International Journal of Research in Medical Sciences
Rameshbhai PH et al. Int J Res Med Sci. 2025 Oct;13(10):4152-4158
www.msjonline.org pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20253157

Original Research Article

Hyperglycemia as a predictor of stroke severity and prognosis: evaluating short-term outcomes in acute stroke patients

Rameshbhai Hirenbhai Patel[1], Maliha S. Shaikh[2], Nihalkumar Pravinbhai Patel[3]*

[1]Department of General Medicine, GMERS Medical College and Hospital, Dharpur, Patan, Gujarat, India
[2]Resident Medical Officer, Intensive Care Unit, Yashfeen Cardiac Hospital, Surat, Gujarat, India
[3]Department of Chemistry, Faculty of Science, Ganpat University, Mehsana, Gujarat, India

Received: 04 July 2025
Revised: 07 August 2025
Accepted: 11 September 2025

***Correspondence:**
Dr. Nihalkumar Pravinbhai Patel,
E-mail: nihalpatel1610@gmail.com

ABSTRACT

Background: One of the leading causes of mortality and disability worldwide is stroke, with its burden increasing significantly, particularly in low- and middle-income countries (LMICs). Hyperglycemia independent of diabetic status has been correlated with a poor outcome after a stroke in severity, poor nervous system recovery, and mortality. However, the extent to which stress hyperglycemia independently impacts stroke prognosis remains debated. This study aimed to evaluate the relationship between glycemic status at admission and stroke severity, short-term neurological recovery, and mortality outcomes. Additionally, we assess whether random blood sugar (RBS) or glycated hemoglobin (HbA1c) correlates more strongly with stroke severity.

Methods: A hospital-based observational study was conducted on 80 acute stroke patients. Patients were categorized into euglycemic, diabetic, prediabetic, and stress hyperglycemic groups based on admission RBS and HbA1c levels. Stroke severity was assessed using the NIH Stroke Scale (NIHSS) on day 1 and day 7. The primary outcome was neurological recovery, and the secondary outcome was 7-day mortality.

Results: Hyperglycemia was significantly associated with higher NIHSS scores at admission and poorer recovery at day 7 ($p<0.01$). The mortality rate was highest in diabetic and stress hyperglycemic patients (20% each, $p<0.01$). A stronger correlation was found between RBS and stroke severity ($r=0.81$) than HbA1c ($r=0.52$).

Conclusions: Acute hyperglycemia is an independent predictor of stroke severity and poor short-term outcomes, emphasizing the need for early glucose monitoring and targeted intervention in stroke patients.

Keywords: Glycemic control, Hyperglycemia, Mortality, NIH Stroke Scale, Stroke severity

INTRODUCTION

Stroke remains a major global health concern, contributing to approximately 11.6% of all deaths worldwide, being the second leading cause of mortality. The global age-standardized prevalence of stroke has increased over the past decade, with recent estimates indicating a rise from 2.7% (2011-2013) to 2.9% (2020-2022) in the United States, reflecting a 7.8% overall increase.[1,2] In India, the crude prevalence of stroke varies widely, ranging from 44.29 to 559 per 100,000 persons, with incidence rates reported between 105 and 152 per 100,000 persons annually.[3,4] While stroke incidence has declined in high-income countries, it has risen sharply in low- and middle-income countries (LMICs), further exacerbating healthcare challenges. Beyond mortality, stroke remains a leading cause of long-term disability, with more than half of survivors aged over 65 experiencing reduced mobility post-stroke.[5,6] These trends highlight the urgent need for effective prevention, early detection, and optimized management strategies to mitigate the growing burden of stroke.

The role of hyperglycemia in stroke pathophysiology has gained increasing attention due to its association with larger infarct volumes, increased hemorrhagic transformation risk, and poor functional recovery.[7,8] Research has demonstrated that patients with acute hyperglycemia exhibit a 3-4 times higher risk of poor neurological outcomes, even after accounting for other vascular risk factors.[9] Despite this, glycemic management in acute stroke remains controversial, with no universally accepted glucose control protocols in stroke care.[10] While some studies advocate for tight glycemic control to prevent secondary complications, others warn against aggressive glucose-lowering strategies due to the risk of hypoglycemia-induced cerebral injury.[11,12] This ongoing debate underscores the need for further studies exploring the optimal glycemic threshold and its direct impact on short-term and long-term stroke outcomes.

In this study, we aimed to assess the impact of glycemic status at admission on stroke severity, neurological recovery, and short-term mortality. By classifying patients into euglycemic, diabetic, prediabetic, and stress hyperglycemic groups, we seek to determine whether hyperglycemia independently predicts poorer clinical outcomes and its correlation with stroke prognosis.

METHODS

Study design

This observational study was conducted at Aditya Diagnostics and Hospitals, Dibrugarh, Assam, over a period of one year from November 1, 2019, to October 31, 2020. All patients included in the study were diagnosed with acute stroke and admitted within 24 hours of symptom onset.

Objectives

The primary objective of the study was to assess the relationship between glycemic status at admission and stroke severity as measured by the NIHSS score at presentation and at day 7 of hospitalization. The study also aimed to determine whether hyperglycemia, including stress hyperglycemia, was an independent predictor of poor functional recovery and mortality in stroke patients. Secondary objectives included evaluating the impact of glycemic control on short-term clinical outcomes and determining whether a correlation existed between HbA1c levels and stroke severity.

Study population and selection criteria

The study included 80 consecutive patients admitted with a confirmed diagnosis of acute stroke.

Inclusion criteria

Patients with a history of acute stroke presenting within 24 hours of symptom onset, with the diagnosis established based on the World Health Organization (WHO) definition of stroke, were included in the study. Only those with radiologically confirmed stroke on CT or MRI brain imaging were considered eligible. Additionally, informed consent was obtained from all patients or their legal representatives before participation.

Exclusion criteria

Patients with a history of traumatic brain injury, transient ischemic attack (TIA), or any additional pathological findings on neuroimaging other than stroke were excluded. Those admitted beyond 24 hours of symptom onset were not considered for inclusion. Other exclusion criteria included patients with known hemoglobinopathies, those undergoing hemodialysis, individuals who had received a blood transfusion within the last three months, and those on erythropoietin therapy. Patients who had received intravenous dextrose before or during blood sample collection were also excluded to avoid confounding in glycemic assessment. Additionally, individuals discharged before completing seven days of hospitalization were not included to ensure adequate follow-up for assessing short-term stroke outcomes.

Data collection and outcome measures

Upon admission, detailed patient history, demographic details, and clinical data were recorded. Medical history, including prior stroke, hypertension, diabetes mellitus, cardiovascular diseases, smoking, alcohol consumption, and medication use, was documented. Neurological examination findings were assessed, and baseline stroke severity was determined using the NIHSS score.[13] Blood samples were collected at admission to measure random blood sugar (RBS) and glycated hemoglobin (HbA1c). Based on their glycemic status, patients were categorized into four groups: euglycemia, diabetes mellitus, prediabetes, and stress hyperglycemia.[14] Stroke outcomes were assessed using NIHSS scores on admission (day 1) and at day 7 to evaluate changes in neurological function. Mortality rates during the first seven days of hospitalization were also recorded as a secondary outcome.

Statistical analysis

All statistical analyses were performed using SPSS version 21. Continuous variables were expressed as mean±standard deviation (SD), while categorical variables were presented as percentages. Normality of data distribution was assessed using the Kolmogorov-Smirnov test. Comparisons between groups were conducted using independent t-tests or Mann-Whitney U tests for continuous variables, depending on normality. Categorical variables were analyzed using the Chi-square test. Correlations between glycemic markers (RBS and HbA1c) and stroke severity (NIHSS scores) were determined using Pearson's or Spearman's correlation coefficients. A p value of <0.05 was considered statistically significant for all analyses.

Ethical considerations

This study was conducted in accordance with the principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the institutional ethics committee of Aditya Diagnostics and Hospitals, Dibrugarh, Assam. Informed consent was obtained from all patients before enrolment in the study.

RESULTS

The study included 80 patients diagnosed with mean age of 59.16±8.91 years, with 51.3% were aged over 60 years. Based on CT/MRI imaging findings, ischemic stroke was the most common subtype, accounting for 76.2% of cases. Stroke severity, assessed using the NIH Stroke Scale (NIHSS) at admission, showed that moderate stroke (NIHSS 5-15) was the most frequent presentation, followed by severe stroke (NIHSS 21-42). Among the associated risk factors, smoking was the most prevalent, followed by dyslipidemia and hypertension. Regarding glycemic status at admission, 35.0% of patients were euglycemic, while 31.3% were diabetics, 21.3% had prediabetes, and 12.5% exhibited stress hyperglycemia (Table 1).

Glycemic status and stroke outcomes

Association of glycemic status with stroke type and severity

The relationship between glycemic status and stroke type did not show a significant association (p=0.93) (Table 2), as ischemic stroke was more prevalent across all glycemic categories, irrespective of blood glucose levels at admission. However, stroke severity at presentation, assessed using the NIH Stroke Scale (NIHSS) on day 1, showed a strong association with glycemic status (Table 3). Diabetic and stress hyperglycemic patients had significantly higher NIHSS scores, indicating more severe strokes at admission, whereas euglycemic and prediabetic patients had comparatively lower NIHSS scores, suggesting milder presentations.

Table 1: Patients baseline demographic and clinical parameters.

Parameters	Frequency (%)
Total patients	80 (100)
Male	54 (67.5)
Female	26 (32.5)
Age years, Mean±SD	59.16±8.91
≤40	4 (5.0)
41-50	11 (13.8)
51-60	24 (30.0)
61-70	32 (40.0)
>70	9 (11.3)
Type of stroke	
Ischemic stroke	61 (76.2)
Hemorrhagic stroke	19 (23.8)
Associated risk factors	
Diabetes	25 (31.3)
Hypertension	30 (37.5)
Dyslipidemia	38 (47.5)
Alcoholic	31 (38.8)
Atrial fibrillation	7 (8.8)
Ischemic heart disease (IHD)	14 (17.5)
Smoker	41 (51.3)
Severity of stroke (As per NHSS)	
Mild Stroke (NIHSS 1-4)	4 (5.0)
Moderate Stroke (NIHSS 5-15)	42 (52.5)
Moderate to severe stroke (NIHSS 16-20)	7 (8.8)
Severe stroke (NIHSS 21-42)	27 (33.8)
Glycemic status	
Euglycemic	28 (35.0)
Diabetics	25 (31.3)
Pre-diabetics	17 (21.3)
Stress hyperglycemia	10 (12.5)

Table 2: Association of glycemic status with stroke type and severity.

Glycemic group	Ischemic stroke (%)	Hemorrhagic stroke (%)	P value (stroke type)	NIHSS day 1 mean±SD	P value (severity)
Euglycemic	21 (75.0)	7 (25.0)	0.93	15.5±5.7	<0.01
Diabetic	20 (80.0)	5 (20.0)		24.5±9.75	
Prediabetic	13 (76.5)	4 (23.5)		16.2±6.64	
Stress hyperglycemic	7 (70.0)	3 (30.0)		22.0±7.23	

Table 3: Change in stroke severity over 7 days based on glycemic status and stroke type.

Glycemic group	Stroke type	NIHSS day 1 (Mean±SD)	NIHSS day 7 (Mean±SD)	t-value	P value
Euglycemic	Overall	15.5±5.7	11.1±4.4	9.2	<0.01
Diabetic		22.3±8.5	20.5±9.6	2.5	0.37
Prediabetic		16.2±6.6	12.8±5.2	5.1	<0.01
Stress hyperglycemic		20.8±7.7	18.7±7.4	2.2	0.29
Euglycemic	Ischemic	15.0±6.8	10.5±5.0	8.3	<0.01
Diabetic		21.4±1.5	18.8±1.7	2.9	0.09
Prediabetic		15.3±8.7	11.6±7.0	4.1	<0.01
Stress hyperglycemic		20.6±1.4	18.6±2.1	2.3	0.26
Euglycemic	Hemorrhagic	16.8±5.4	12.8±4.3	3.98	<0.01
Diabetic		27.6±7.5	26.6±9.0	0.55	0.63
Prediabetic		19.2±6.1	16.3±4.8	3.04	0.03
Stress hyperglycemic		21.5±8.6	19.0±7.4	1.93	0.18

Table 4: Incidence of severe stroke across glycemic groups.

Glycemic group	Severe stroke (overall) (%)	Severe ischemic stroke (%)	Severe hemorrhagic stroke (%)	P value
Euglycemic	2 (7.1)	1 (4.8)	1 (14.3)	<0.01
Diabetic	15 (60.0)	10 (50.0)	5 (100.0)	
Prediabetic	5 (29.4)	3 (23.1)	2 (50.0)	
Stress hyperglycemic	5 (50.0)	4 (57.0)	1 (33.0)	

Change in stroke severity over 7 days based on glycemic status

Stroke severity, assessed using the NIH Stroke Scale (NIHSS) on day 1 and day 7, showed a significant improvement in euglycemic and prediabetic patients compared to those with diabetes or stress hyperglycemia. In overall stroke cases, the NIHSS scores significantly decreased in euglycemic ($p<0.01$) and prediabetic ($p<0.01$) groups, whereas the change was not statistically significant in diabetics ($p=0.37$) and stress hyperglycemic patients ($p=0.29$). A similar pattern was observed in ischemic stroke cases, where euglycemic and prediabetic patients exhibited substantial neurological improvement ($p<0.01$), while diabetic and stress hyperglycemic patients showed minimal recovery ($p>0.05$). Among hemorrhagic stroke cases, euglycemic and prediabetic groups showed a significant reduction in NIHSS scores ($p<0.01$ and $p=0.03$, respectively), while diabetic and stress hyperglycemic patients demonstrated poor recovery with no significant improvement in NIHSS scores ($p=0.63$ and $p=0.18$, respectively) (Table 3).

Stroke severity and mortality based on glycemic status

Severe stroke was significantly more common among diabetic and stress hyperglycemic patients, with 60.0% and 50.0% of cases classified as severe stroke, respectively ($p<0.01$). In contrast, euglycemic patients had the lowest incidence of severe stroke (7.1%). This trend was consistent across ischemic and hemorrhagic stroke cases, where hyperglycemic patients demonstrated higher rates of severe stroke compared to euglycemic individuals (Table 4). Out of 80 patients, 7 (8.8%) died within the first seven days of hospitalization, with diabetic and stress hyperglycemic patients experiencing the highest mortality rates (20.0%) (Figure 1).

Correlation analysis

Correlation of glycemic markers with stroke severity

A significant positive correlation was observed between NIHSS scores and glycemic markers, with HbA1c ($r=0.52$, $p<0.01$) and RBS ($r=0.81$, $p=0.02$) showing strong associations (Figure 2a and 2b). This indicates that higher admission glucose levels correlate with greater stroke severity, reinforcing the role of hyperglycemia as a predictor of poor neurological outcomes.

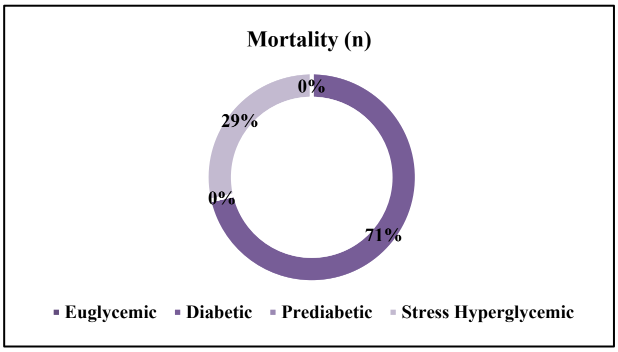

Figure 1: Association of glycemic status with mortality in stroke patients.

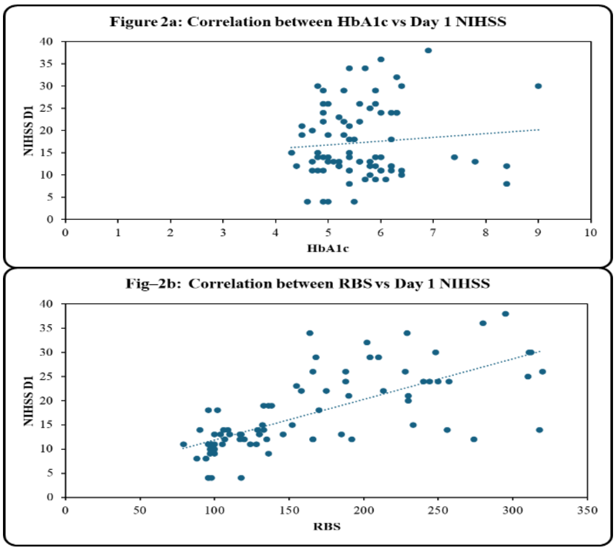

Figure 2: a) correlation between HbA1c levels and NIHSS scores on day 1; b) correlation between random blood sugar (RBS) and NIHSS scores on day 1.

Gender and stroke type correlation

Analysis of gender distribution across stroke types showed that ischemic stroke was more prevalent in both males and females. However, hemorrhagic stroke was significantly more common in males (32%) compared to females (8%) ($p<0.01$), suggesting a possible gender-related risk difference (Table 5).

Table 5: Association of gender with type of stroke.

Gender	Types of stroke		Total
	Ischemic (n=61) (%)	Hemorrhagic (n=19) (%)	(n=80)
Male	37 (68)	17 (32)	54 (67.5)
Female	24 (92)	02 (08)	26 (32.5)

NIHSS scores across glycemic groups

Mean NIHSS scores at admission (day 1) were highest in diabetic (24.5±8.7) and stress hyperglycemic (22.0±7.2) patients, while euglycemic and prediabetic patients had significantly lower scores ($p<0.05$) (Table 6). This trend remained consistent when comparing RBS and HbA1c levels with stroke severity, further supporting the impact of glycemic control on stroke prognosis.

Table 6: Correlation of random blood sugar and glycated hemoglobin levels with severity of stroke.

Severity of stroke on admission	Mean RBS	Mean HbA1c
Mild (1-4)	127±48.0	4.9±0.37
Moderate (5-15)/ moderate to severe (16-20)	144±52.3	5.7±0.91
Severe (21-42)	206±52.7	7.4±0.88

DISCUSSION

This study demonstrated that hyperglycemia at stroke admission is significantly associated with greater stroke severity, poor neurological recovery, and increased short-term mortality risk. These findings align with previous literature, where stress hyperglycemia and diabetes have been identified as independent predictors of adverse stroke outcomes. Multiple studies, including those by Das et al, Al-Weshahy et al, and Zewde et al, support the notion that elevated blood glucose levels correlate with higher NIHSS scores, larger infarct size, and worse functional recovery.[15-17] The stronger correlation between random blood sugar ($r=0.81$, $p=0.02$) and stroke severity compared to HbA1c ($r=0.52$, $p<0.01$) in this study suggests that acute hyperglycemia, rather than chronic glycemic burden, plays a more dominant role in determining initial stroke severity. This reinforces the concept that stress hyperglycemia is a dynamic response to acute neurological injury rather than a mere marker of preexisting diabetes.

The higher mortality and severity of stroke in hyperglycemic patients can be attributed to multiple pathophysiological mechanisms. Hyperglycemia contributes to cerebral ischemic injury through oxidative stress, inflammatory cascades, endothelial dysfunction, and increased lactate production, all of which exacerbate infarct expansion and impair neurological recovery. Several studies, including those by Marulaiah et al, and Katarzyna et al, have identified stress hyperglycemia as a pro-inflammatory state, triggering hypercoagulability, blood-brain barrier disruption, and increased susceptibility to hemorrhagic transformation.[18,19] These mechanisms explain why diabetic and stress hyperglycemic patients in our study exhibited minimal neurological recovery over seven days, unlike their euglycemic and prediabetic counterparts who showed significant improvement.

Interestingly, while prior literature has debated whether hyperglycemia influences stroke outcomes independent of stroke severity, our findings suggest that admission glucose levels directly impact prognosis regardless of stroke subtype. Previous meta-analyses have suggested that ischemic stroke is more prevalent in hyperglycemic patients, but the adverse impact of hyperglycemia on hemorrhagic stroke has been less explored. Our study observed a disproportionately higher mortality rate (15.8%) in hemorrhagic stroke compared to 6.6% in ischemic stroke, similar to findings from Strong et al and Sridharan et al, where hemorrhagic stroke was linked to greater early-phase mortality due to higher intracranial pressure and increased risk of hematoma expansion in hyperglycemic patients. [20,21]

These findings highlight the clinical importance of tight glycemic control in acute stroke management. While existing guidelines focus on long-term diabetes management to prevent stroke, our data, along with those from Forti et al and Chinu et al, highlight the need for early, aggressive glucose monitoring and intervention during hospitalization.[22,23] The observed lack of NIHSS improvement in diabetic and stress hyperglycemic patients reinforces the importance of targeted glucose-lowering strategies in the acute phase.

This study establishes that admission hyperglycemia is a significant predictor of stroke severity, poor short-term recovery, and increased mortality, reinforcing the need for early glycemic management in acute stroke care. Being a single-center study with a moderate sample size, the findings may require validation in larger, multi-center cohorts to enhance generalizability. Additionally, the focus on short-term outcomes limits insights into long-term functional recovery. Future research should explore extended follow-up periods to assess sustained effects of hyperglycemia on stroke prognosis and investigate personalized glycemic control strategies to optimize neurological outcomes in acute stroke patients.

CONCLUSION

This study highlights the significant impact of hyperglycemia on stroke severity, neurological recovery, and short-term mortality. Patients with diabetes and stress hyperglycemia had higher NIHSS scores at admission, worse functional outcomes, and increased mortality rates compared to euglycemic and prediabetic patients. The strong correlation between random blood sugar and stroke severity underscores the importance of acute glucose control in stroke management. These findings emphasize the need for early glucose monitoring and targeted interventions to improve recovery.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Xu J, Hou S, Chen Z, Liu Y, Deng X, Wang C, Liu S, Wang Y. The burden of ischemic stroke in Eastern Europe from 1990 to 2021. BMC Neurol. 2025;25(1):74.
2. Yang R, Liu X, Zhao Z, Zhao Y, Jin X. Burden of neurological diseases in Asia, from 1990 to 2021 and its predicted level to 2045: a Global Burden of Disease study. BMC Public Health 2025;25:706.
3. Jones SP, Baqai K, Clegg A, Georgiou R, Harris C, Holland EJ, et al. Stroke in India: a systematic review of the incidence, prevalence, and case fatality. Int J Stroke. 2022;17(2):132-40.
4. Rangamani S, Huliyappa D, Kulothungan V, Saravanan S, Murugan PK, Mahadevan R, et al. Stroke incidence, mortality, subtypes in rural and urban populations in five geographic areas of India (2018-2019): Results from the National Stroke Registry Programme. Lancet Region Health-Southeast Asia. 2024;23.
5. Kamalakannan S, Gudlavalleti ASV, Gudlavalleti VSM, Goenka S, Kuper H. Incidence and prevalence of stroke in India. Indian J Med Res. 2017;146:175-85.
6. Kalita J, Bharadwaz MP, Aditi A. Prevalence, contributing factors, and economic implications of strokes among older adults: a study of north-east India. Sci Rep. 2023;13:16880.
7. Kagansky N, Levy S, Knobler H. The role of hyperglycemia in acute stroke. Arch Neurol. 2001;58:1209.
8. Kruyt ND, Biessels GJ, DeVries JH, Roos YB. Hyperglycemia in acute ischemic stroke: pathophysiology and clinical management. Nat Rev Neurol. 2010;6:145-55.
9. Kersten CJBA, Vrielink TH, den Hertog HM, Hofmeijer J, le Feber J. Effects of hyperglycemia on neuronal network function in an in vitro model of the ischemic penumbra. Brain Res. 2025;1849:149370.
10. McCormick MT, Muir KW, Gray CS, Walters MR. Management of hyperglycemia in acute stroke: how, when, and for whom? Stroke. 2008;39:2177-85.
11. Alexandrov AW, Palazzo P, Biby S, Doerr A, Dusenbury W, Young R, et al. Back to basics: adherence with guidelines for glucose and temperature control in an American comprehensive stroke center sample. J Neurosci Nurs. 2018;50(3):131-7.
12. Radermecker RP, Scheen AJ. Management of blood glucose in patients with stroke. Diabetes Metab. 2010;36:S94-9.
13. Josephson SA, Hills NK, Johnston SC. NIH Stroke Scale reliability in ratings from a large sample of clinicians. Cerebrovasc Dis. 2006;22:389-95.
14. Committee ADAPP, Committee: ADAPP. 2. Classification and diagnosis of diabetes: standards of medical care in diabetes- 2022. Diabetes Care. 2022;45:S17-38.

15. Das DPP. Glycemic status in acute stroke in relation to its severity and outcome. J Med Sci Clin Res. 2019;7.
16. Al-Weshahy A, El-Sherif R, Selim KAA-W, Heikal A. Short term outcome of patients with hyperglycemia and acute stroke. Egypt J Crit Care Med. 2017;5:93-8.
17. Zewde YZ, Mengesha AT, Gebreyes YF, Naess H. The frequency and impact of admission hyperglycemia on short term outcome of acute stroke patients admitted to Tikur Anbessa Specialized hospital, Addis Ababa, Ethiopia: a cross-sectional study. BMC Neurol. 2019;19:1-8.
18. Snarska KK, Bachórzewska-Gajewska H, Kapica-Topczewska K, Drozdowski W, Chorąży M, Kułakowska A, et al. Hyperglycemia and diabetes have different impacts on outcome of ischemic and hemorrhagic stroke. Arch Med Sci. 2017;13(1):100-8.
19. Marulaiah SK, Reddy MP, Basavegowda M, Ramaswamy PKH, Adarsh LS. Admission hyperglycemia an independent predictor of outcome in acute ischemic stroke: a longitudinal study from a tertiary care hospital in South India. Niger J Clin Pract. 2017;20:573-80.
20. Strong K, Mathers C, Bonita R. Preventing stroke: saving lives around the world. Lancet Neurol. 2007;6:182-7.
21. Sridharan SE, Unnikrishnan JP, Sukumaran S, Sylaja PN, Nayak SD, Sarma PS, et al. Incidence, types, risk factors, and outcome of stroke in a developing country: the Trivandrum Stroke Registry. Stroke. 2009;40(4):1212-8.
22. Forti P, Maioli F, Nativio V, Maestri L, Coveri M, Zoli M. Association of prestroke glycemic status with stroke mortality. BMJ Open Diabetes Res Care. 2020;8.
23. Chiu D, Peterson L, Elkind MS V, Rosand J, Gerber LM, Silverstein MD. Comparison of outcomes after intracerebral hemorrhage and ischemic stroke. J Stroke Cerebrovasc Dis. 2010;19:225-9.

Cite this article as: Patel RH, Shaikh MS, Patel NP. Hyperglycemia as a predictor of stroke severity and prognosis: evaluating short-term outcomes in acute stroke patients. Int J Res Med Sci 2025;13:4152-8.