the hospital. Almost all (91.1%) refer patients without oxygen, sphygmomanometers, or other medical equipment. Long transportation affects the time for treatment and recovery goals of stroke patients (Setianingsih et al., 2019). The faster stroke patients are taken to the hospital, the more successful the treatment will be (Wijayanti et al., 2023). The first three hours after a suspected stroke is very important and decisive for the patient. This can be realized if the family also knows the importance of patients suspected of having a stroke immediately being taken to an adequate health facility (Andrianur & Ismansyah, 2021). Encourage the role of the family in the early handling of stroke events so that the family can help overcome the problem and reduce the delay in helping in the early phase. Thus, these efforts are expected to help increase awareness and quick action by families in bringing stroke patients to the hospital so that stroke treatment can be carried out more effectively (Trisniawati, 2022).

According to the study results, the relevant agencies do not have details for the existing ambulance data under the 2001 Standardization of Medical Service Vehicles of the Ministry of Health-Social Affairs. The majority of this research is that the majority of patients are not under the management guidelines for carrying stroke patients. This can happen because of the informant's ignorance that, ideally, the means of transportation used to transport stroke patients is an ambulance. There can also be other reasons, for example, practicality, because the mode of transportation around the patient's location when affected by a stroke is the mode of transportation (DiBiasio et al., 2020). After the onset of symptoms, an initial call for help, and the arrival of Emergency Medical Services (EMS), the EMS team assesses the patient. This assessment becomes the basis for triage decisions and determines whether the patient is directed to the nearest primary stroke center (PSC), capable of intravenous (IV) thrombolysis (Ospel et al., 2023). The low use of ambulances in emergency cases to transport sick patients is in line with the results of research in China, which says the use of ambulances is low in cases of acute coronary syndrome. This is undoubtedly a call for the public to understand better that using ambulances can help patients taken to hospitals in emergencies. Other research also shows that using an ambulance to transport stroke patients will shorten the time interval compared to not using an ambulance (Vogel et al., 2024). The ambulance is equipped with sirens and rotator lights that signal other road users so that it will make it easier to travel. Ambulances are also vehicles that are prioritized or prioritized on the road. With the appropriate mode of transportation, the first treatment for stroke patients is faster. Standardization of transportation and protocols for acute care is needed to improve efficiency and overall care for stroke patients. In addition, the need to train ambulance personnel and emergency departments on stroke remains indispensable (Zachrison et al., 2023).

CONCLUSION

The results of the study showed that most of the family had known the signs and symptoms of a stroke attack and carried out the first action that had to be taken. In the delivery dimension, most families had taken the patient to the hospital, and the time to arrive mainly was > 4.5 hours. Most families use ordinary cars not equipped with oxygen cylinders, pressure meters, and other medical equipment for transportation dimensions. Healthcare professionals should implement discharge planning before the patient leaves the hospital so that there is no delay in handling stroke patients in the event of the following injury or other family members.

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CONFLICT OF INTEREST

The authors declare they have no conflict of interest.

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