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Research Article

Factors Influencing Stroke Occurrence in Outpatient Patients in Bekasi District Hospital

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Abstract

Aims: According to medical record data obtained from the Bekasi Regency Hospital, the number of stroke patients has increased in the last three years, with 1,721 people (1.52%) of the total number of patients as many as 112,925 people in 2016, 2,060 people (1.82%) out of a total of 113,240 patients in 2017, and 2,875 people (2.53%) out of a total of 113,728 patients in 2018. These statistics show that the incidence of stroke is increasing year after year.
Methods : Analytic with a cross-sectional approach is used in the research procedure. All stroke patients who completed outpatient examinations at the Bekasi District Hospital in December 2018 were included in this study, with a total sample size of 103 persons (Systematic Random Sampling). Univariate and bivariate analysis with the chi square test are utilized as analytical methods.
Result : The occurrence of stroke is a risk factor because the function of cells, tissues, and organs decreases with age as a natural process of aging. Influence is a common source of behavior problems in children and young people. The majority of stroke patients in this study were above the age of 55, accounting for 42.7% of all stroke patients. Estrogen plays a role in boosting HDL levels. With a vascular illness mechanism, hypertension frequently produces abnormalities in the function and structure of a person's brain.
Conclusion: Each of the four variables has an effect on the occurrence of stroke. With a p value of 0.05, this indicates that age, gender, history of hypertension, and history of diabetes all have an impact on the incidence of stroke.

Keywords:
Stroke, nerve function, bleeding, outpatient, history

INTRODUCTION

Stroke is a condition of nerve function and bleeding that starts abruptly, rapidly, and worsens in the blood arteries of the brain. This results in symptoms such as facial and limb paralysis, slurred speech, visual abnormalities, and so on (1). According to World Health Organization (WHO) figures from 2015, stroke is the second biggest cause of death after heart disease, accounting for 6.24 million individuals or 11.3% of all fatalities. The remaining 46.66% had ischemic strokes, and 53.34% suffered hemorrhagic strokes (WHO, 2016). Stroke is also a global epidemic that endangers people's lives, health, and quality of life. Stroke is a huge public health issue because it causes so much illness, disability, and mortality. Every year, stroke kills 6.5 million people worldwide and is estimated to kill 7.8 million people by 2030 (2).

The annual death rate from stroke in the United States is between 50 and 100 per 100,000 people, as reported by the American Heart Association (AHA). Eighty percent of all strokes occur in developing and

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disadvantaged nations, according to the World Health Organization (2016). Stroke is a leading cause of death throughout the ASEAN region. Indonesia has the highest stroke death rate, followed by the Philippines, Singapore, Brunei, Malaysia, and Thailand, according to data from the South East Asian Medical Information Center (SEAMIC). Ischemic stroke accounts for 52.9% of all stroke cases in Indonesia, followed by intracerebral hemorrhage (38.5%), embolism (7.2%), and subarachnoid hemorrhage (1.4%) (3).

Stroke prevalence increased from 7% in 2013 to 10.9% in 2018, according to data from the Indonesian Ministry of Health's 2018 Basic Health Research (Riskesdas). The average age of a stroke victim is 45 years old. Stroke rates were highest in people aged 75 and up (67% higher). Stroke is the leading cause of mortality in Indonesia, responsible for an estimated 15.4% of deaths across the country's hospitals. With a rate of 14.7% per million, East Kalimantan Province has the highest rate of stroke cases identified by medical professionals. With a prevalence of 14.6%, Yogyakarta trails only North Sulawesi (14.3%) and West Java (10.9%). Stroke was the fifth leading cause of death in Bekasi Regency in 2016, with 43% of victims being female and 37% male (Central Bureau of Statistics, 2017). An unhealthy lifestyle, including poor dietary choices that constrict cerebral blood arteries, chronic stress, and inactivity, are major risk factors for stroke. To get around, especially in metropolitan settings, people rely heavily on cars rather than on foot (4). Stroke can be either ischemic (caused by a decrease in blood flow as a result of a clot or embolus) or hemorrhagic (caused by hemorrhage) (5). A hemorrhagic stroke occurs when a blood artery in the brain bursts, releasing blood into the surrounding brain parenchyma tissue, the cerebrospinal space, or both (6).

Stroke risk factors can be broken down into two categories: those that cannot be changed, such as genetics, congenital defects, age, gender, and family history of disease; and those that can be changed, such as blood pressure, cholesterol, uric acid, heart disease, obesity, smoking, alcohol use, insufficient exercise, stress, drugs, and hormonal contraception (7). Studying stroke patients at Indramayu Hospital, (8) found a significant relationship between hypertension (p = 0.035) and physical activity (p = 0.011), but no significant relationship between age, diabetes mellitus, heart disease, blood cholesterol levels, obesity, or smoking (p > 0.05). At the same time, (9) discovered that hypertension affected 73.3% of patients at the Rejosaridi Pekanbaru Health Center, diabetes affected 43.3%, and high cholesterol affected 66.7%. Diabetes (p=0.027), smoking (p=0.025), lack of exercise (p=0.004), and advanced age (p=0.002) were all shown to be significantly associated with the occurrence of stroke in a study conducted in 2017 by Kaparang Research at Dr. Sam Ratulangi Tondano. According to statistical analyses, family history of disease was the most significant risk factor for stroke among non-modifiable risk factors (p = 0.016; OR = 3.281), according to research conducted by (10) at Banjarbaru Hospital. Total cholesterol had an OR of 5.638 (p 0.0001), hypertension had an OR of 5.392 (p 0.001), and LDL had an OR of 8.000 (p 0.002).

According to medical record data obtained from the Bekasi Regency Hospital, the number of stroke patients has increased in the last three years, with 1,721 people (1.52%) of the total number of patients as many as 112,925 people in 2016, 2,060 people (1.82%) out of a total of 113,240 patients in 2017, and 2,875 people (2.53%) out of a total of 113,728 patients in 2018. Because these data show that the incidence of stroke is increasing year after year, the researchers are interested in undertaking a study named "Factors Influencing the Incidence of Stroke in Outpatients at the Bekasi Regency Hospital in 2018."

METHODS

The study adopted a cross-sectional analytic strategy. Secondary sources, such as patient

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medical records, were mined for information. Medical records were the primary source of information. A total of 103 persons were selected at random from the population of stroke patients who were outpatients at Bekasi Regency Hospital in December 2018. Univariate analysis and bivariate analysis using the chi-square test are employed as the analytic techniques.

RESULTS

This research was carried out at the Bekasi District Hospital in 2018. The time of the research was carried out in January 2019. After conducting the research, data were obtained for 103 respondents.

Table 1. Distribution of the Frequency of Stroke Events in Bekasi District Hospital in 2018 n = 103

Stroke Incident	F	%
Hemorrhage	29	28.2
ischemic	74	71.8
Total	**103**	**100.0**

Table 1 can be seen that of the 103 respondents, the majority of respondents with ischemic stroke were 74 respondents (71.8%) and respondents with hemorrhagic stroke were 29 respondents (28.2%).

Table 2. Effect of Age on Stroke Incidence in Bekasi District Hospital n = 103

Age	Stroke Incident				Total		*P. Value*
	Hemorrhage		Ischemic				
	F	%	F	%	F	%	
old age	1	5,0	19	95,0	20	100,0	
Late old age	2	7,7	24	92,3	26	100,0	
Early old age	20	45,5	24	54,5	44	100,0	
Late adulthood	4	44,4	5	55,6	9	100,0	**0,001**
Early adulthood	2	50,0	2	50,0	4	100,0	
Total	**29**	**28,2**	**74**	**71,8**	**103**	**100,0**	

According to Table 2, the majority of respondents with ischemic stroke were 19 respondents (95.0%) of the 20 respondents who were elderly, of the 26 respondents who were late elderly, most of the respondents with ischemic stroke were 24 respondents (92.3%), of the 44 respondents who were early elderly, most of the respondents with ischemic stroke were 24 respondents (54.5%), and of the 9 respondents who were late adults, most of the respondents with ischemic stroke wer The number of hemorrhagic and ischemic strokes among the four early adult respondents was the same, namely two (50.0%). The Chi-Square statistical test yielded a value of p.0.001 (p.value 0.05), indicating that there is a relationship between age and the incidence of stroke.

Table 3. Effect of Gender on Stroke Incidence in Bekasi District Hospital n = 103

Gender	Stroke Incident				Total		*P. Value*	*Odds Ratio*
	Hemorrhage		Ischemic					
	F	%	F	%	F	%		
Man	13	18,8	56	81,2	69	100,0		
Woman	16	47,1	18	52,9	34	100,0	**0,006**	**0,261**
Total	**29**	**28,2**	**74**	**71,8**	**103**	**100,0**		

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According to Table 3, the majority of respondents with ischemic stroke were 56 respondents (81.2%) of the 69 male respondents, whereas the majority of respondents with ischemic stroke were 18 respondents (52,9%) of the 34 female respondents. The Chi-Square statistical test yielded a value of p.0.006 (p.value 0.05), indicating that there is an association between gender and the incidence of stroke. The study revealed that OR = 0.261, indicating that male respondents had a 0.261 higher likelihood of having a stroke than female respondents.

Table 4. The effect of a history of hypertension on the incidence of stroke at the Bekasi Regency Hospital n = 103

History of Hypertension	Stroke Incident				Total		*P. Value*	*Odds Ratio*
	Hemorrhage		Ischemic					
	F	%	F	%	F	%		
Yes	20	22,5	69	77,5	89	100,0		
No	9	64,3	5	35,7	14	100,0	**0,004**	**0,161**
Total	**29**	**28,2**	**74**	**71,8**	**103**	**100,0**		

According to Table 4, the majority of respondents with ischemic stroke were 69 (77.5%) of the 89 respondents with a history of hypertension, while the majority of respondents with hemorrhagic stroke were 9 (64, 3%) of the 14 respondents without a history of hypertension. The Chi-Square statistical test yielded a value of p.0.004 (p.value 0.05), indicating that there is an association between a history of hypertension and the incidence of stroke. The study revealed that OR = 0.161, indicating that respondents with a history of hypertension had a 0.161 likelihood of having a stroke compared to respondents without a history of hypertension.

.Table 5. Effect of a History of Diabetes Mellitus on the Incidence of Stroke at the Bekasi District Hospital n = 103

History of Diabetes Mellitus	Stroke Incident				Total		*P. Value*	*Odds Ratio*
	Hemorrhage		Ischemic					
	F	%	F	%	F	%		
Yes	28	35,9	50	64,1	78	100,0		
No	1	4,0	24	96,0	25	100,0	**0,002**	**13,440**
Total	**29**	**28,2**	**74**	**71,8**	**103**	**100,0**		

According to Table 5, the majority of respondents with ischemic stroke were 50 (64.1%) of the 78 respondents who had a history of diabetes mellitus, and the majority of respondents with ischemic stroke were 24 (96.0%) of the 25 respondents who did not have a history of diabetes mellitus. The Chi-Square statistical test yielded a value of p.0.002 (p.value 0.05), indicating that there is an association between the history of diabetes mellitus and the incidence of stroke. The study revealed an OR = 13.440, implying that respondents with a history of diabetes mellitus had a 13.440 likelihood of having a stroke compared to those without a history of diabetes mellitus.

DISCUSSION

Effect of Age on Stroke Incidence in Bekasi District Hospital

The results showed that the Chi-Square statistical test obtained a value of p.0.001 (p.value <0.05), which means that there is an influence between age and the incidence of stroke. The results of this study are in

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accordance with (11) who said that in general strokes are more common in elderly people (over 55 years) than in children and young adults. Increasing age tends to increase blood pressure. The risk will increase with age due to body conditions that are no longer completely normal and lifestyle changes. In addition, almost everyone over the age of 40 has atherosclerosis. Even though older people have greater risk factors, it does not rule out the possibility of stroke in children and young adults. The most common cause in children and young adults is bleeding. In addition to bleeding, there are also many children who experience cerebral infarction. The cerebral infarction will usually result in the child experiencing disability. The results of this study are also in line with the results of (12) said that there was an influence between age (p=0.002) and the incidence of stroke. In this study, it was found that there was an influence between age and the incidence of stroke. The proportion of stroke patients in this study was mostly aged over 55 years, amounting to 42.7% of all stroke patients. Age is a risk factor for stroke because with increasing age there is a decrease in the function of cells, tissues and organs as a physiological process of aging. In the case of stroke, aging results in a decrease in the elasticity of blood vessels which increases the possibility of atherosclerosis as a cause of stroke. Whereas stroke in young people is due to lifestyle changes such as consuming ready-to-eat foods that contain high levels of fat, smoking, alcohol consumption, lack of exercise, overwork and stress, use of amphetamines, history of hypertension, DM and hypercholesterolemia.

Effect of Gender on Stroke Incidence in Bekasi District Hospital

The results showed that the Chi-Square statistical test obtained a value of p.0.006 (p.value <0.05), which means that there is an influence between gender and the incidence of stroke. The results of the analysis showed that OR = 0.261, meaning that male respondents had a 0.261 chance of having a stroke compared to female respondents. Men have a greater tendency to have a stroke in early adulthood compared to women with a ratio of 2:1. The incidence of stroke is higher in men than women with an average of 25% -30%. Risk factors based on gender have slight differences. The risk of stroke in men is higher, but the death rate due to stroke is more common in women. Ischemic stroke also increases with age and is approximately 30% more common in men. In women, many strokes occur due to pregnancy, use of birth control pills, migraines, and saccular aneurysms. Purnomo's (13) at Klaten Hospital showed that the majority of respondents had ischemic stroke as much as 58.9% and showed that there was an influence between gender (p. 0.02) and the incidence of stroke, this is in accordance with the results of the study. In this study, it was found that there was an influence between gender and the incidence of stroke, this is because in this study the majority of respondents were male, elderly, had a history of hypertension and had a history of diabetes mellitus. Men tend to have a stroke higher than women. The incidence of stroke in women is lower than in men, due to the presence of the hormone estrogen which functions as a protection against the process of atherosclerosis. As it is known that the hormone estrogen has a role in increasing HDL levels. High HDL levels are an important factor in protecting against atherosclerosis. The characteristics of stroke survivors in this study are in accordance with various theories which report that more stroke survivors are found in males than females as are the characteristics of stroke survivors in Indonesia (14).

Effect of History of Hypertension on Stroke Incidence in Bekasi District Hospital

The results showed that the Chi-Square statistical test obtained a value of p.0.004 (p.value <0.05), which means that there is an influence between history of hypertension

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and the incidence of stroke. The results of the analysis showed that OR = 0.161, meaning that respondents who had a history of hypertension had a 0.161 chance of having a stroke compared to respondents who did not have a history of hypertension. Hypertension often causes disturbances in the function and structure of a person's brain with a mechanism of vascular disorders. Stroke due to hypertension is usually caused by pathological changes in the cerebral blood vessels in the brain tissue. In addition, hypertension also results in impaired ability to autoregulate brain blood vessels where blood flow to the brain will be smaller than someone who has normal blood pressur). The results of this study are in line with the results of Purnomo's (13) at RSI Klaten which said that the most respondents had ischemic strokes as much as 58.9% and showed that there was an influence between blood pressure/hypertension and the occurrence of strokes with a p value = 0.022.

According to Bekasi District Hospital researchers, 86.4% of those who had experienced a stroke had a history of hypertension. One of the elements that must be considered in the incidence of stroke is blood pressure. High blood pressure, or hypertension, is a key risk factor for both ischemic and hemorrhagic stroke. The long-term result of high blood pressure is damage to the artery walls, which makes it easier for the artery walls to thicken or narrow (atherosclerosis) or rupture blood vessels. Even though some people are unaware that they have hypertension, controlling blood pressure is associated with a significant reduction in the incidence of stroke. Patients with a history of hypertension are 0.161 times more likely to have a stroke than patients without a history of hypertension. High systolic blood pressure is strongly linked to an elevated risk of stroke or ischemic stroke. Stroke is more common in people with severe hypertension (blood pressure greater than 160/95 mmHg) than in people with normal blood pressure (blood pressure less than 140/90 mmHg). A person's risk of getting a stroke increases as their blood pressure rises.

Effect of History of Diabetes Mellitus on Stroke Incidence in Bekasi District Hospital

The Chi-Square statistical test yielded a value of p.0.002 (p.value 0.05), indicating that there is an association between the history of diabetes mellitus and the incidence of stroke. The study revealed an OR = 13.440, implying that respondents with a history of diabetes mellitus had a 13.440 likelihood of having a stroke compared to those without a history of diabetes mellitus. Individuals with diabetes have an increased chance of having a stroke than those who do not have diabetes. Diabetes mellitus is a disease that is frequently observed in conjunction with cerebrovascular illness, the second risk factor for stroke. Diabetes mellitus is defined as blood sugar levels greater than 200 mg/dl, fasting blood sugar levels greater than 140 mg/dl, or 2 hours postprandial blood sugar levels greater than 200 mg/dl (Smeltzer & Bare, 2014). Diabetes mellitus patients' bodies do not handle sugar adequately, they cannot digest fat efficiently, and they are at a high risk of getting hypertension. Diabetes also affects the body's ability to prevent blood clots, which raises the risk of ischemic stroke. High blood sugar levels will also increase the amount of infarction in the brain due to lactic acid produced by anaerobic glucose metabolism, which destroys brain tissue.

The results of this study are in line with the results of Purnomo's (13) at RSI Klaten which said that the most respondents had ischemic stroke as much as 58.9% and showed that there was an influence between blood sugar levels (p value 0.00) and the occurrence of a stroke. According to researchers at the Bekasi District Hospital, the results of the study found that there was an influence between diabetes mellitus and the incidence of stroke with a p value of 0.000. In a literature study, high blood glucose levels over time can cause an increase in the accumulation of fatty

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materials on the inside of the blood vessel walls. The buildup can affect blood flow, increasing the chance of blocked and hardening of the arteries (atherosclerosis).

CONCLUSION

Diabetes is a risk factor for stroke; patients who have DM and have a stroke may have a history of diabetes that is genetically inherited from the family and is exacerbated by unhealthy lifestyles such as eating a lot of sweet foods and fast food that is not balanced with regular exercise or tend to be lazy to move. Diabetes is a risk factor for stroke with an OR of 13,440, which means that individuals with a history of diabetes have a 13,440 times greater risk of having a stroke than patients without a history of diabetes. Diabetes mellitus accelerates cell aging due to high glucose levels, which is followed by blood vessel fragility, putting the patient at high risk of hypertension and heart disease, which ultimately increases the risk of stroke. Diabetes mellitus can alter the vascular system (blood vessels and the heart). Diabetes mellitus promotes the occurrence of atherosclerosis, making it more severe and broad, increasing the risk of stroke patients. Diabetes mellitus raises the risk of stroke by twofold when compared to persons who do not have diabetes mellitus. This is because high blood sugar levels raise the risk of atherosclerosis as well as the risk of additional strokes caused by hypertension, obesity, and hyperlipidemia. Thus, age, gender, history of hypertension, and history of diabetes mellitus all have an impact on the incidence of stroke in Bekasi District Hospital.

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