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Overview of risk factors in ischemic stroke patients at UKI general hospital for 2016-2017

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Abstract
Stroke is one of the non-communicable diseases that has recently become the concern of many people. Stroke is an emergency disease and requires help as soon as possible. In ischemic stroke, blockage occurs in blood vessels that cause the cessation of blood flow to the brain. This study aims to determine the risk factor os patient with ischemic stroke at the UKI General Hospital in 2016- 2017. This research design using the Descriptive Method. The data taken are secondary data by seeing the patient's medical record. Data is presented using a frequency table. Based on the data and results of the study, it was found that the highest group of age affected by Ischemic Stroke was at the age of 45-59 years with a percentage (53.2%). Moreover, based on gender, men at higher risk with percentage (57.3%), based tribes, Batak people is higher than the other (37.9%). Based on family history, there are many with a history of status (66.1%), based on the history of previous attacks (54.8%), based on a history of Diabetes mellitus is not much with the percentage (29%), as well as history heart (20.2%). Based on blood pressure, many people found in Stage 2 hypertension (47.6%), based on the total cholesterol level in the high limit category (49.2%) and based on smoking status is quite a lot with the percentage (43.5%).

Keywords: Ischemic stroke, age, gender, family history, ethnicity, previous attacks, risk factors of ischemic stroke

Introduction
Stroke is a non-communicable disease that is currently a concern for many people. Stroke is classified as cerebrovascular disease (CVD). CVD itself is an emergency disease that, if it occurs, requires speedy treatment. Stroke is a condition of some of the blood vessels in the brain that are disrupted in supplying blood in which there is oxygen and glucose used for the cell's metabolism in the brain. The vessels can work according to their functions. This attack is sudden and causes symptoms according to the part of the brain that does not receive the blood supply [1].
Stroke is the interruption of blood flow to the brain, generally due to rupture of blood vessels to the brain or due to blockage of blood vessels to the brain so that the supply of nutrients and oxygen to the brain is reduced [2]. A total of 20.5 million people in the world had a stroke in 2001, with hypertension sufferers contributing 17.5 million stroke cases. Stroke is one of the non-communicable diseases that is the most significant cause of death worldwide. CDC data (2013) also shows that stroke is the second leading cause of death in the world after heart disease [3].
Risk factors for stroke consist of risk factors that cannot be modified such as age, gender, race, family history, history of TIA (Transient Ischemic Attack), coronary heart disease, atrial fibrillation, and are heterozygous or homozygous for homocystinuria, and modifiable ones are hypertension, diabetes mellitus, smoking, alcohol and drug abuse, hyperuricemia and dyslipidemia [4]. These modifiable stroke risk factors are essential to know to prevent stroke itself. Generally, the main risk factors for stroke are hypertension, Diabetes, smoking and dyslipidemia.
Stroke can occur secondary to heart and circulation disorders, and vice versa. Stroke can cause heart and circulation disorders. The close relationship between heart disorders and stroke has long been known. The data suggest that cardiac abnormalities are a possible source of embolism in 30–45% of cases of cerebral infarction [5, 6].
According to Basic Health Research (Riskesdas), in 2007, one of the leading causes of death in Indonesia was a stroke, which is around 15.4%. The incidence of stroke is strongly influenced by several risk factors, one of which is significant. 6 Therefore, because of the importance of knowing the risk factors for the occurrence of stroke based on the data above, it is necessary to research the description of risk factors in ischemic stroke patients at UKI General Hospital. Jakarta in the period 2016 - 2017. The formulation of the problem formulation answered in this study is "What is the description of risk factors in ischemic stroke patients at UKI General Hospital for the period 2016-2017?" With the aim of research to determine the description of risk factors in ischemic stroke patients at UKI General Hospital, Jakarta in 2016-2017.

Literature Review
The human brain is the most complex organ in the human body, formed from 100 billion nerve cells called neurons. Each neuron is connected to other brain cells. The connections between neurons are needed for the brain to work optimally [7]. The brain will work to regulate the body and interpret all the sensations that the body gets, namely hearing, sight, touch, balance, taste, smell, pain, to think and interpret language.
Brain weight represents 2% of human body weight. The brain uses about 25% of the body's oxygen and 70% of the body's glucose. Unlike muscles, the brain does not store nutrients which is why it needs consistent nutrition. If there is a disturbance in blood flow to the brain for about 30 seconds, a decrease in consciousness can occur and permanent damage to brain tissue if blood flow is interrupted for approximately 4 minutes [8].
The nervous system in the brain itself is divided into 2, namely the central nervous system and the peripheral

nervous system. The central nervous system (CNS) is formed by the brain and spinal cord, while the peripheral nervous system (PNS) is the nervous system outside the CNS. The function of the PNS itself is to transmit information between the CNS and other body parts and vice versa [9].

The components of the brain itself consist of: a) The big brain, which is the part of the brain that makes humans have the ability to think, analyze, and others. The cerebrum consists of a pair of right and left hemispheres and has four lobes characterized by sulci (fissures) and gyrus (protruding lobes). The four lobes are the parietal lobe, frontal lobe, occipital lobe, and temporal lobe; b) The cerebellum is located in the head, close to the tip of the upper neck. Its parts are the anterior lobe, the medial lobe and the fluccolonodular lobe. The cerebellum itself contains more neurons than the brain as a whole. The input is 40 times more than the output. The cerebellum functions as a coordinating centre for balance and muscle tone, such as regulating posture and body position; c) Brain stem (Brainstem). This section communicates with the diencephalon above and the spinal cord below. This part of the brain regulates essential human functions, including breathing, heart rate, regulating body temperature, regulating the digestive process, and is the source of the basic human instinct (fight or flight) when danger comes.

The blood supply to the brain comes from two pairs of arteries, namely the vertebral arteries and the internal carotid arteries, which branch to form the circle of Willis. The internal carotid artery is a branch of the common carotid artery that ends at the anterior and middle cerebral arteries. At its end, the internal carotid artery becomes the posterior communicating artery which unites caudally with the posterior cerebral artery. The anterior cerebral arteries are interconnected via the posterior cerebral arteries. The left and right vertebral arteries arise from the subclavian artery on the same side. The right subclavian artery is a branch of the innominate artery, and the left subclavian artery is a direct branch of the aorta. The vertebral arteries enter the skull through the foramen magnum. These two arteries unite to form the basilar artery [10].

The venous blood flow in the brain is very different from the venous blood flow in the body. Generally, arteries and veins are located side by side, but this is different in the brain. The venous blood flow from the brain is mainly into the dura mater sinuses, a channel of blood vessels found in the dura mater structures. The venous sinuses collect blood from the brain and pass it to the internal jugular vein. The superior and inferior sagittal sinuses drain blood from the cerebrum, and the cavernosal sinuses drain blood from the anterior skull base. All sinuses eventually drain into the sigmoid sinus, which exits the skull and forms the jugular vein. These two jugular veins are the prominent veins in the brain. Symptoms of a stroke depend on the blood vessels and part of the brain affected. Brain cells cannot repair their damage. Therefore it will be challenging if there is tissue or cells that are damaged and die. If more than 10% of brain tissue is damaged or dies, it can lead to fatal things, namely death. Stroke are clinical signs that develop rapidly due to focal (or global) brain dysfunction, with symptoms lasting 24 hours or more or leading to death, with no apparent cause other than vascular. Stroke can also be defined as a disturbance of brain function, especially in blood flow. Stroke can occur rapidly in minutes or seconds [11].

Stroke is a clinical term for acute loss of perfusion in the brain. Therefore, stroke often causes abnormalities in the nerves suddenly. Nerve disorders appear following the part of the brain that is damaged due to impaired blood flow. The most common clinical manifestations are motor disturbances, sensory disturbances or language difficulties [12].

Stroke can be classified in several aspects. In general, stroke is classified into ischemic or non-hemorrhagic stroke (with or without bleeding) and hemorrhagic stroke, where hemorrhagic stroke can be in the form of intracerebral haemorrhage, intraventricular haemorrhage, and subarachnoid haemorrhage.

Ischemic stroke is a clinical sign of dysfunction or damage to brain tissue caused by a lack of blood flow to the brain, so that it interferes with the need for blood and oxygen in brain tissue. An ischemic stroke usually begins with several changes in the brain according to the affected part [13]. Because failures in the bloodstream can cause cell death (necrosis), if not handled quickly and adequately, it will cause death. Stroke is the third most common cause of death after cardiovascular disease in the United States. The death rate reaches 147,000 per year. Apart from being one of the causes of death, stroke is also one of the leading causes of disability due to illness. In severe cases, stroke can cause death, while in mild cases, stroke can cause a significant decrease in the patient's health status [14; 15].

The incidence of stroke in America in the last 30-35 years has decreased in contrast to that in Japan, which has increased, which causes higher incidence of stroke than coronary heart disease. Stroke mortality in Japan is also higher than in America [16]. Data from the Indonesian Stroke Foundation, it is said that the number of strokes in Indonesia will continue to increase every year, and based on the results of a survey conducted by the Indonesian Ministry of Health in 2010 on 987,205 respondents from 258,366 households, 33 provinces and 440 districts in Indonesia stated that stroke is a killer. Prominent among the urban population. Stroke is the leading cause of death at age > 45 years, with a large percentage of 15.4% of all deaths at that age. In addition, in Indonesia, the Batak and Padang tribes tend to be vulnerable to stroke. It is influenced by the pattern and type of food consumed, containing more cholesterol [17].

Stroke often attacks people in the middle and old age groups and is quite common in people over 55-65 years of age. The incidence of stroke will increase with age and is followed by the presence of risk factors of the person. In an ischemic stroke, a blockage can occur along the path of an artery leading to the brain. For example, a fatty deposit called atheroma can form in the carotid arteries causing blockage and causing reduced blood flow and cause the arteries to become stiff and narrower. This situation is considered very serious because each main carotid artery delivers blood to most of the brain [15].

These fatty deposits can be released from the artery walls and flow following the blood circulation, then clog smaller arteries. The carotid and vertebral arteries and their branches can also become blocked due to a blood clot originating elsewhere, for example, from the heart or its valves. Fat emboli form when fat from the ruptured bone marrow is released into the bloodstream and eventually occludes smaller arteries. Stroke can occur when there is inflammation in the body. This inflammation can cause narrowing of the blood vessels leading to the brain. Besides

being caused by bacteria, this stroke can also occur in someone who has excess uric acid levels in their blood [18]. Drugs can also cause strokes, such as cocaine, amphetamines, epinephrine, adrenaline, and so on, narrowing blood vessels and causing strokes, primarily if used in inappropriate doses. The function of the above drugs causes contraction of the arteries so that their diameter reases.

Risk factors for stroke are divided into two, modifiable risk factors and non-modifiable risk factors, and there are significant and minor risk factors. The significant risk factors include smoking, hypertension, heart disease, and a history of previous attacks. Risk factors that cannot be modified are age, gender, ethnicity, hered genetic [19; 20]. At the same time, the modifiable risk factors are hypertension (high blood pressure), heart disease, hypercholesterolemia, diabet ellitus, and obesity.

Ischemic stroke or blockage stroke is caused by a rapid and sudden occlusion of a blood vessel in the brain, interrupting blood flow. Brain tissue that is deprived of oxygen for more than 60 to 90 seconds will decline in function. Thrombus or blockage such as atherosclerosis causes ischemia in brain tissue and causes damage to the surrounding neuronal tissue due to the process of hypoxia and anoxia. An embolic blockage that forms in other circulating areas of the circulatory system, usually within the heart or atrial fibrillation complication that is released and enters the cerebral circulation, can also disrupt the cerebral circulatory system [21].

Acute occlusion of cerebral blood vessels makes the brain area divided into two brain-severe areas, namely the core area and the penumbra area. The core area is an area or part of the brain that has a blood flow of less than 10cc/100g of brain tissue per minute. This area is at risk of becoming necrotic within minutes. Then the penumbra area is an area of the brain whose blood flow is disrupted but is still better than the core area because this area still gets a perfusion supply from other blood vessels. The penumbra area has a blood flow of 10-25cc/100g of brain tissue per minute. The penumbral region has a better prognosis than the nuclear region [22]. The neurologic deficit from ischemic stroke depends not only on the area of the core and penumbra but also on the ability of the blockage to cause vascular stiffness or vasospasm. Damage to brain tissue due to occlusion or blockage of blood flow is a biomolecular process that is rapid and progressive at the cellular level. This process is known as the ischemic cascade. Once the blood flow is interrupted, the tissues become deprived of oxygen and glucose, which are the primary energy sources for carrying out the membrane potential process. This lack of energy makes the area deprived of oxygen and blood sugar carry out anaerobic metabolism [23].

This anaerobic metabolism stimulates the release of glutamate compounds. Glutamate acts on receptors on nerve cells (particularly he NMDA/N-methyl-D-aspartate receptor), producing an influx of sodium and calcium. The influx of sodium makes the amount of intracellular fluid increase and ultimately causes tissue oedema. Calcium influx stimulates the release of proteolytic enzymes (proteases, lipases, nucleases) that break down proteins, fats and cell structures [24]. Calcium influx can also cause the failure of mitochondria, a membrane organelle that functions to regulate cell metabolism. These failures cause brain cells to die or become necrotic eventually.

Research Method

The method used in this study is descriptive, which describes a phenomenon based on past ata, namely researchers looking at medical records of patients with a history of stroke to determine their risk factors at UKI General Hospital for the period 2016-2017. The location of data collection was carried out at UKI General Hospital, Jl. Major General Sutoyo, No. 2 Cawang, East Jakarta. The research data collection was carried out in Septemb 2018. The target population of this study was all data on patients with ischemic stroke at UKI General Hospital, Jakarta, from January 2016 to December 2017. The research sample was all data on patients suffering from an ischemic stroke who derwent treatment. At UKI General Hospital, Jakarta, from January 1, 2017, to D ember 31, 2017. The data was collected by reviewing secondary data. Namely, data obtained through other parties, not directly obtained by researchers from the research subject and the technique used for data collection is using medical records. The instrument used in this study was secondary data obtained from medical records of ischemic stroke patients who had undergone treatment at UKI General Hospital from January 2016 to cember 2017. The data analysis was used as a univariate analysis. Univariate analysis was used to describe the distribution and frequency of the observed variables. In this study, the univariate analysis aims to determine the description r risk factors for age, gender, family history, ethnicity, history of attacks, history of diabetes mellitus, history of heart disease, history of blood pressure, history of total cholesterol, and history of smoking in ischemic stroke patients at UKI General Hospital.

Result and Discussion

This research is descriptive which aims to describe the risk factors for ischemic stroke. This research was conducted at the Medical Record Unit of the UKI Hospital in September 2018. Sampling used the purposive sampling method, where the entire population that entered the inclusion criteria would be used as research samples. The object of this study was Ischemic Stroke Patients who were included in the inclusion criteria in the period January 2016-December 2017. A total of 151 samples had Ischemic Stroke ng the 2016-2017 period, with 124 samples selected based on inclusion and exclusion criteria. The research results obtained are as follows.

Table 1: Overview of Ischemic Stroke patient data based on risk factors for age

Age	Frequency	%	Total
Mature	6	4,8	6
middle age	66	53,2	66
Elderly	41	33,6	41
Old age	11	8.8	11
Ancient age	0	0	0
Total	124	100,0	124

Based on the table above, it was found that the highest number in middle age, namely the age of 45-59 years, as many as 66 (53.2%) patients. Then followed by patients in the elderly category, namely 60-70 years as many as 41 with a percentage of 33.6%, elderly the elderly are 71-90 years as

many as 11 people with a percentage of 8.8%, adults aged 30-44 years as many as six people with a percentage of 4.8% and the last are ancient age, which is above 90 years with a percentage of 0% or no patients are the same very.

Table 2: Overview of Ischemic Stroke patient data based on gender risk factors

Gender	Frequency	%	Total
Female	53	42,7	53
Male	71	57,3	53
Total	124	100,0	124

Based on the table above description, it was found that the highest number of the male sex was 71 (57.3%) people, and continued with female sex as many as 53 people with a percentage of 42.7%.

Table 3: Description of Ischemic Stroke patient data based on family history risk factors

Family History Risk	Frequency	%	Total
Yes	82	66,1	82
No	42	33,9	42
Total	124	100,0	124

Based on the table above, it was found that the highest number of patients who had a family history of stroke was 82 people with a percentage of 66.1%, and patients without a family history of ischemic stroke were 42 people with a percentage of 33.9%.

Table 4: Overview of Ischemic Stroke patient data based on ethnic risk factors

Ethnic Risk Factors	Frequency	%	Total
Batak	47	37,9	47
Sunda	11	8,9	11
Jawa	40	32,2	40
Betawi	20	16,1	20
Bugis	1	0,8	1
Minang	2	1,6	2
Manado	1	0,8	1
Aceh	1	0,8	1
Flores	1	0,8	1
Total	124	100,0	124

Based on the description of the table above, the highest number of patients with Batak ethnicity was 47 people with a percentage of 37.9%. Followed by patients with Javanese ethnicity as many as 40 (32.2%) people, Betawi people as many as 20 (16.1%) people, Sundanese as many as 11 (8.9%) people, Mining tribe as many as two (1.6%) people, followed by the Bugis, Manado, Aceh, and Flores tribes, each with one person with a percentage of 0.8%.

Table 5: Overview of Ischemic Stroke patient data based on risk factors for previous attack history

Risk Factors for Previous Attack History	Frequency	%	Total
Yes	68	54,8	68
No	56	45,2	56
Total	124	100,0	124

Based on the table above, it was found that the highest number of patients who had a history of a previous stroke was 68 (54.8%) people, and patients without a history of a previous stroke were 56 people with a percentage of 45.2%.

Table 6: Description of Ischemic Stroke patient data based on risk factors for Diabetes Mellitus

Risk Factors for Diabetes Mellitus	Frequency	%	Total
Yes	36	29,0	36
No	88	71,0	88
Total	124	100,0	124

Based on the table description above, it was found that the highest number of patients who did not have a previous history of Diabetes Mellitus was 15 people with a percentage of 71%, and patients with a previous history of Diabetes Mellitus were 36 people with a percentage of 29%.

Table 7: Description of Ischemic Stroke patient data based on risk factors for heart disease

Factors for Heart Disease	Frequency	%	Total
Yes	25	20,2	25
No	99	79,8	99
Total	124	100,0	124

Based on the table above, it was found that the highest number of patients with no previous history of heart disease was 99 people with a percentage of 79.8%, and patients with a history of previous heart disease were 25 people with a percentage of 20.2%.

Table 8: Overview of Ischemic Stroke patient data based on risk factors Blood pressure

Risk Factors for Blood Pressure	Frekuensi	%	Total
Normal (systolic < 120 or diastolic < 80 mmHg)	2	1,6	2
Pre-Hypertension (systolic 120-139 or diastolic 80-89 mmHg)	14	11,3	14
Stage 1 hypertension (systolic 140-159 or diastolic 90-99 mmHg)	49	39,5	49
Stage 2 hypertension (systolic > 160 or diastolic > 100 mmHg)	59	47,6	59
Total	124	100,0	124

Based on the table above, the highest number of patients with Stage 2 hypertension was 59 people, with 47.6%. Followed by patients with Hypertension Stage 1 as many as 49 (39.5%) people, Pre-Hypertension as many as 14 people with a percentage of 11.3%.

Table 9: Overview of Ischemic Stroke patient data based on total cholesterol risk factors

Total Cholesterol Risk	Frekuensi	%	Total
Normal	42	33,9	42
Batas tinggi	61	49,2	61
Tinggi	21	16,9	21
Total	124	100,0	124

Based on the description of the table above, the highest number of patients with total cholesterol levels in the high limit category was 61 people with a percentage of 49.2%. Followed by patients with total cholesterol levels in the Normal category as many as 42 people with a percentage of 33.9%, and patients with total cholesterol levels in the High category as many as 21 people with a percentage of 16.9%.

Table 10: Overview of Ischemic Stroke patient data based on risk factors Smoking status

Smoking Status	Frekuensi	%	Total
Yes	54	43,5	54
No	70	56,5	70
Total	124	100,0	124

Based on the table above it was found that the highest number of patients who did not have a history of active smoking status were 70 people with a percentage of 43.5%, and patients with a history of active smoking status were 54 people with a percentage of 43.5%.

Based on research carried out using secondary data from medical records at UKI General Hospital, Jakarta, in 2018, data has been obtained regarding the description of the risk factors possessed by ischemic stroke patients who were respondents in this study. The data will be used as a basis for discussing the final results of this study, which can be described as follows.

The majority of ischemic stroke patients at UKI General Hospital, Jakarta, are in the middle age group, namely 45-59 years, as many as 66 people with a percentage of 53.2%. It illustrates that ischemic stroke tends to attack people with an older but still productive age group for the first time. Of the 124 respondents whose medical records were studied, as many as 66 patients (53.2%) were middle age 45-59 years, 41 patients (33.6%) were elderly 60-70 years old, 11 patients (8.8%) were elderly 71-90 years, and six patients (4.8%) were adults 30-44 years. These results are in line with the results of research conducted at the Haji Adam Malik Central General Hospital, Medan, which said that as many as 43 patients (43.4%) aged 51-65 years were in the middle age group often suffered from ischemic stroke.

From the results above, it can be concluded that someone older tends to be more prone to ischemic stroke. Because as discussed earlier, the blood vessels in an older person tend to change with age, making it riskier, which will ultimately result in atherosclerosis.

The ischemic stroke patients at UKI General Hospital, Jakarta, are male, as many as 71 people with 57.3%. It illustrates that ischemic stroke tends to occur in men compared to women. Of the 124 respondents whose medical records were examined, 71 patients (57.3%) were male, and 53 patients (42.7%) were female. This result is inversely proportional to the results of research conducted at Prof. Hospital. DR. R. D Kandou Manado, in the period July 2012-June 2013 who said that as many as 33 patients (55%) male suffered from ischemic stroke compared to 27 female patients (27%).

The results of this study are in line with previous research. Thus, it can be concluded that there are more male patients than female patients because male patients tend to have a history of active smoking and female patients are still protected from stroke and heart disease until middle age due to the presence of the hormone estrogen in them.

The majority of ischemic stroke patients at UKI General Hospital, Jakarta, have a family history of ischemic stroke as many as 82 people, with 66.1%. It illustrates that ischemic stroke tends to occur in patients with family history than those without a history. Of the 124 respondents whose medical records were examined, 82 patients (66.1%) had a family history and 42 patients (33.9%) without a family history. These results are in line with the results of a study conducted at the Soedarso Regional General Hospital, Pontianak, which said that the number of patients with a family history was more than patients without a family history with a comparison of 38 patients (82.6%) with family history and eight patients [17.4%) without a family history of a total of 46 patients.

The similarities between this study and previous studies support the fact that there is a significant relationship between family history and the incidence of ischemic stroke. It is proven that having a history of the disease in other family members can increase a person's risk of developing ischemic stroke.

The majority of patients with ischemic stroke at UKI General Hospital, Jakarta, consist of the Batak ethnic group of as many as 47 people with 37.9%. It illustrates that ischemic stroke occurs in patients with the Batak ethnic group compared to other ethnic groups. Of the 124 respondents whose medical records were studied, there were 47 patients (37.9%) with the Batak ethnicity, 40 patients (33.9%) with the Javanese ethnicity, 20 patients (16.1%) with the Betawi ethnicity, 11 patients (8, 9%) with Sundanese ethnicity, two patients (1.6%) with Mining ethnicity and one patient (0.8%) with Bugis, Manado, Aceh, and Flores ethnicities.

Research on ethnicity as one of the risk factors for ischemic stroke shows that the Batak tribe is one of the tribes with the most ischemic stroke patients. It can be related to people with the Batak tribe's lifestyle habits, which are identical to eating fatty foods, alcoholic beverages, and active smoking.

Ischemic stroke patients at UKI General Hospital, Jakarta, have a history of previous strokes, as many as 68 people with a percentage of 54.8%. It illustrates that ischemic stroke is generally more common in patients with a history of stroke than those without a history. Of the 124 respondents whose medical records were examined, there were 68 patients (54.8%) with a history of previous attacks and 56 patients (45.2%) without a history of previous attacks.

According to the United Kingdom National Health Service (NHS), someone who has had a previous stroke, usually a minor stroke and a TIA (Transient Ischemic Attack), has a greater chance of getting another attack, especially if they do not get prompt and appropriate treatment such as taking aspirin at night. First, the attack happened.

The majority of patients with ischemic stroke at UKI General Hospital, Jakarta, have no history of Diabetes mellitus, as many as 88 people with 71%. It illustrates that diabetes mellitus is not a significant risk factor in the occurrence of ischemic stroke. Of the 124 respondents whose medical records were examined, as many as 88 patients (71%) without a history of Diabetes mellitus and 36 patients (29%) with a history of Diabetes mellitus. These results are in line with the results of research conducted at the Haji Adam Malik Central General Hospital, Medan, which said that the number of patients without a history of Diabetes mellitus was more than patients with a history of Diabetes mellitus, a comparison of 57 patients (57.6%) without a history of Diabetes mellitus and 42 patients (42.4%) with a history of Diabetes mellitus from a total of 99 patients.

Although several research results show that diabetes mellitus is not a significant risk factor, some theories state that Diabetes mellitus can make the walls of the blood vessels of the brain experience thickening. Then it will narrow the diameter of these blood vessels, which will

eventually hinder the smooth flow of blood to the brain results in the death of brain cells.

The majority of ischemic stroke patients at UKI General Hospital, Jakarta, have no history of heart disease as many as 99 people with a percentage of 79.8%. It can illustrate that heart disease is not a significant risk factor in the occurrence of ischemic stroke. Of the 124 respondents whose medical records were studied, as many as 99 patients (79.8%) without a history of Diabetes mellitus and 25 patients (20.2%) with a history of heart disease. These results have similarities with the results of a study conducted at the Haji Adam Malik Central General Hospital, Medan, which said that the number of patients without a history of heart disease was more than patients with a history of heart disease, with a comparison of 74 patients (74.7%) without a history of heart disease. Diabetes mellitus and 25 patients (25.3%) with a history of Diabetes mellitus from 99 patients.

It can be said that more people who suffer from ischemic stroke are not due to previous heart disease but can be caused by other risk factors.

The ischemic stroke patients at UKI General Hospital, Jakarta, are more likely to have blood pressure in the Stage 2 Hypertension category as many as 59 people with a percentage of 47.6%. It can illustrate that high blood pressure dramatically affects the occurrence of ischemic stroke. This statement is supported by other results, namely, from 124 respondents whose medical records were studied, there were 59 patients (47.6%) with blood pressure in the Stage 2 Hypertension category, 49 patients (39.5%) with blood pressure category Hypertension Stage 1, 14 patients (11.3%) with blood pressure category Pre-Hypertension and two patients (1.6%) with blood pressure normal category. These results are in line with research conducted at the Haji Adam Malik Central General Hospital, Medan, which had the results of 42 patients (42.4%) with blood pressure in the category of Stage 2 hypertension, 25 patients (25.3%) with blood pressure in the category of hypertension. Stage 1, 16 patients (16.2%) with pre-hypertension category blood pressure and 16 patients (16.2%) with normal blood pressure.

The results of some of these studies refer to the occurrence theory of blood vessel rupture or narrowing of blood vessels. If a person has hypertension, it allows thinning of the walls of blood vessels and damage to the inside of the blood vessels, which encourages the accumulation of plaque in the blood vessels. If the person's blood pressure is high, the results can trigger the occurrence of rupture of blood vessels in the brain or, due to plaque build-up, can trigger obstruction blood flow to the brain, which ultimately leads to the death of cells in the brain.

More ischemic stroke patients are at UKI General Hospital, Jakarta, with total cholesterol levels in the high limit category, as many as 61 people with 49.2%. It can illustrate that total cholesterol is a risk factor that is quite important in the occurrence of ischemic stroke. This statement is supported by other results, namely, from 124 respondents whose medical records were studied, there were 61 patients (49.2%) with total cholesterol levels in the high category limit, 42 patients (33.9%) with normal total cholesterol levels and 21 patients (16.9%) with high total cholesterol levels. This result is slightly different from the previous study, which had 60 patients (60.6%) with low total cholesterol levels, 29 patients (29.3%) with moderate total cholesterol levels, nine patients (9.1%) with moderate cholesterol levels high category total cholesterol.

Although the study results showed that many patients had cholesterol levels that were still in high limits, cholesterol levels in the blood were an essential aspect of the risk factor for ischemic stroke. Cholesterol is a substance in the body's bloodstream. Total cholesterol includes LDL and HDL cholesterol and other fats whose total should not exceed 200 mg/dl. The higher the cholesterol level in a person's bloodstream, the higher the chance of narrowing of blood vessels due to fat accumulation. The compensation is an interruption of blood flow to the brain [25; 26].

The majority of ischemic stroke patients at UKI General Hospital, Jakarta, have inactive smoking status. With a total of 70 people with a percentage of 56.5%. It illustrates that ischemic stroke occurs in patients without active smoking status compared to those with active smoking status. Of the 124 respondents whose medical records were examined, 70 patients (56.5%) had a history of active smoking, and 54 patients (43.5%) had a history of active smoking. These results are in line with the research results conducted at the Haji Adam Malik Central General Hospital, Medan. Yang said that the number of patients without a history of active smoking was more than patients with a history of active smoking with a comparison of 76 patients (876.8%) without a history of active smoking and 23 patients (23.2%) with a history of active smoking from a total of 99 patients.

Although in theory, smoking is one of the risk factors for stroke because smoking behaviour is related to hypercoagulation in the body, leading to the formation of thrombus and plaque. However, the effect of smoking itself is long-term, which takes time to occur, allowing patients with inactive smoking status to have an ischemic stroke due to the lack of data on their smoking history, allowing for differences in research results and theories.

Conclusion

Based on research that has been conducted regarding the description of risk factors in ischemic stroke patients at UKI General Hospital, Jakarta in 2018 with a sample of 124 patients, the following conclusions can be drawn: a) Based on the results of research using medical records, it was found that the majority 66 patients (53.2%) experienced ischemic stroke; b) Based on the results of the study using medical records, it was found that the majority of patients with male sex were 71 people (57.3%) who had an ischemic stroke; c) Based on the results of research using medical records, it was found that the majority of patients with a family history of stroke were 82 people (66.1%) who had an ischemic stroke; d) Based on the results of research using medical records, it was found that the majority of patients with Batak ethnicity were 47 people (37.9%) who had ischemic stroke; e) Based on the results of research using medical records, it was found that the majority of patients with a history of previous stroke were 68 people (54.8%) who had an ischemic stroke; f) Based on the results of research using medical records, it was found that the majority of patients without a history of diabetes mellitus were 88 people (71%) who had an ischemic stroke; g) Based on the results of research using medical records, it was found that the majority of patients without a history of heart disease were 99 people (79.8%) who had ischemic stroke; h) Based on the results of the study using medical records, it was found that the majority of patients with blood pressure

of Stage 2 hypertension (systolic > 160 or diastolic > 100 mmHg) were 59 people (47.6%) who had an ischemic stroke; i) Based on the results of research using medical records, it was found that the majority of patients with cholesterol levels in the high limit category (200-239 mg/dl) were 61 people (49.2%) who had ischemic stroke; and j) Based on the results of the study using medical records, it was found that the majority of patients without active smoking status were 70 people (56.5%) who had ischemic stroke.

References

1. Kernich, Catherine A. "Hemorrhagic stroke." The neurologist,2002:8(4):277-278.
2. Rudd Anthony G, Audrey Bowen G. Young, and Martin A. James. "National clinical guideline for stroke: 2016." Clinical Medicine, 2017.
3. Benjamin Emelia J, Michael J Blaha, Stephanie E Chiuve, Mary Cushman, Sandeep R Das, Rajat Deo, Sarah D. De Ferranti *et al*. "Heart disease and stroke statistics—2017 update: a report from the American Heart Association." *circulation*,2017:135(10):e146-e603.
4. Alharbi, Abeer Surihan, Muneera Saeed Alhayan, Shahad Khalid Alnami, Reem Saeed Traad, Mubarak Ali Aldawsari, Saleh Abdullah Alharbi, Amani Omar Al Sharif *et al*. "Epidemiology and Risk Factors of Stroke." Archives of Pharmacy Practice, 2019, 10(4).
5. Arboix Adria, Josefina Alioc. "Cardioembolic stroke: clinical features, specific cardiac disorders and prognosis." Current cardiology reviews,2010:6(3):150-161.
6. Varona JF, Guerra JM, Bermejo F, Molina JA, Gomez De La Cámara A. "Causes of ischemic stroke in young adults, and evolution of the etiological diagnosis over the long term." European neurology,2007:57(4):212-218.
7. Bargmann Cornelia I, Eve Marder. "From the connectome to brain function." Nature methods,2013:10(6):483-490.
8. McDaniel Mark A, Steven F, Maier Gilles O. Einstein. ""“Brain-specific” nutrients: a memory cure?." Nutrition, 2003:19:11-12:957-975.
9. Kaucká, Markéta, Igor Adameyko. "Non-canonical functions of the peripheral nerve." Experimental cell research,2014:321(1):17-24.
10. Gumus Terman, Baran Önal, Erhan T Ilgit. "Bilateral persistence of type 1 proatlantal arteries: report of a case and review of the literature." American journal of neuroradiology,2004:25(9):1622-1624.
11. Liu Ran R, Timothy H Murphy. "Reversible Cyclosporin A-sensitive Mitochondrial Depolarization Occurs within Minutes of Stroke Onset in Mouse Somatosensory Cortex in Vivo." Journal of Biological Chemistry,2009:284(52):36109-36117.
12. Piek Jan P, Murray J mDyck. "Sensory-motor deficits in children with developmental coordination disorder, attention deficit hyperactivity disorder and autistic disorder." Human movement science,2004:23(3-4):475-488.
13. Chen Ruo-Li, Joyce S Balami, Margaret M Esiri, Liang-Kung Chen, Alastair M Buchan. "Ischemic stroke in the elderly: an overview of evidence." Nature Reviews Neurology,2010:6(5):256-265.
14. Siegler JE, Heslin ME, Thau L, A Smith, Jovin TG. "Falling stroke rates during COVID-19 pandemic at a comprehensive stroke center." Journal of Stroke and Cerebrovascular Diseases,2020:29(8):104953.
15. Dąbrowska-Bender, Marta, Magdalena Milewska, Aleksandra Gołąbek, Aneta Duda-Zalewska, and Anna Staniszewska. "The impact of ischemic cerebral stroke on the quality of life of patients based on clinical, social, and psychoemotional factors." *Journal of Stroke and Cerebrovascular diseases*,2017:26(1):101-107.
16. Venketasubramanian, Narayanaswamy, Byung Woo Yoon, Jeyaraj Pandian, and Jose C. Navarro. "Stroke epidemiology in south, east, and south-east Asia: a review." Journal of stroke,2017:19(3):286.
17. Lestari Diah, Fatwa Imelda, Febrina Oktavinola Kaban. "Overview Of Health Characteristics Of Blood Pressure, Cholesterol, Uric Acid And Blood Sugar Levels In An-Nur Women's Marindal Village 1 Kec. Patumbak Kab. Deli Serdang." *Abdimas Talen TA: Jurnal Pengabdian Kepada Masyarakat*,2019:4(1):45-54.
18. Storhaug, Hilde M, Jon V Norvik, Ingrid Toft, Bjorn O Eriksen, Maja-Lisa Løchen, Svetlana Zykova, Marit Solbu, Sarah White, Steve Chadban, and Trond Jenssen. "Uric acid is a risk factor for ischemic stroke and all-cause mortality in the general population: a gender specific analysis from The Tromsø Study." BMC cardiovascular disorders,2013:13(1):1-10.
19. Sacco, Ralph L. "Newer risk factors for stroke." Neurology,2001:57(2):S31-S34.
20. Owolabi Mayowa O, Fred Sarfo, Rufus Akinyemi, Mulugeta Gebregziabher, Onoja Akpa, Albert Akpalu, Kolawole Wahab *et al*. "Dominant modifiable risk factors for stroke in Ghana and Nigeria (SIREN): a case-control study." The Lancet Global Health,2018:6(4):e436-e446.
21. Formaggia, Luca, Alfio Quarteroni, and Allesandro Veneziani, eds. *Cardiovascular Mathematics:* Modeling and simulation of the circulatory system. Springer Science & Business Media, 1, 2010.
22. Heiss, Wolf-Dieter. "Radionuclide imaging in ischemic stroke." Journal of Nuclear Medicine,2014:55(11):1831-1841.
23. Cater, Heather L., Arvind Chandratheva, Christopher D. Benham, Barclay Morrison III, and Lars E. Sundstrom. "Lactate and glucose as energy substrates during, and after, oxygen deprivation in rat hippocampal acute and cultured slices." Journal of neurochemistry,2003:87(6):1381-1390.
24. Mei Yu, Melissa D. Thompson, Richard A. Cohen, Xiao Yong Tong. "Autophagy and oxidative stress in cardiovascular diseases." *Biochimica et Biophysica Acta (BBA)-Molecular Basis of Disease*,1852(2):243-251.
25. Murphy Timothy H, Dale Corbett. "Plasticity during stroke recovery: from synapse to behaviour." Nature reviews neuroscience,2009:10(12):861-872.
26. Ren Hugang, Congwu Du, Zhijia Yuan, Ki Park Nora D Volkow, Yingtian Pan. "Cocaine-induced cortical microischemia in the rodent brain: clinical implications." Molecular psychiatry,2012:17(10):1017-1025.

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