



Original Article

Clinico-Demographic Profile and Risk Factors of Stroke: A Hospital-Based Observational Study

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Received: 25-02-2026

Accepted: 23-03-2026

Available online: 08-04-2026

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Medical and Pharmaceutical Research

ABSTRACT

Background: Stroke is a leading cause of mortality and long-term disability worldwide, with a rising burden in developing countries due to increasing prevalence of vascular risk factors.

Aim: To evaluate the clinicodemographic profile and risk factors of stroke in patients admitted to a tertiary care hospital.

Materials and Methods: This hospital-based observational study was conducted in the Department of Medicine over a period of 6 months. A total of 50 patients diagnosed with stroke were included. Demographic details, clinical presentation, type of stroke, and associated risk factors were recorded and analyzed using descriptive statistics.

Results: Among the 50 patients, males constituted 60% of cases. The majority of patients (48%) were above 60 years of age. Ischemic stroke was more common (68%) than hemorrhagic stroke (32%). Hemiparesis (80%) was the most common clinical presentation, followed by speech disturbances (56%). Hypertension (72%) was the most prevalent risk factor, followed by diabetes mellitus (48%), smoking (40%), dyslipidemia (36%), and alcohol consumption (32%).

Conclusion: Stroke predominantly affects elderly males and is strongly associated with modifiable risk factors, particularly hypertension and diabetes mellitus. Early identification and effective control of these risk factors are essential to reduce stroke burden and improve outcomes.

Keywords: Stroke, risk factors, hypertension, ischemic stroke, epidemiology.

INTRODUCTION

Stroke is a major global health problem and one of the leading causes of mortality and long-term disability worldwide [1]. It is defined as a sudden onset of focal neurological deficit of vascular origin lasting more than 24 hours or resulting in death [2]. Stroke is broadly classified into ischemic and hemorrhagic types, with ischemic stroke accounting for the majority of cases [3].

The burden of stroke is increasing rapidly in developing countries, including India, due to demographic transition, urbanization, and lifestyle changes [4]. Epidemiological studies have shown that low- and middle-income countries contribute to more than 70% of global stroke cases and deaths [1]. The rising incidence is largely attributed to the increasing prevalence of modifiable risk factors such as hypertension, diabetes mellitus, smoking, alcohol consumption, and dyslipidemia [5].

Among these, hypertension is considered the most important and consistent risk factor for both ischemic and hemorrhagic stroke [6]. Other risk factors such as diabetes mellitus and dyslipidemia contribute to atherosclerosis, thereby increasing the risk of ischemic stroke [7]. Lifestyle factors, including smoking and alcohol consumption, further exacerbate vascular damage and increase stroke susceptibility [5].

The clinical presentation of stroke varies depending on the area of the brain affected but commonly includes hemiparesis, speech disturbances, sensory deficits, and altered consciousness [8]. Early identification of these symptoms and prompt management are crucial in reducing morbidity and mortality associated with stroke.

Understanding the clinicodemographic profile and associated risk factors is essential for planning preventive strategies and optimizing patient care. However, regional variations exist in the distribution of risk factors and clinical presentation. Therefore, the present study was undertaken to evaluate the clinicodemographic profile and risk factors of stroke in patients admitted to a tertiary care hospital.

REVIEW OF LITERATURE

Stroke is a major global health concern and a leading cause of mortality and disability worldwide, accounting for a significant proportion of the global disease burden [1,2]. The incidence of stroke is increasing, particularly in low- and middle-income countries, due to demographic transition, urbanization, and changes in lifestyle patterns [3,4].

Epidemiological studies have shown that ischemic stroke accounts for approximately 70–80% of all stroke cases, while hemorrhagic stroke constitutes the remaining proportion [5]. The higher prevalence of ischemic stroke is attributed to atherosclerosis, thromboembolism, and small vessel disease [6].

Age is one of the most important non-modifiable risk factors for stroke, with the incidence increasing significantly after the age of 60 years [7]. Several studies have reported that stroke predominantly affects elderly individuals, although there is a rising trend of stroke among younger populations [8,9]. Gender differences have also been observed, with males having a higher incidence of stroke compared to females, possibly due to increased exposure to lifestyle-related risk factors [10]. Hypertension is widely recognized as the most significant modifiable risk factor for stroke and is associated with both ischemic and hemorrhagic subtypes [11,12]. Chronic elevation of blood pressure leads to vascular endothelial damage, atherosclerosis, and increased risk of intracerebral hemorrhage [13]. The INTERSTROKE study identified hypertension as the strongest contributor to stroke risk globally [14].

Diabetes mellitus is another important risk factor that increases the risk of ischemic stroke through mechanisms such as accelerated atherosclerosis and endothelial dysfunction [15]. Dyslipidemia also plays a crucial role in the development of atherosclerotic plaques, thereby increasing the risk of cerebrovascular events [16].

Lifestyle factors such as smoking and alcohol consumption have been strongly associated with stroke risk. Smoking has been shown to double the risk of stroke by promoting thrombosis, endothelial injury, and atherosclerosis [17,18]. Excessive alcohol intake is also linked to an increased risk of both ischemic and hemorrhagic stroke [19].

The clinical presentation of stroke varies depending on the area of the brain involved but commonly includes hemiparesis, speech disturbances, altered consciousness, and seizures [20]. Early recognition of these symptoms is crucial for timely intervention and improved outcomes.

Despite advances in diagnostic and therapeutic modalities, stroke continues to be associated with high morbidity and mortality [2]. The variability in risk factor distribution and clinical presentation across different regions highlights the need for region-specific studies to better understand the epidemiology of stroke and to guide preventive strategies.

MATERIALS AND METHODS

Study Design

Hospital-based observational study

Study Setting

Department of Medicine

Study Duration

6 months

Sample Size

50 patients

Inclusion Criteria

- Patients diagnosed with stroke (clinical and/or radiological)
- Age \geq 18 years
- Admitted during study period

Exclusion Criteria

- Stroke mimics (tumors, trauma, infections)
- Patients unwilling to participate

Data Collection

Data collected using structured proforma including:

- Demographic details
- Clinical features
- Risk factors
- Type of stroke

Investigations

- CT/MRI brain
- Blood sugar
- Lipid profile
- Blood pressure

Outcome Measures

- Type of stroke
- Risk factor distribution

Statistical Analysis

Data analyzed using descriptive statistics (percentage, proportion)

RESULTS

A total of 50 patients diagnosed with stroke were included in the present study. Among them, 30 (60%) were males and 20 (40%) were females, indicating a male predominance.

Table 1: Demographic Profile of Patients

Variable	Number (n=50)	Percentage (%)
Male	30	60%
Female	20	40%

The majority of patients were in the age group of more than 60 years (48%), followed by 41–60 years (40%), while younger patients (18–40 years) constituted only 12% of the study population.

Table 2: Age Distribution of Patients

Age Group (years)	Number	Percentage (%)
18–40	6	12%
41–60	20	40%
>60	24	48%

Based on radiological classification, ischemic stroke was more common, observed in 34 (68%) patients, whereas hemorrhagic stroke was seen in 16 (32%) patients.

Table 3: Type of Stroke

Type	Number	Percentage (%)
Ischemic	34	68%
Hemorrhagic	16	32%

With regard to clinical presentation, hemiparesis was the most common presenting feature, observed in 40 (80%) patients. This was followed by speech disturbances in 28 (56%) patients and altered consciousness in 20 (40%) cases. Seizures were noted in 10 (20%) patients.

Table 4: Clinical Presentation of Stroke

Feature	Number	Percentage (%)
Hemiparesis	40	80%
Speech disturbance	28	56%
Altered consciousness	20	40%
Seizures	10	20%

Analysis of risk factors revealed that hypertension was the most common risk factor, present in 36 (72%) patients. Diabetes mellitus was observed in 24 (48%) patients, while smoking was reported in 20 (40%) cases. Dyslipidemia and alcohol consumption were noted in 18 (36%) and 16 (32%) patients, respectively.

Table 5: Distribution of Risk Factors

Risk Factor	Number	Percentage (%)
Hypertension	36	72%
Diabetes mellitus	24	48%
Smoking	20	40%
Dyslipidemia	18	36%
Alcohol consumption	16	32%

Overall, the findings indicate that stroke predominantly affected elderly males, with ischemic stroke being more common. Hypertension and diabetes mellitus were the most significant risk factors associated with stroke in the study population.

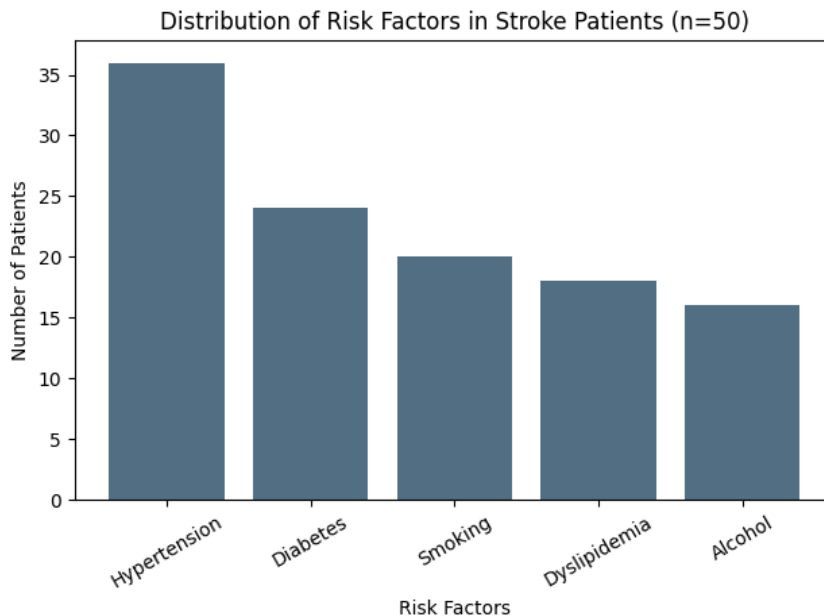


Figure-1: Distribution of risk factors among stroke patients (n=50), demonstrating hypertension as the most prevalent risk factor (72%), followed by diabetes mellitus (48%), smoking (40%), dyslipidemia (36%), and alcohol consumption (32%).

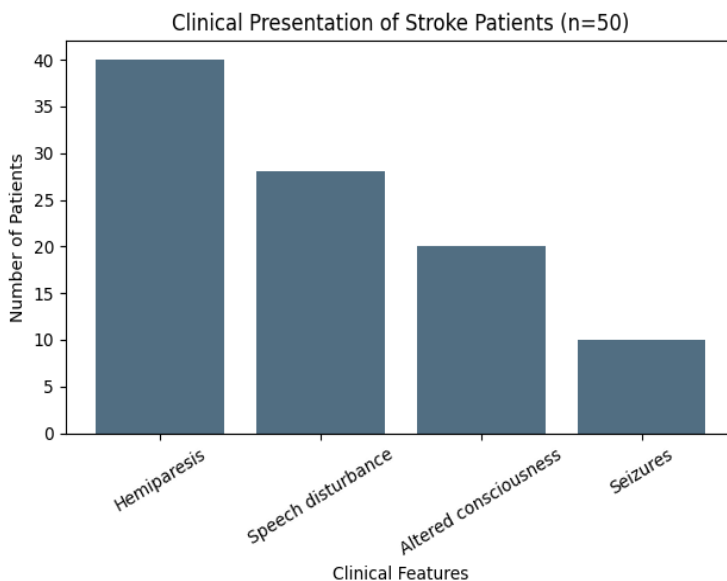


Figure-2: Distribution of clinical features among stroke patients (n=50), showing hemiparesis as the most common presentation (80%), followed by speech disturbance (56%), altered consciousness (40%), and seizures (20%).

DISCUSSION

Stroke remains a major global health challenge and is one of the leading causes of mortality and long-term disability worldwide, particularly in low- and middle-income countries [1,2]. The burden of stroke is increasing in developing nations due to rapid urbanization, aging population, and rising prevalence of vascular risk factors [3,4]. The present study evaluated the clinicodemographic profile and associated risk factors of stroke in a tertiary care hospital setting.

In the present study, a male predominance (60%) was observed among stroke patients. This finding is consistent with previous studies that have reported a higher incidence of stroke among males [5–7]. This gender difference has been attributed to increased exposure to modifiable risk factors such as smoking, alcohol consumption, and occupational stress in males, along with possible hormonal influences that may offer some protection in females [8,9].

The majority of patients in this study were aged above 60 years, highlighting the strong association between advancing age and stroke risk. Age is a well-established non-modifiable risk factor, with increasing incidence observed in older populations due to progressive vascular degeneration, atherosclerosis, and accumulation of comorbid conditions [10–12]. Similar age distribution patterns have been reported in both Indian and international studies [6,13].

Ischemic stroke was found to be more common (68%) than hemorrhagic stroke (32%) in the present study. This observation is in agreement with global epidemiological data indicating that ischemic stroke accounts for approximately 70–80% of all stroke cases [1,14]. The predominance of ischemic stroke can be attributed to atherosclerotic changes, thromboembolism, and small vessel disease associated with chronic vascular risk factors [15].

With respect to clinical presentation, hemiparesis was the most common symptom observed, followed by speech disturbances and altered consciousness. These findings are consistent with earlier studies where motor deficits have been identified as the most frequent presenting feature of stroke [16,17]. The variability in clinical presentation depends on the location and extent of brain involvement, reinforcing the need for prompt recognition and management [18].

Among the risk factors, hypertension emerged as the most significant, present in 72% of patients. Hypertension is widely recognized as the most important modifiable risk factor for stroke and is strongly associated with both ischemic and hemorrhagic subtypes [11,19,20]. Chronic elevation of blood pressure leads to endothelial dysfunction, vascular remodeling, and increased risk of vessel rupture or occlusion [21].

Diabetes mellitus was observed in 48% of patients and is known to significantly increase the risk of ischemic stroke through mechanisms such as accelerated atherosclerosis, endothelial dysfunction, and increased thrombogenicity [22,23]. Similarly, dyslipidemia, present in 36% of cases, contributes to plaque formation and vascular occlusion, thereby increasing stroke risk [24].

Lifestyle factors such as smoking (40%) and alcohol consumption (32%) were also commonly observed. Smoking has been shown to double the risk of stroke by promoting atherosclerosis, increasing blood coagulability, and causing endothelial injury [25,26]. Excessive alcohol intake has also been associated with increased risk of both ischemic and hemorrhagic stroke [27].

The coexistence of multiple risk factors in many patients highlights the multifactorial nature of stroke pathogenesis. Studies have demonstrated that the combined presence of risk factors significantly increases stroke risk compared to individual factors alone [28,29]. Therefore, comprehensive risk factor modification is essential for effective stroke prevention.

The findings of the present study emphasize the critical role of modifiable risk factors in the development of stroke. Early detection and appropriate management of hypertension, diabetes, dyslipidemia, and lifestyle-related factors can substantially reduce the burden of stroke [30].

However, this study has certain limitations. The relatively small sample size and single-center design may limit the generalizability of the findings. Additionally, long-term outcomes and functional recovery were not assessed. Future multicentric studies with larger sample sizes are recommended to validate these findings and provide a more comprehensive understanding of stroke epidemiology.

CONCLUSION

Stroke predominantly affects elderly males and is strongly associated with modifiable risk factors, particularly hypertension, diabetes mellitus, and lifestyle factors such as smoking and alcohol use. Ischemic stroke was the most common subtype, with hemiparesis being the predominant clinical presentation. Early identification and effective control of these risk factors are essential to reduce the burden of stroke and improve patient outcomes.

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