CLINICAL PROFILE OF STROKE PATIENTS IN GOTONG ROYONG HOSPITAL

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ABSTRACT

Introduction: Stroke is a global health issue due to its high prevalence, mortality, and associated disabilities. The Global Burden of Disease Study identifies ischemic and hemorrhagic strokes as significant contributors to global health burdens. Understanding these factors in different populations is crucial for developing targeted interventions and improving patient outcomes. **Method:** This retrospective descriptive study analyzed medical records of stroke patients at Gotong Royong Hospital from January to December 2023. Patients aged 18 years or older with acute stroke confirmed by CT or MRI were included. **Result:** Out of 224 stroke patients, 58% were male and 42% female. Most patients were over 70 years old (31.7%), with 29% aged 51-60 and 26.3% aged 61-70. Ischemic stroke was predominant (91.5%), while 8.5% had hemorrhagic stroke. Many patients (40.2%) arrived at the emergency department more than 24 hours after symptom onset. Hypertension was present in 68.8% of patients, diabetes in 36.6%, and dyslipidemia in 24.1%. The average length of stay was 4.13 days. Blood pressure measurements showed high prevalence of Grade 2 hypertension in systolic (37.05%) and prehypertension in diastolic (30.80%). Laboratory results revealed mean random blood glucose of 174.3 mg/dL, fasting blood glucose of 110.42 mg/dL, HbA1C of 8.06%, LDL cholesterol of 120.31 mg/dL, and triglycerides of 151.26 mg/dL. **Conclusion:** The majority of acute stroke patients at Gotong Royong Hospital are male, over 60, with ischemic stroke, and present more than 24 hours post-onset. These patients typically have a history of hypertension but no previous strokes, with an average hospital stay of 4 days. Many exhibits Grade 2 hypertension in systolic blood pressure and prehypertension in diastolic pressure. Understanding these profiles can guide better management and preventive strategies for stroke patients.

Keywords: profile, risk factor, elderly, hemorrhagic stroke, ischemic stroke

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INTRODUCTION

Stroke is a global health problem due to its high prevalence, mortality, and the disabilities it causes. According to the Global Burden of Disease Study in 2013, ischemic and hemorrhagic strokes collectively contribute significantly to the global health burden.[1] The prevalence of stroke varies depending on factors such as stroke type, study design, and geographic location. Several studies have shown that stroke prevalence ranges from 7% to 67.3%, with hypertension, dyslipidemia, lack of physical activity, and coronary artery disease identified as significant risk factors.[2–4] Furthermore, the risk of recurrent stroke is approximately 4% within the first month and 12% within the first year after the initial stroke, often associated with atherosclerotic and cardiovascular risk factors.[5]

Various studies have highlighted the importance of understanding stroke prevalence in different populations. For instance, research in China has demonstrated geographic variations in stroke prevalence, influenced by urban-rural differences over time.[6] Some studies have shown that stroke prevalence is affected by sociodemographic factors, lifestyle, and comorbid conditions such as hypertension, diabetes mellitus, and cardiovascular diseases.[7–9] The impact of stroke after an acute attack leaves individuals with a history of stroke at an increased risk of developing dementia and cognitive impairment.[10]

In addition, stroke significantly contributes to mortality rates. In Indonesia, stroke is the leading cause of death, with a mortality rate of 131.8 per 100,000 population. Globally, stroke is the second leading cause of death after coronary heart disease.[11] Understanding the risk factors associated with stroke, such as hypertension, diabetes, and dyslipidemia, is crucial for preventive measures and improving health outcomes for at-risk individuals.[7,9,12] This comprehensive approach can inform tailored prevention strategies, enhance early detection, and optimize treatment protocols, ultimately contributing to better management of stroke patients and reducing the overall burden of this debilitating condition. Thus, the present study aims to provide a detailed analysis of these factors among stroke patients at Gotong Royong Hospital, offering valuable data to guide clinical practices.

METHOD

This study is a retrospective descriptive study based on the medical records of stroke patients at Gotong Royong Hospital from January to December 2023. The study included patients aged 18 years or older with acute

stroke, verified by head computerized tomography (CT) or magnetic resonance imaging (MRI). Patients who did not meet the inclusion criteria were excluded from the study. Total sampling was used in this research by including data from all patients who met the inclusion criteria.

The study aimed to observe patients' characteristics, unmodifiable risk factors, and modifiable risk factors. Unmodifiable risk factors included age and sex, while modifiable risk factors encompassed a history of hypertension, diabetes, previous stroke, and dyslipidemia. Investigations performed included initial blood pressure at the emergency room, fasting and random blood glucose levels, HbA1C, and a fasting lipid profile (triglycerides and LDL). Other data collected included length of stay, onset-to-presentation time, and initial blood pressure at the emergency room. The data collected provided a comprehensive profile of stroke patients treated at Gotong Royong Hospital during the specified period.

RESULT
Gender

Out of 224 stroke patients, the majority are male, with 130 patients (58%), while 94 patients (42%) are female. This indicates that stroke incidence is higher in males than in females at Gotong Royong Hospital.

Age

The age distribution of stroke patients shows that the age group above 70 years is the most prevalent, with 71 patients (31.7%). The age group 51-60 years is also significant with 65 patients (29%), followed by the age group 61-70 years with 59 patients (26.3%). The age group 41-50 years has 23 patients (10.3%), and the age group under 40 years is the least, with only 6 patients (2.7%).

Type of Stroke

The majority of patients suffer from ischemic stroke, with 205 patients (91.5%), while 19 patients (8.5%) suffer from hemorrhagic stroke. This shows that ischemic stroke is more dominant among stroke patients at this hospital.

Stroke Onset

Based on stroke onset, most patients arrived at the hospital more than 24 hours after the onset of symptoms, with 89 patients (39.7%). Patients who arrived within less than 4.5 hours numbered 49 (21.9%), followed by those who arrived between 4.5 to 12 hours with 48 patients (21.4%), and patients who arrived within 12 to 24 hours numbered 38 (17%).

Medical History

Common medical histories among stroke patients include hypertension, found

in 154 patients (68.8%). Diabetes mellitus is also quite common with 82 patients (36.6%), followed by dyslipidemia in 54 patients (24.1%). Most patients do not have a history of previous strokes, with 136

patients (60.7%). A total of 71 patients (31.7%) have had one previous stroke, and 17 patients (7.6%) have a history of more than one stroke.

Tabel 1. Clinical Profile of Stroke Patients in Gotong Royong Hospital

Variable	N (%)	Mean ± SD	Median (Min-Max)
Gender			
Male	130 (58%)	-	
Female	94 (42%)		
Age			
< 40 years	6 (2.7%)		
41-50 years	23 (10.3%)		
51-60 years	65 (29%)	63.98 ± 12.54	64 (29-91)
61-70 years	59 (26.3%)		
> 70 years	71 (31.7%)		
Type of Stroke			
Ischemic	205 (91.5%)	-	
Hemorrhagic	19 (8.5%)		
Stroke Onset			
< 4.5 hours	49 (21.8%)		
4.5 – 12 hours	47 (21%)	-	
12 – 24 hours	38 (17%)		
> 24 hours	90 (40.2%)		
Medical History			
Hypertension	154 (68.8%)		
Diabetes Mellitus	82 (36.6%)	-	
Dyslipidemia	54 (24.1%)		
Previous Stroke History			
No history of stroke	136 (60.7%)		
1 time	71 (31.7%)	-	
>1 time	17 (7.6%)		
Length of treatment (days)	-	4.13 ± 2.64	4 (1-17)

Length of Stay

The average length of stay for stroke patients at Gotong Royong Hospital is 4.13 days with a standard deviation of ± 2.64 days. The median length of stay is 4 days, with a range of stay between 1 to 17 days. This indicates that most patients are treated for about 4 days, although there is

considerable variability in the duration of stay depending on each patient's condition and needs.

Blood Pressure

The initial blood pressure profile of stroke patients at Gotong Royong Hospital

reveals significant findings (Table 2). The mean systolic blood pressure was 150.64 ± 30.22 mmHg, with a median of 150 mmHg (range 90-260 mmHg). Notably, 8.48% of patients had normal systolic blood pressure, while 22.32% were classified as prehypertensive. The majority of patients were hypertensive, with 32.14% falling into Hypertension Grade 1 and 37.05% into

Hypertension Grade 2. Similarly, the mean diastolic blood pressure was 88.46 ± 14.31 mmHg, with a median of 90 mmHg (range 60-120 mmHg). Among the patients, 14.29% had normal diastolic blood pressure, and 30.80% were prehypertensive. Hypertension Grade 1 and Grade 2 were prevalent, observed in 26.79% and 28.13% of patients, respectively.

Tabel 2. Initial Blood Pressure Profile of Stroke Patients in Gotong Royong Hospital

Initial Blood Pressure	N (%)	Mean ± SD	Median
Systolic Blood Pressure			
Normal (<120 mmHg)	19 (8.48%)		
Prehypertension (120-139 mmHg)	50 (22.32%)	150.64 ± 30.22	150 (90-260)
Hypertension Grade 1 (140-159 mmHg)	72 (32.14%)		
Hypertension Grade 2 (≥ 160 mmHg)	83 (37.05%)		
Diastolic Blood Pressure			
Normal (<80 mmHg)	32 (14.29%)		
Prehypertension (80-89 mmHg)	69 (30.80%)	88.46 ± 14.31	90 (60-120)
Hypertension Grade 1 (90-99 mmHg)	60 (26.79%)		
Hypertension Grade 2 (≥ 100 mmHg)	63 (28.13%)		

Laboratory Examination

The laboratory examination results in this study included blood glucose profiles (random blood glucose, fasting blood glucose, and HbA1C) and lipid profiles (LDL and triglycerides), as shown in Table 3. Random blood glucose levels were measured in 198 out of 224 patients, with a mean value of 174.3 mg/dL and a standard deviation of 102.96 mg/dL. Fasting blood glucose and HbA1C levels were assessed in

83 and 85 patients, respectively. The mean fasting blood glucose level was 110.42 mg/dL with a standard deviation of 35.46 mg/dL, and the mean HbA1C level was 8.06% with a standard deviation of 2.59%. Lipid profile examinations were conducted on 170 patients, revealing a mean LDL level of 120.31 ± 43.85 mg/dL, and a mean triglyceride level of 151.26 ± 96.10 mg/dL.

Tabel 3. Laboratory Profile of Stroke Patients in Gotong Royong Hospital

Laboratory Examination	Mean ± SD	Median (Min-Max)
Random Blood Sugar (n = 198)	174.3 ± 102.96	137 (32-704)
Fasting Blood Sugar (n = 83)	110.42 ± 35.46	101 (75-297)
HbA1C (n = 85)	8.06 ± 2.59	7.2 (3.9-15.1)
LDL Cholesterol (n = 170)	120.31 ± 43.85	120.5 (17-239)
Triglycerides (n = 170)	151.26 ± 96.10	125 (35-668)

DISCUSSION

This study reveals that the majority of stroke patients at Gotong Royong Hospital are male (58%), consistent with previous research indicating that men are more frequently affected by stroke.[13–15] While men have a higher incidence of stroke, women tend to experience worse outcomes and higher mortality rates post-stroke. Women show higher 1 and 10-year mortality and recurrence rates and tend to have less favorable outcomes within the first year after a stroke.[16] Additionally, women often present with greater disability and worse long-term outcomes, partly due to more severe initial neurological symptoms and higher susceptibility to neurological deterioration.[17] Risk factors also differ by sex, with men are more likely to have modifiable risk factors such as smoking, alcohol consumption, and dyslipidemia, which contribute significantly to stroke recurrence in males.[18,19] Conversely, women are more likely to have hypertension, diabetes, and atrial fibrillation, which are associated with higher stroke severity and worse outcomes.[19,20]

Our study also shows that most stroke patients are over 70 years old (31.7%), followed by those aged 51-60 years (29%) and 61-70 years (26.3%). This finding differs from previous studies, which indicated that the 61-70 age group had the highest incidence of stroke.[14,21,22] Research indicates that most strokes occur in older adults, with 75% affecting individuals aged 65 and above, and those over 75 experiencing higher hospitalization and mortality rates.[23] Arterial stiffness and carotid intima-media thickness, indicators of vascular health, are more pronounced in middle-aged stroke patients compared to younger ones, further complicating the clinical picture as age advances.[24]

The data indicates that ischemic stroke is overwhelmingly the most common type of stroke, affecting 205 patients (91.5%), while hemorrhagic stroke affects only 19 patients (8.5%). This finding is consistent with previous research conducted by Stevano et al. in Jakarta, which showed that ischemic stroke comprised the majority (89.4%) of stroke cases treated in hospitals.[25] The Global

Burden of Disease (GBD) 2017 study further highlighted that in 2017, there were 11.9 million incident strokes, with ischemic stroke constituting 65%, primary intracerebral hemorrhage 26%, and subarachnoid hemorrhage 9%.[26]

In this study, most stroke patients (40.2%) presented to the emergency department more than 24 hours after stroke onset, followed by 21.8% who arrived within 4.5 hours of onset. Among ischemic stroke patients, 42.93% presented more than 24 hours after onset, with only 19.02% arriving within the golden period. Various studies have highlighted the proportion of patients arriving within this timeframe. For instance, a study at Yale-New Haven Hospital from 2010-2020 found that 37.5% of ischemic stroke patients presented early, within 4.5 hours.[27] The Get With The Guidelines–Stroke database analysis indicated that 28.3% of ischemic stroke patients arrived within 60 minutes, and 31.7% within 61 to 180 minutes, highlighting the importance of early arrival for better outcomes.[28] Additionally, a study on the impact of family knowledge on stroke management found that 58.2% of respondents with high knowledge levels brought patients to the hospital within the golden period.[29]

The study also shows that more than half of the stroke patients had a history of hypertension (68.8%). Diabetes mellitus was present in 36.6% of patients, and dyslipidemia in 24.1%. A study by Thrinetrapriya in 2021 showed that 70% of stroke patients had comorbid hypertension, consistent with our findings. That study also reported that 48% of patients had diabetes mellitus and 38% had dyslipidemia, while our study shows a higher percentage of patients with comorbid dyslipidemia compared to diabetes mellitus.[14]

The initial blood pressure examination of stroke patients in the emergency department revealed that the majority exhibited Grade 2 hypertension, followed by Grade 1 hypertension in systolic blood pressure. In terms of diastolic blood pressure, prehypertension was most common, followed by Grade 2 hypertension. Only 8.48% and 14.29% of patients had normal systolic and diastolic blood pressures, respectively. The mean systolic and diastolic blood pressures in this study were similar to those reported by Retnaningsih, with mean values of 150.97 ± 22.97 mmHg for systolic and 86.86 ± 13.30 mmHg for diastolic blood pressure.[30] Previous study by Dinata also found that only 8.33% of stroke patients presenting to the emergency department had normal blood pressure.[31] Elevated blood pressure is common immediately following acute ischemic stroke (AIS), likely due to a physiological response to neurological insult and cerebral autoregulation failure.[32]

The mean random blood glucose (174.3 ± 102.96 mg/dL) and fasting blood glucose (110.42 ± 35.46 mg/dL) levels did not show significant elevations among the patients. However, the mean HbA1C level was elevated (8.06 ± 2.59%). Research indicates that diabetes significantly increases the risk of stroke, with higher fasting glucose levels correlating with a greater incidence of stroke events.[33] HbA1C, reflecting long-term glycemic control, has been associated with stroke severity and infarct volume, with higher levels correlating with more severe strokes and larger infarct sizes.[34] Additionally, HbA1C levels are crucial in identifying undiagnosed diabetes or prediabetes in stroke patients.[35] Both fasting glucose and HbA1C levels are associated with intracranial atherosclerotic stenosis (ICAS), a common cause of stroke, indicating that elevated levels of these glycemic measures increase the risk of ICAS.[36]

The mean LDL cholesterol level in this study was 120.31 ± 43.85 mg/dL, while triglycerides had a mean of 151.26 ± 96.10 mg/dL. LDL cholesterol, which transports cholesterol to cells, is known as a primary atherogenic lipoprotein when oxidized, significantly increasing the risk of atherosclerosis. Previous studies have highlighted the significance of serum LDL cholesterol levels in the context of ischemic stroke, with elevated LDL cholesterol being associated with an increased risk of ischemic stroke[37–39]. Additionally, Kanagarajan et al. (2020) reported a direct association between increased triglyceride levels and ischemic stroke risk, emphasizing the role of triglycerides as a potential risk factor for stroke.[39] A report by Yaghi et al. found that total cholesterol and LDL levels have the strongest association with ischemic stroke occurrence.[40]

CONCLUSION

This study shows that the majority of acute stroke patients at Gotong Royong Hospital are male, over the age of 60, present with ischemic stroke, and arrive at the emergency department more than 24 hours after the onset of symptoms. These patients commonly have a history of hypertension, but no previous history of stroke, with an average length of stay of 4 days. Many patients exhibit Grade 2 hypertension in systolic blood pressure and prehypertension in diastolic blood pressure.

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