

CHARACTERISTICS OF STROKE PATIENTS AT HANAFIAH BATUSANGKAR GENERAL HOSPITAL, WEST SUMATERA ON 2019-2024

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To Cite This Article: Atikah, R., Baringbing, S. M., & Eriyanti, L. (2025). CHARACTERISTICS OF STROKE PATIENTS AT HANAFIAH BATUSANGKAR GENERAL HOSPITAL, WEST SUMATERA ON 2019-2024. Journal of Advanced Research in Medical and Health Science (ISSN 2208-2425), 11(5), 1-5. <https://doi.org/10.61841/gefyne41>

ABSTRACT

Stroke is a significant global health issue, with increasing prevalence due to the aging population. In Indonesia, stroke is more common among men and urban populations. Modifiable risk factors, such as hypertension, diabetes, and dyslipidemia, are the leading causes of stroke, particularly ischemic stroke. This study aimed to describe the characteristics of stroke patients at RSUD Hanafiah Batusangkar during the 2020-2024 period, focusing on risk factors, stroke types, and clinical outcomes. The results showed that ischemic stroke was the most common type, followed by hemorrhagic stroke. Hypertension and type II diabetes mellitus were the main comorbidities. The survival rate was 89.47%, with a mortality rate of 10.53%. This study emphasizes the importance of managing risk factors and stroke prevention through screening, as well as improving acute care and optimizing rehabilitation programs.

Keywords: Stroke, hypertension, diabetes mellitus, ischemic, hemorrhagic, rehabilitation, risk factors.

INTRODUCTION

Stroke is a severe global health issue and remains as one of the leading causes of mortality and disability worldwide. In the United States, stroke ranks as the fifth leading cause of death and the primary cause of long-term disability among adults, with approximately 795,000 stroke cases annually.^{1,2} The increasing aging population and declining stroke fatality rates have contributed to a rising prevalence of stroke, which is projected to increase by approximately 3.4 million cases between 2012 and 2030. Although stroke-related mortality has decreased over the last two decades, recent trends suggest a potential resurgence, which may be closely associated with the obesity epidemic and related conditions such as diabetes. Stroke has led to an enormous financial burden with an estimated annual cost exceeding \$34 billion, encompassing healthcare services, treatment, and losses due to work absences.^{2,3}

Globally, stroke is the fourth leading cause of death, with a higher burden in low- and middle-income countries. More than 81% of stroke-related deaths happen in low-income countries, where the prevalence is conspicuously higher when compared to high-income countries. In Indonesia, the prevalence of stroke increases with age and is more common in men than women. Additionally, urban populations exhibit a higher prevalence of stroke compared to suburban and rural areas.^{4,5}

Stroke risk factors can be largely classified into non-modifiable and modifiable categories (such as age and sex). Modifiable risk factors, including hypertension, hyperlipidemia, diabetes mellitus, obesity, smoking, and physical inactivity play a significant role in stroke occurrence, particularly ischemic stroke. Hypertension, particularly, is the most prominent risk factor, followed by high cholesterol levels and diabetes mellitus. In settings like so, effective management of these risk factors is imperative for stroke prevention and control.⁶⁻⁸

Furthermore, growing evidence suggests that subclinical cerebrovascular disease, including silent infarctions and ischemic white matter disease, may potentially lead to cognitive decline, dementia, and other functional impairments. This indicates that the burden of stroke extends beyond clinically relevant events, and influences long-term impacts that significantly affects patients' quality of life.^{2,3}

This study aims to dig in deeper into stroke epidemiology, associated risk factors, and patient outcomes to enhance the understanding of effective prevention and provide better management strategies. The findings are expected to contribute towards health policy development, particularly in low- and middle-income countries like Indonesia, to reduce stroke incidence and mortality.⁹

In this context, research on stroke patient characteristics is pivotal to understand epidemiological patterns, risk factors, and clinical outcomes. At Hanafiah Batusangkar Regional Hospital in West Sumatra, recent studies on stroke patient characteristics from 2020 to 2024 remain limited. This study aims to describe patient profiles, including primary risk factors such as hypertension and other comorbidities, stroke subtypes, and clinical outcomes in terms of disability, mortality, or recovery. The findings are expected to contribute to the development of more effective stroke prevention and management strategy, which in the long run improves patient quality of life.

METHODS

This study is a descriptive study performed retrospectively at Hanafiah Batusangkar Regional Hospital, West Sumatra. The data used in this study were obtained from the medical records of patients diagnosed with stroke at Hanafiah Batusangkar Regional Hospital during the 2019–2024 period that fulfils our inclusion and exclusion criteria. The minimum required sample size was 58 patients, with data collection performed using secondary data sources. The collected data were processed and analyzed using univariate analysis to describe the distribution of stroke patient characteristics, including age, sex, type of hemorrhage, hemorrhage location, and risk factors such as hypertension, diabetes mellitus (DM), and dyslipidemia.

RESULTS

Based on the presented data, a total of 2,084 patients were included, with a nearly balanced gender distribution comprising of 51% male (1,062 patients) and 49% female (1,022 patients). The most frequently diagnosed stroke subtype was ischemic stroke, accounting for 64.51% of all cases, followed by hemorrhagic stroke (15.50%), embolic/cardioembolic stroke (4.80%), unspecified stroke (4.08%), and other stroke diagnoses (11.12%).

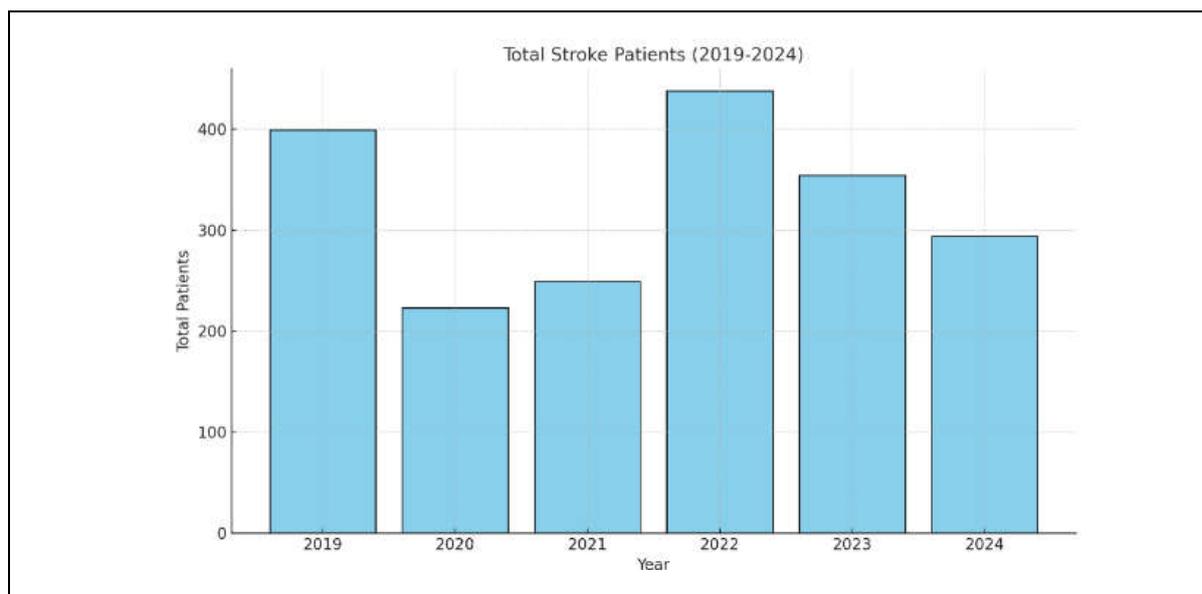
Age distribution found that most patients were among the 60–69-years old age range (33.25%), followed by the 70–79-year age group (24.62%). The proportions of patients younger than 50 years and those aged ≥ 80 years were lower, at 9.50% and 10.00%, respectively. In regards to the clinical outcomes, the majority of patients (89.47%) survived, while the mortality rate was found to be 10.53%.

The most frequent secondary diagnosis associated with stroke cases was hypertension (36.42%), followed by hemiparesis/hemiplegia (15.64%) and type 2 diabetes mellitus (10.80%). The most commonly seen differential diagnoses included hypertension (12.47%), dyslipidemia (7.58%), and electrolyte imbalances such as hypokalemia/hypocalcemia (6.14%). Overall, the majority of patients survived and were discharged from the hospital (82.63%), whereas 17.37% died during hospitalization.

These findings underline the importance of early detection and management of modifiable risk factors such as hypertension and dyslipidemia to improve stroke prognosis, particularly among the elderly, who currently holds the highest prevalence. Furthermore, multidisciplinary care and rehabilitation programs should be optimized to provide better patient outcomes.

Table 1. Data of Stroke Patients from 2019-2024

Parameters	Category	n	percentages (%)
Sex	Males (M)	1062	51%
	Females (F)	1022	49%
	Total	2084	100.00
Primary Diagnosis	Ischemic Stroke	1344	64.5%
	Hemorrhagic Stroke	323	15.5%
	Unspecified Stroke	85	4.08%
	Cardioemboli/Emboli Stroke	100	4.80%
	Other	232	11.1%
Age	<50 years old	198	9.5%
	50–59 years old	472	22.7%
	60–69 years old	693	33.2%
	70–79 years old	513	24.6%
	≥80 years old	208	10%
Patient Output	Survived	1865	89.5%
	Deceased	219	10.5%
3 Main Secondary Diagnosis	Hypertension	759	36.4%
	Hemiparesis/Hemiplegia	326	15.6%
	Type II Diabetes Mellitus	225	10.8%
3 Main Differential Diagnosis	Hypertension	260	12.5%
	Dyslipidemia	158	7.6%
	Hypokalemia/Hypocalcemia	128	6.1%
Clinical Outcomes	Survived & Discharged	1722	82.6%
	Deceased during Hospitalization	362	17.4%



Graph of the Total of Stroke Patients from 2019-2024

DISCUSSION

This study analyzes the characteristics of stroke patients hospitalized at Hanafiah Batusangkar General Hospital, West Sumatra, between 2019 and 2024, providing critical insights into the local epidemiology of this pertaining health condition. A total of 2,084 stroke patients were included, with a nearly equal gender distribution: 51% male and 49% female. Findings found contradict results of several studies which reported a male predominance in stroke incidence. However, the relationship between sex and stroke risk is complex and influenced by age. Females tend to have a higher risk of stroke at a younger age due to unique factors including pregnancy, hormonal fluctuations, and other conditions such as preeclampsia. Over a longer lifespan, women experience more strokes than men, primarily due to their higher life expectancy in comparison to the opposite sex.

The most common stroke subtype was ischemic stroke, accounting for 64.51% of cases. This finding aligns with global data indicating that ischemic stroke comprises approximately 80% of all strokes.² Other stroke subtypes showed varying proportions: hemorrhagic stroke (15.50%), embolic/cardioembolic stroke (4.80%), unspecified stroke (4.08%), and other stroke diagnoses (11.12%). These variations highlight the importance of regional studies, as the burden of stroke subtypes may differ due to healthcare accessibility, comorbidity prevalence, and genetic predisposition. It is notable that ischemic stroke may be further classified into subtypes such as cardioembolic, atherosclerotic, and lacunar strokes, each with their own key risk factors. Although this classification is beyond the scope of this study, it remains essential for targeted interventions.

The age distribution of patients in this study revealed that the majority of patients were in the 60–69-year age group (33.25%), followed by the 70–79-year age group (24.62%). This finding supports the previously established understanding that stroke risk increases with age, with the incidence rate doubling every decade after 55 years of age. Although the proportion of stroke cases was lower among younger individuals (<50 years, 9.50%) and the oldest age group (≥80 years, 10.00%), the increasing trend of ischemic stroke incidence in younger populations (20–54 years), as noted in global literature, raises concerns and necessitates more investigation among this particular population.^{4,10}

Clinical outcomes showed an overall survival rate of 89.47%, with a mortality rate of 10.53%. However, in-hospital mortality was higher at 17.37%, highlighting the severity of acute stroke and the urgent need for improved stroke emergency care. These findings intensify the importance of primary prevention towards modifiable risk factors and the need for enhanced acute stroke management strategies.¹¹

The primary comorbidities identified included hypertension (36.42%), hemiparesis/hemiplegia (15.64%), and type 2 diabetes mellitus (10.80%). Hypertension, identified as the most significant and modifiable stroke risk factor, has a strong, direct, and continuous association with stroke risk. The INTERSTROKE study has also toughened the role of hypertension as the main contributor to stroke globally. The soaring prevalence of hypertension in this study emphasizes the urgent need for community-based screening, management, and control programs. Similarly, diabetes mellitus, which is known to double the risk of stroke and is associated with poorer outcomes, underscores the importance of diabetes prevention and management in reducing the stroke burden. Dyslipidemia, recorded in 7.58% of cases, further fortifies the necessity of lipid management for its effects on ischemic and hemorrhagic stroke risk differ.^{13,14}

Although this study did not assess all potential risk factors, literatures worldwide highlights the significance of modifiable risks such as smoking, alcohol consumption, sedentary lifestyle, and obesity. For instance, smoking has a strong association with both ischemic and hemorrhagic strokes, whereas excessive alcohol consumption is linearly associated with an increased risk of hemorrhagic stroke. More attention towards emerging risk factors, including inflammation and infections should be given in future research to better understand their contribution to stroke risk.¹³⁻¹⁵

In conclusion, this study provides essential understanding into the epidemiological profile of stroke patients at Hanafiah Batusangkar General Hospital. The findings highlight the predominance of ischemic stroke, as well as its strong association with hypertension, diabetes, and aging as a major non-modifiable risk factor. Integrating these results with larger evidence indicates the need for a comprehensive approach to stroke prevention and management. This includes primary prevention through lifestyle modification and risk factor control, improvements in acute stroke care, and post-stroke rehabilitation services.¹⁷⁻²⁰ Future research should explore additional modifiable risk factors, such as atrial fibrillation and inflammatory markers, and evaluate the long-term impact of implemented interventions. Longitudinal studies are important to measure progress in reducing the stroke burden, guiding policies, and improving overall health outcomes.

CONCLUSION

This study provides essential visualizations into the characteristics of stroke patients at Hanafiah Batusangkar General Hospital during the 2019–2024 period. Ischemic stroke was identified as the most common subtype, accounting for more than half of all cases, with hypertension and type 2 diabetes mellitus as the primary comorbidities. Age was found to be a non-modifiable risk factor, with the highest incidence observed in the 60–69-year age group.

These findings emphasize the need for a multifaceted approach to stroke prevention and management. Primary prevention efforts particularly regarding hypertension and diabetes, promoting healthy lifestyles, and addressing other modifiable

risk factors such as dyslipidemia, smoking, and alcohol consumption should be made priority. Additionally, improvements in acute stroke care and rehabilitation services may enhance survival rates and post-stroke quality of life.

Future research should explore additional risk factors, such as atrial fibrillation and the role of inflammation in stroke occurrence, while assessing the long-term impact of implemented prevention and management programs on stroke morbidity and mortality in the long term. This data-driven approach aims to substantially contribute to reducing the stroke burden within the local population.

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