



Factors Related to the Incidence of Ischemic Stroke in the Elderly

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DOI: <https://doi.org/10.56359/gj.v8i1.1100>



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ABSTRACT

Introduction: World Health Organization (WHO) data for 2022 states that there are 12,224,551 new cases each year. The prevalence of stroke in Indonesia in 2023 is 23.1 million people (8.3%) of a population of 277.5 million. Data from Bakti Timah Hospital, Pangkalpinang, states that there were 318 cases of stroke in 2024.

Objective: The purpose of this study was to determine the factors associated with the incidence of ischemic stroke in the elderly at Bakti Timah Hospital, Pangkalpinang, in 2025

Method : The design in this study used a cross-sectional with independent variables (history of disease, diet and family support) and dependent variables (ischemic stroke in the elderly). The population size in this study was 318 people and a sample of 83 people, the calculation used simple random sampling. The research time was from 16 to June 2025

Result: The results of the study obtained a p-value of the knowledge variable 0.000 <0.05, diet 0.000 <0.05 and physical activity 0.000 <0.05. This shows that there is a significant relationship between medical history, diet and family support on the incidence of ischemic stroke in the elderly at Bakti Timah Hospital Pangkalpinang in 2025

Conclusion: Suggestions in this study are expected to be used as evaluation material that it is important to maintain a healthy diet, support and encouragement of motivation from the family so that the elderly are enthusiastic and motivated in dealing with their illness. This should be a greater concern for health institutions, especially in designing work programs with a wider reach, such as providing health education and counseling to the community.

Keywords: Diet, Family Support, History Of Disease, Ischemic Stroke In The Elderly

Introduction

Stroke is a neurological disease or nervous system disorder that occurs rapidly and suddenly due to impaired blood flow to the brain. This impaired blood flow is divided into two types: blockage in a blood vessel or rupture. This obstructed blood flow results in the loss of brain function due to the interruption of blood supply to that part of the brain. A stroke occurs when a blood vessel in the brain becomes blocked or ruptures, depriving part of the brain of the necessary oxygen-carrying blood supply, leading to cell/tissue death. Ischemic stroke occurs when blood flow to the brain is reduced or stopped, depriving the brain of oxygen and nutrients. This results in brain tissue death (Ministry of Health of the Republic of Indonesia, 2019).

According to 2022 data from the World Health Organization (WHO), there are 12,224,551 new cases annually, and 101,474,558 individuals currently alive have experienced a stroke. The number of deaths due to stroke is 6,552,724, and 143,232,184 individuals experience disabilities due to stroke. In 2018, 15 million people suffered strokes worldwide each year. Of these, 5 million died and another 5 million were permanently disabled. According to World Health Organization data, stroke prevalence rates indicate that each year there are 13.7 million new cases of stroke, and approximately 5.5 million deaths due to stroke. Approximately 70% of strokes and 87% of deaths and disabilities due to stroke occur in low- and middle-income countries. Over the past 15 years, strokes have occurred and caused more deaths in low- and middle-income countries than in high-income countries (Mutiarasari, 2019). The prevalence of stroke in Indonesia has increased, reaching 17.7 million (7%) out of a population of 253.3 million in 2013. This figure increased to 29.3 million (10.9%) out of a population of 267.1 million in 2018 and to 23.1 million (8.3%) out of a population of 277.5 million in 2023 (Ministry of Health, 2024).

According to data from the Bangka Belitung Provincial Health Office, the number of stroke cases in 2021 was 4,929, with an increase of 5,078 cases in 2022. Meanwhile, in 2023, stroke cases reached 3,451, making it one of the 10 most common diseases in Bangka Belitung Province (Bangka Belitung Provincial Health Office, 2023).

According to data from Bakti Timah Hospital in Pangkalpinang, there were 237 stroke cases in 2022, with an increase of 287 in 2023 and 318 in 2024 (Bakti Timah Hospital Medical Records, Pangkalpinang, 2024).

Stroke patients typically experience sudden facial weakness, confusion, difficulty speaking or understanding what is being said, headaches, nausea, sudden vomiting, and sudden numbness or tingling in the affected area. In addition to these complaints, stroke patients also experience impaired physical mobility. 70-80% of patients experience hemiparesis (muscle weakness on one side of the body), with 20% experiencing improvements in motor function. Approximately 50% experience symptoms that may include impaired motor function/muscle weakness in both the upper and lower extremities if they do not receive appropriate treatment options through nursing interventions and post-stroke rehabilitation (Hammond & Zimmermann, 2018).

Risk factors for ischemic stroke can be divided into two: modifiable and non-modifiable. Modifiable risk factors include hypertension, diabetes mellitus, dyslipidemia, dietary habits, family support, lack of physical activity, unhealthy diet, and stress. Non-modifiable risk factors include family history, age, and gender (Ministry of Health, 2019).

Research conducted by Naibaho (2022) stated that of the 70 respondents in Pematang Panjang Village, 21.4% of the elderly had very good eating habits, 28.5% of the elderly had good eating habits, 14.2% of the elderly had sufficient/moderate eating habits, 21.4% of the elderly had poor eating habits, and 14.2% of the elderly had very poor eating habits. Based on the respondents' eating patterns, the foods that are not recommended for stroke sufferers that are still often consumed are coconut oil, a high-fat food ingredient and have an effect on increasing cholesterol in the blood. Stroke respondents are advised to regulate their diet to avoid foods that contain high levels of fat and cholesterol (offal, etc.).

Based on the results of an initial survey conducted on March 3, 2025 at Bakti Timah Hospital, Pangkalpinang, it was shown that out of 10 elderly people who experienced ischemic stroke, there were 7 people (70%) who had poor eating habits such as eating high-fat, sugary foods and cholesterol, and 8 people (80%) had no motivation from their families to deal with ischemic stroke, which affected the patient's recovery rate, and 6 people (60%) had a history of diseases such as hypertension, diabetes mellitus and heart disease which trigger and increase the risk of ischemic stroke in the elderly.

Objective

The purpose of this study was to determine the factors associated with the incidence of ischemic stroke in the elderly at Bakti Timah Hospital, Pangkalpinang, in 2025

Method

The design in this study used a cross-sectional with independent variables (history of disease, diet and family support) and dependent variables (ischemic stroke in the elderly). The population size in this study was 318 people and a sample of 83 people, the calculation used simple random sampling. The research time was from 16 to June 2025.

Results

Frequency Distribution of Respondents Based on Medical History
At Bakti Timah Hospital, Pangkalpinang 2025

Medical History	Frequency	Percentage (%)
History of Hypertension, Diabetes Mellitus, Heart	50	60,2
No history of Hypertension, Diabetes Mellitus, Heart	33	39,8
Total	83	100

Respondents who had a history of hypertension, diabetes mellitus and heart disease were 50 people (60.2%) more than respondents who did not have a history of hypertension, diabetes mellitus and heart disease.

Frequency Distribution of Respondents Based on Diet At Bakti Timah Hospital, Pangkalpinang 2025

Dietary Pattern	Frequency	Percentage (%)
Healthy	38	45,8
Unhealthy	45	54,2
Total	83	100

There were 45 respondents (54.2%) who had unhealthy eating patterns, more than the respondents who had healthy eating patterns.

The Relationship Between Medical History and Ischemic Stroke in the Elderly at Bakti Timah Hospital, Pangkalpinang 2025

Medical History	Stroke				Total		<i>p-value</i>	POR (CI 95%)
	Iskemic Stroke		Hemoragic Stroke					
	n	%	n	%	n	%		
History of Hypertension, Diabetes Mellitus, Heart	44	91,7	6	17,1	50	60,2	0,000	53,167 (13,794- 204,925)
No history of Hypertension, Diabetes Mellitus, Heart	4	8,3	29	82,9	33	39,8		
Total	48	100	35	100	83	100		

Ischemic stroke in the elderly was more common in respondents with a history of hypertension, diabetes mellitus, or heart disease (44 people (91.7%)), compared to respondents without a history of hypertension, diabetes mellitus, or heart disease (4 people (8.3%)). Hemorrhagic stroke in the elderly was more common in respondents without a history of hypertension, diabetes mellitus, or heart disease (29 people (82.9%)), compared to respondents with a history of hypertension, diabetes mellitus, or heart disease (6 people (17.1%)). The Chi-Square Test significance value was $0.000 < 0.05$. This indicates a significant association between medical history and ischemic stroke in the elderly. The POR (95% CI) value was 53.167 (13.794-204.925), meaning respondents with a history of hypertension, diabetes mellitus, or heart disease were 53.167 times more likely to experience ischemic stroke.

Discussion

A medical history is a comprehensive record of a person's past and current health conditions. This record includes information about past illnesses, allergies, medications, immunization history, previous surgeries, and family health history. Medical history plays a significant role in determining the risk of ischemic stroke in the elderly. Risk factors for ischemic stroke can be divided into two categories: modifiable and non-modifiable. Modifiable risk factors include hypertension, diabetes mellitus, dyslipidemia, physical inactivity, an unhealthy diet, and stress. Non-modifiable risk factors include family history, age, and gender. Three risk factors significantly influence the incidence of ischemic stroke in patients: hypertension, diabetes mellitus, and a history of heart disease.

The study results showed that ischemic stroke in the elderly was more common in respondents with a history of hypertension, diabetes mellitus, or heart disease (44 people (91.7%)), compared to respondents without a history of hypertension, diabetes mellitus, or heart disease (4 people (8.3%)). Hemorrhagic stroke in the elderly was more common in respondents without a history of hypertension, diabetes mellitus, or heart disease (29 people (82.9%)), compared to respondents with a history of hypertension, diabetes mellitus, or heart disease (6 people (17.1%)). Research conducted on 83 respondents showed a significant association between medical history and the incidence of ischemic stroke in the elderly at Bakti Timah Hospital, with a Chi-Square test value of $0.000 < 0.05$. The POR value (95% CI) =

53.167 (13.794-204.925), which means that respondents with a history of hypertension, diabetes mellitus, and heart disease had a 53.167 times greater risk of experiencing ischemic stroke. This study aligns with research conducted by Hisni et al. (2022) which stated that there is a relationship between hypertension and the incidence of ischemic stroke ($p = 0.000$), there is a relationship between diabetes mellitus and the incidence of ischemic stroke ($p = 0.000$), and there is a relationship between a history of heart disease and the incidence of ischemic stroke ($p = 0.003$). There are three risk factor variables that influence the incidence of ischemic stroke. Hypertension can cause blood vessels to narrow, leak, rupture, or become blocked. This can disrupt blood flow that carries oxygen and nutrients to the brain. If this happens, brain cells and tissue will die and cause a stroke. Stroke patients who have a history of hypertension because someone does not maintain a healthy lifestyle such as rarely exercising and doing physical activity, consuming too much salt, frequent stress, lazy movement, being overweight or obese, smoking habits, and excessive alcohol consumption. Diabetes mellitus causes the rate of cell aging to occur very quickly due to high glucose levels accompanied by fragility of blood vessels, so that a high risk of hypertension and heart disease which ultimately increases the risk of stroke. This occurs because elevated blood sugar can increase the risk of atherosclerosis and other stroke risks, such as hypertension, obesity, and hyperlipidemia. A history of heart disease is a risk factor for stroke. This heart disease is caused by narrowing of the blood vessels in the heart. Some risk factors include an unhealthy lifestyle, such as a diet high in carbohydrates or fat, obesity, lack of physical activity, and smoking.

Likewise, research conducted by Indriasari et al (2023) stated that there is a relationship between type 2 diabetes mellitus and ischemic stroke in Neurology polyclinic patients at RSBK Batam in 2021. The results of 60 ischemic stroke patients showed 45 patients suffering from type 2 diabetes mellitus, while of 60 patients without ischemic stroke, there were 26 patients suffering from type 2 diabetes mellitus. The results of the chi-square test showed a relationship between type 2 diabetes mellitus and ischemic stroke with a p value of $0.000 < 0.05$. Individuals with diabetes develop dyslipidemia characterized by small dense low-density lipoproteins, reduced high-density lipoproteins and increased triacylglycerol levels, as well as accelerated atherogenesis. Metabolic disorders, such as insulin resistance, compensatory hyperinsulinemia, inflammation, hyperlipidemia, and hyperglycemia, can also cause cerebrovascular events in people with type 2 diabetes. The negative association between type 2 diabetes and hemorrhagic stroke may reflect endothelial proliferation and basement membrane thickening in cerebral blood vessels induced by type 2 diabetes, which leads to an increased risk of infarction but not rupture.

Researchers believe that medical history plays a significant role in the occurrence of ischemic stroke in the elderly. A history of diseases such as hypertension, diabetes mellitus, and heart disease are risk factors for ischemic stroke in the elderly. Screening the elderly to identify risk factors for ischemic stroke is necessary. Appropriate treatment of pre-existing conditions such as hypertension, diabetes mellitus, and heart disease will reduce the risk of ischemic stroke in the elderly.

Conclusion

This study found a significant association between medical history and the incidence of ischemic stroke among older adults at Bakti Timah Hospital, Pangkalpinang. A significant association was also identified between dietary patterns and the incidence of ischemic

stroke. In addition, family support was significantly associated with the incidence of ischemic stroke among older adults. These findings indicate that medical history, dietary patterns, and family support are important factors associated with the occurrence of ischemic stroke in this population..

Funding

This research was conducted with personal funding, it is not a grant or any external party involved.

Acknowledgement

Researcher would like to thanks to my parents, supervisor, friends, and all parties involved in compiling this research

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