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Study of Clinical Profile of Cerebrovascular Accident in Tertiary Care Hospital

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HIGHLIGHTS

- Study highlights varying severity among children.
- Risk factors significantly impact clinical outcomes.
- Pediatric admissions provide valuable clinical insights.
- Findings guide prevention and better management.

Key Words:
Cerebrovascular accident
Stroke
Clinical profile
Risk factors
Hypertension

ABSTRACT

Introduction: Cerebrovascular accident (CVA) or stroke is a leading cause of morbidity and mortality worldwide, significantly affecting quality of life and posing a heavy socioeconomic burden. The present study was undertaken to analyzed clinical profile of stroke patients admitted to a tertiary care hospital, with a focus on demographic characteristics, risk factors, and clinical presentations. **Material and Methods:** This observational prospective study was conducted in the Department of General Medicine, including all patients >18 years admitted with CVA between July 2023 and June 2025. Diagnosis was established using clinical and radiological criteria. Patients with trauma-related stroke, transient ischemic attacks, unstable hemodynamic status, pregnancy were excluded. Demographic data, risk factors, clinical features were systematically recorded and analyzed. **Results:** A total of 180 patients were studied. The majority were aged 61–75 years (77.78%), with males comprising 60% of cases. The most common presenting complaint was weakness (31.67%), followed by visual disturbances (15.56%) and seizures (12.22%). Gradual onset of symptoms was reported in 65% of patients, while 35% presented with sudden onset. A positive family history of CVA was observed in 48.33%, and personal risk factors included smoking (30.56%) and alcohol consumption (26.67%). Hypertension was the most prevalent comorbidity, with 67.78% of patients showing elevated blood pressure. Neurological evaluation revealed 69.44% of patients were disoriented, 26.11% had non-fluent or fluent aphasia, and significant motor weakness was noted in the majority, with 62.22% showing 0–2/5 power. **Conclusion:** The study highlights that CVA predominantly affects elderly males, with hypertension, smoking, alcohol consumption being key risk factors. Weakness and visual disturbances were the most common presenting features. Early identification of risk factors and timely intervention remain crucial for reducing stroke incidence and improving outcomes.

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Stroke, as defined by the World Health Organization in 1970, is "rapidly acquired clinical signs of focal (or global) disturbance of cerebral function, lasting more than 24 hours or resulting in death, with no apparent cause other than of vascular origin" [1]. In a cerebrovascular accident (CVA) or stroke, the brain suffers significant damage due to disrupted or markedly reduced blood flow, depriving brain cells of oxygen and essential nutrients. Without prompt restoration of circulation, brain cells begin to die within minutes, making stroke a potentially fatal medical emergency. While timely intervention can allow for partial or full recovery, untreated strokes may lead to permanent neurological deficits or death [2]. The National Institute of Neurological Disorders and Stroke characterizes a stroke as a "brain attack," occurring when a clot blocks blood flow or a blood vessel ruptures, emphasizing the principle that "time is brain," as delayed treatment results in greater neuronal loss [3].

Globally, strokes remain a significant public health concern, imposing substantial social and economic burdens. The World Stroke Organization (WSO) reports over 13.7 million strokes annually, with one in four adults over the age of 25 experiencing a stroke in their lifetime. More than 80 million people worldwide have survived a stroke, while 2.5 million die from it each year [4]. According to the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD), stroke claimed 5.5 million lives in 2016 and ranked as the second leading cause of disability-adjusted life years globally in 2021 for individuals aged 50–74 and 75 years and above [5]. Among the major risk factors, hypertension is the most prevalent and influential, as uncontrolled high blood pressure can damage blood vessels, increasing susceptibility to blockages or ruptures, which are the primary mechanisms of stroke. Age and gender also influence stroke risk, with older adults and males generally at higher risk. Smoking exacerbates vascular damage and promotes clot formation, while diabetes contributes by inducing vascular injury and increasing the likelihood of hypertension. Obesity, elevated cholesterol levels, sedentary lifestyle, poor nutrition, stress, and excessive alcohol consumption further increase stroke susceptibility [6].

Effective stroke prevention is crucial for improving individual health outcomes and reducing the broader socio-economic impact on healthcare systems. Preventive strategies include regular monitoring and management of hypertension, promotion of healthy lifestyle behaviors such as balanced diets and physical activity, smoking cessation, and control of chronic conditions including diabetes and obesity. Public awareness campaigns and community-based interventions are essential for reducing exposure to these modifiable risk factors [7]. Healthcare professionals, particularly nurses, play a key role in educating patients about stroke, its risk factors, prevention methods, and the importance of lifestyle modifications to minimize future cerebrovascular events. Proactive patient education and intervention can significantly mitigate the adverse effects of stroke on health and quality of life [8].

Extensive research has examined the pathophysiology, risk factors, clinical manifestations, and management strategies for strokes, including thrombolysis and rehabilitation. These studies underscore the socioeconomic burden of stroke, highlighting the importance of early detection, timely intervention, and the critical role of healthcare professionals in patient education and prevention. Epidemiological evidence points to a rising global prevalence of stroke, leading to increased mortality and long-term disability, particularly among older populations. Despite this, research gaps remain, especially in region-specific and hospital-based contexts. There is a lack of detailed data on stroke patient profiles in tertiary care settings, including variations in clinical presentation, outcomes, genetic predisposition, dietary patterns, healthcare accessibility, and socio-economic factors. Additionally, longitudinal studies on post-stroke recovery, rehabilitation, and quality of life are limited, and the practical adherence and effectiveness of existing stroke management guidelines in specific healthcare systems require further evaluation [9,10].

Addressing these gaps is vital for designing targeted, evidence-based interventions to enhance patient care and clinical outcomes. Conducting detailed studies on the clinical characteristics of stroke within tertiary care hospitals can generate region-specific data that inform prevention strategies, optimize treatment protocols, and improve rehabilitation services. Understanding the clinical profile, risk factors, and presentations of cerebrovascular accidents enables healthcare professionals to refine treatment plans, enhance early diagnosis, and ultimately improve patient outcomes [11].

The aimed of this study is to examined the clinical profile of cerebrovascular accidents in patients admitted to a tertiary care hospital, with a focus on understanding the presentation, characteristics, and course of the condition. Additionally, the study seeks to evaluate the various risk factors associated with cerebrovascular accidents, including demographic, lifestyle, and comorbid conditions, to gain a comprehensive understanding of factors contributing to their occurrence and to inform better prevention and management strategies.

MATERIAL AND METHODS

This prospective observational study was conducted at the Department of General Medicine, at tertiary care hospital from July 2023 and June 2025. Ethical approval has been obtained from the Ethical Approval Committee of tertiary care hospital.

Study Population

The study population included patients aged over 18 years with a clinically and radiologically confirmed diagnosis of cerebrovascular

accident, who were hemodynamically stable and provided informed consent. Patients under 18 years of age, pregnant individuals, those who were hemodynamically unstable, cases of stroke due to trauma, and patients experiencing transient ischemic attacks were excluded from the study. This selection ensured a focused and safe cohort for assessing the clinical profile and associated risk factors of cerebrovascular accidents.

Data Analysis

The analysis of 180 cerebrovascular accident patients revealed that the majority were males (60%) and predominantly aged 61–75 years (77.78%). Weakness was the most common presenting complaint (31.67%), followed by visual symptoms and seizures. Most cases had gradual onset (65%) and a positive family history (48.33%), while personal risk factors included smoking (30.56%) and alcohol use (26.67%). Elevated blood pressure was present in 67.78%, and obesity-related BMI (25–29.9) accounted for 67.22% of cases.

RESULTS

Table 1: Age-wise Distribution of Patients with Cerebrovascular Accident

Age(years)	Count (%)
≤60	13(7.22%)
61 - 75	140(77.78%)
76 - 90	27(15.00%)
Total	180(100%)

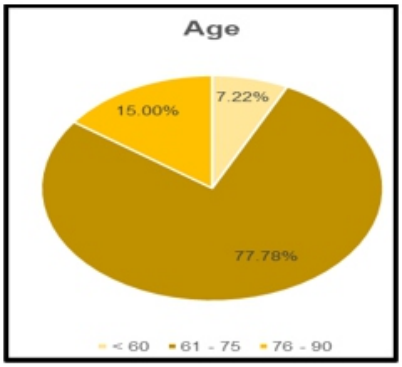


Figure 1: Age-wise Distribution of Patients with Cerebrovascular Accident

Most cerebrovascular accident patients were aged 61–75 years (77.78%), with fewer in the 76–90 years group (15%) and only 7.22% under 60 years.

Table 2: Chief Complaints of Patients with Cerebrovascular Accident

Chief Complaints	Count (%)
Weakness	57 (31.67%)
Visual Symptoms	28 (15.56%)
Seizure	22 (12.22%)
Speech-Related Symptoms	15 (8.33%)
Facial Involvement	13 (7.22%)
Headache	12 (6.67%)
Imbalance	11 (6.11%)
Numbness	11 (6.11%)
Dizziness	11 (6.11%)
Total	180(100%)

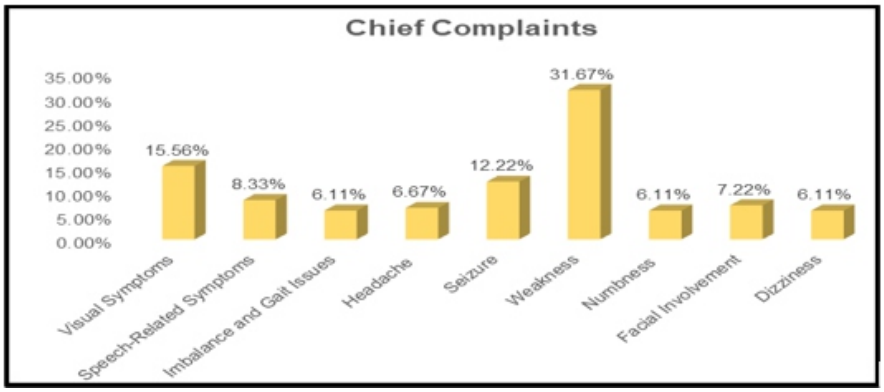


Figure 2: Chief Complaints of Patients with Cerebrovascular Accident

Weakness was the most common complaint in cerebrovascular accident patients (31.67%), followed by visual symptoms (15.56%) and seizures (12.22%), while other symptoms like speech issues, facial involvement, headache, imbalance, numbness, and dizziness occurred less frequently.

Table 3: History of present illness of Patients with Cerebrovascular Accident

History of present illness	Count (%)
Sudden onset	63(35.00%)
Gradual onset	117(65.00%)
Total	180(100%)

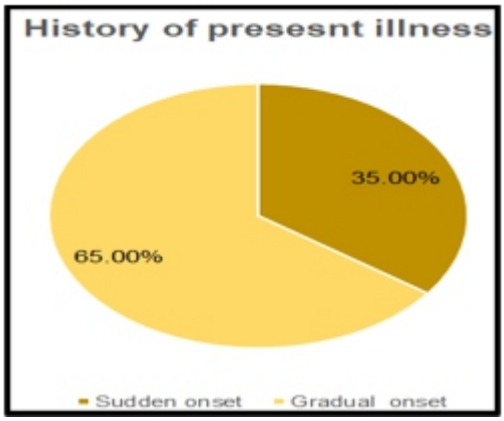
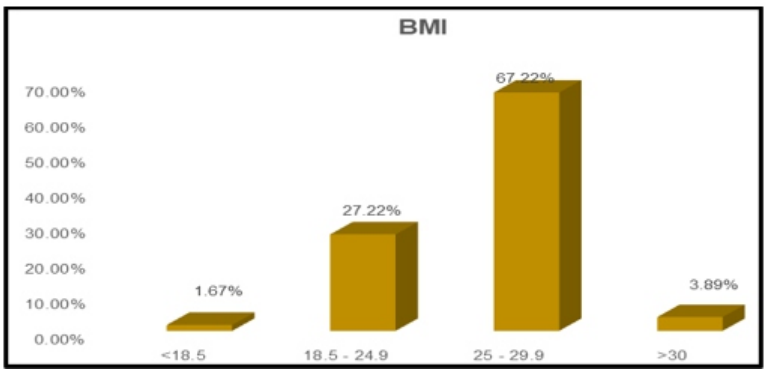


Figure 3: History of Present illness of Patients with Cerebrovascular Accident

In cerebrovascular accident patients, most had a gradual onset of symptoms (65%), while a smaller proportion (35%) experienced a sudden onset

Table 4: BMI of Patients with Cerebrovascular Accident

BMI	Count (%)
<18.5	3(1.67%)
18.5 - 24.9	49(27.22%)
25 - 29.9	121(67.22%)
>30	7(3.89%)
Total	180(100%)



Graph 4: BMI of Patients with Cerebrovascular Accident

Most cerebrovascular accident patients were overweight (67.22%), followed by those with normal BMI (27.22%), while obesity (3.89%) and underweight (1.67%) were much less common.

Table 5: Speech of Patients with Cerebrovascular Accident

Speech (with Handedness)	Count (%)
Normal	96(53.33%)
Nonfluent Aphasia	36(20.00%)
Fluent Aphasia	47(26.11%)
Absent	1(0.56%)
Total	180(100%)

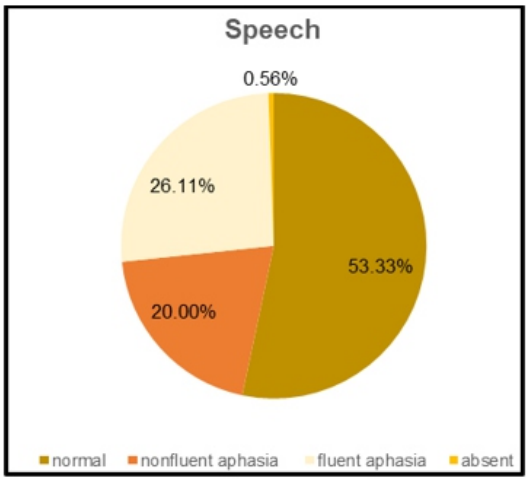


Figure 5: Speech of Patients with Cerebrovascular Accident

Over half of cerebrovascular accident patients had normal speech (53.33%), while 26.11% showed fluent aphasia, 20% nonfluent aphasia, and 0.56% had absent speech.

Table 6: Motor Function of Patients with Cerebrovascular Accident

Motor Function	Absent	Present	Impaired	Exaggerated	Total
Coordination	47 (26.11%)	74 (41.11%)	59 (32.78%)	–	180(100%)
Involuntary Movements	126 (70.00%)	54 (30.00%)	–	–	180(100%)
Gait	–	64 (35.56%)	116 (64.44%)	–	180(100%)
Reflexes	73 (40.56%)	60 (33.33%)	–	47 (26.11%)	180(100%)

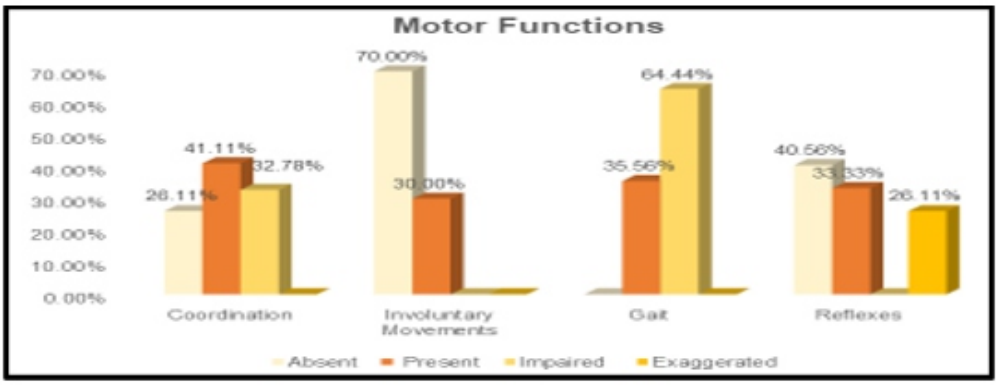


Figure 6: Motor Function of Patients with Cerebrovascular Accident

In cerebrovascular accident patients, coordination was normal in 41.11%, impaired in 32.78%, and absent in 26.11%, while gait was impaired in 64.44% and involuntary movements present in 30%. Reflexes were absent in 40.56%, normal in 33.33%, and exaggerated in 26.11%.

Table 7: Tone of Patients with Cerebrovascular Accident

Motor Functions	Tone
Hypertonia	34(18.89%)
Hypotonia	42 (23.33%)
Normal	104(57.78%)
Total	180 (100%)

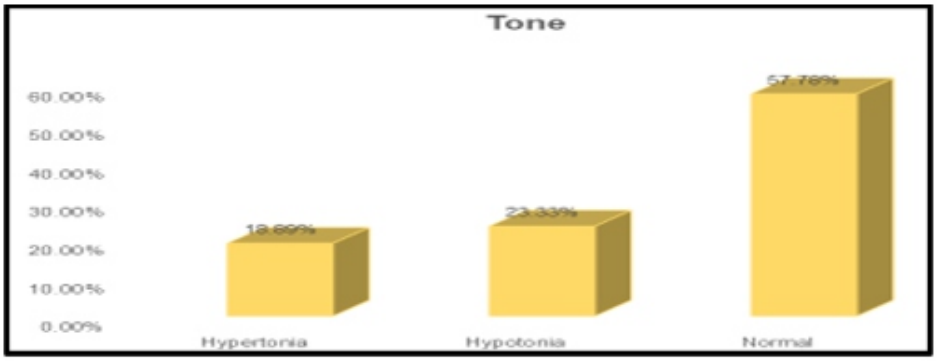


Figure7: Tone of Patients with Cerebrovascular Accident

In cerebrovascular accident patients, 57.78% had normal muscle tone, while 23.33% showed hypotonia and 18.89% hypertonia.

Table 8: Power of Patients with Cerebrovascular Accident

Power	Count (%)
0/5	56 (31.11%)
1/5	54 (30.00%)
2/5	56 (31.11%)
3/5	14 (7.78%)
Total	180 (100%)

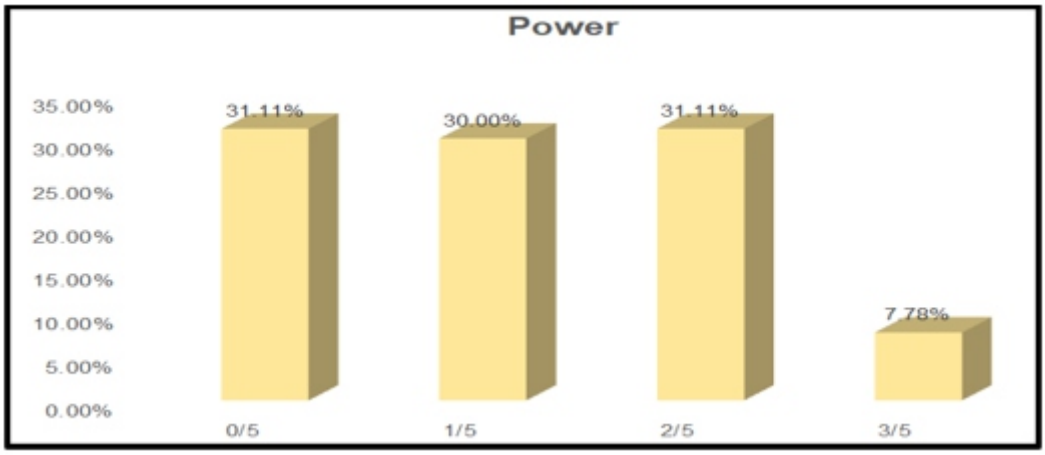


Figure 8: Power of Patients with Cerebrovascular Accident

Among cerebrovascular accident patients, most had severe motor weakness with 0/5 (31.11%), 1/5 (30%), or 2/5 (31.11%) power, while only 7.78% retained 3/5 power.

DISCUSSION

The present study was conducted to evaluate the clinical profile and neurological manifestations of patients with cerebrovascular accidents (CVA) admitted to a tertiary care hospital. The demographic analysis revealed that the majority of patients belonged to the elderly age group, with 77.78% of cases occurring between 61 and 75 years of age [12]. This finding aligns with established evidence that stroke incidence increases with age due to cumulative vascular changes such as atherosclerosis and reduced vessel compliance. Similar observations were reported by **Kumar M. et. al; 2023** and **Mahanta B.N. et. al; 2018,** who documented a higher prevalence of stroke among patients above 60 years, attributing this to both physiological vulnerability and a higher prevalence of comorbidities such as hypertension and diabetes mellitus in older populations [13,14].

In contrast to studies reporting a clear male predominance, this study observed a relatively balanced gender distribution, with males constituting 60% and females 40% of cases. While partially aligning with global trends, this finding deviates from prior research, such as Al- Al-**Nabhi A, et. al; 2024** and **Sayyed B, et. al; 2020,** which identified male preponderance possibly due to higher rates of smoking, alcohol intake, and occupational stress. The near-equal gender distribution may indicate increasing cardiovascular risk factors among women, delayed menopause, or improved healthcare access and reporting among female patients [15,16].

Family history of stroke was present in 48.33% of patients, and nearly a third had a history of smoking (30.56%) or alcohol use (26.67%). These findings are consistent with **Mahanta BN, et. al; 2018,** who reported strong associations between lifestyle factors and stroke risk. Tobacco and alcohol accelerate vascular damage via endothelial dysfunction,

platelet aggregation, and elevated blood pressure, increasing susceptibility to stroke. Anthropometric evaluation revealed 67.22% of patients were overweight (BMI 25–29.9), while 27.22% had normal BMI, emphasizing the role of obesity as a modifiable stroke risk factor linked with metabolic syndrome, diabetes, and dyslipidemia [13].

Vital sign assessment indicated that 67.78% of patients had elevated systolic and diastolic blood pressures, reaffirming hypertension as the leading risk factor for stroke, a finding consistent with previous studies by **Sayyed B, et. al; 2020**. General examination showed that 83.89% of patients were conscious, while 16.11% were disoriented regarding time, place, or person, suggesting widespread cerebral involvement. Cognitive and emotional impairments were also noted, reflecting post-stroke neuropsychological deficits affecting memory, intelligence, and mood. Speech impairment occurred in 53.33% of patients, with 20% having non-fluent aphasia and 26.11% fluent aphasia, indicating left hemisphere involvement and perisylvian language area damage [15].

Cranial nerve examination revealed carotid artery stenosis in 10% of patients, occasional visual field abnormalities, papilledema, taste disturbances, and facial nerve dysfunction in approximately 42%, evidenced by asymmetrical blinking, impaired frowning, and oral movement deficits. Motor assessment demonstrated moderate to severe upper motor neuron involvement, with preserved power in sternomastoid and trapezius muscles in over 95% of patients, though gait impairment affected 64.44% and coordination deficits occurred in 26.11%. Sensory examination indicated largely intact superficial and proprioceptive sensations, but cortical functions such as stereognosis and graphesthesia were impaired in 28.33% and 36.11%, respectively [17-19].

Visceral assessments revealed swallowing difficulties in 63.33% and bladder dysfunction in 50%, reflecting bulbar and autonomic involvement. Primitive reflexes were present in a minority of patients (grasp reflex 6.11%, glabellar tap 1.67%), suggesting frontal lobe release signs. Trophic changes were observed in 11–13% of patients, including bed sores, trophic ulcers, and skin and hair changes, while no Charcot joints were reported. **McGlinchey MP, et. al; 2020,** highlighted the functional impairment and immobility common in stroke survivors, emphasizing the need

for early rehabilitation, pressure sore prevention, and multidisciplinary interventions including physiotherapy, dietary support, and comprehensive post-stroke care to reduce secondary complications and improve recovery outcomes [20,21].

CONCLUSION

This prospective observational study at a tertiary care hospital analyzed the clinical profile, neurological manifestations, and risk factors in patients with cerebrovascular accidents. Stroke was most common in elderly males aged 61–75 years, with hypertension, smoking, alcohol use, and high BMI as prevalent modifiable risks, while family history suggested genetic and environmental influences. Common clinical features included motor weakness, speech disturbances, cranial nerve deficits, carotid artery stenosis, sensory impairments, and cortical dysfunctions, with over 10% showing trophic changes. The study highlights the need for early diagnosis, risk factor management, rehabilitation, and public health interventions.

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