

# Demographic and Risk Factor Profile of Stroke Patients

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## ABSTRACT

**Background:** Stroke is a leading cause of death and disability worldwide, with increasing prevalence in developing countries such as Bangladesh. Identification of demographic characteristics and modifiable risk factors is essential for prevention and management. This study aimed to evaluate the demographic profile and major risk factors among hospitalized stroke patients. **Methods & Materials:** An observational study was conducted among 100 stroke patients admitted to the Medicine and Neurology Departments of Dhaka Medical College Hospital, Dhaka, from July 2008 to December 2008. Patients presenting with acute or recurrent stroke were included, while those already on anti-lipid therapy or who declined participation were excluded. Data on demographics, occupation, medical history, and comorbid conditions were collected using a structured questionnaire. **Results:** The majority of patients (56%) were above 60 years of age, with a male-to-female ratio of 2.55:1, indicating male predominance. Occupationally, 86% were businessmen, teachers, service holders, or housewives. Among lifestyle and comorbid risk factors, 66% were smokers, 68% were hypertensive, and 28% were diabetic. Cardiovascular comorbidities included ischemic heart disease in 30% and valvular heart disease in 8% of patients. **Conclusion:** Stroke predominantly affects elderly males and is strongly associated with hypertension, smoking, and ischemic heart disease, with diabetes and valvular heart disease contributing to a lesser extent. Early identification and control of modifiable risk factors through lifestyle modification, regular screening, and public health interventions are essential to reduce the stroke burden in Bangladesh.

**Keywords:** Stroke, Risk factors, Hypertension, Smoking, Ischemic heart disease

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## INTRODUCTION

Stroke is one of the leading causes of death and disability worldwide, posing a major public health challenge, particularly in developing countries [1]. It is characterized by the sudden onset of focal neurological deficits due to disturbance in cerebral blood flow, resulting either from vascular occlusion (ischemic stroke) or rupture of a cerebral vessel (hemorrhagic stroke) [2]. Globally, stroke accounts for approximately 11% of total deaths and remains a principal contributor to long-term disability among adults [3].

In recent years, the incidence of stroke has been rising in low- and middle-income countries, primarily due to rapid urbanization, lifestyle changes, and the growing burden of non-communicable diseases such as hypertension, diabetes, and

dyslipidemia [4]. Bangladesh, with its large population and limited healthcare resources, is witnessing an increasing number of stroke cases, many of which affect individuals at a relatively younger age compared to those in developed nations [5]. Understanding the demographic profile and identifying the common risk factors among stroke patients are essential for formulating preventive strategies and improving clinical outcomes [6].

Several studies have identified hypertension as the single most important modifiable risk factor for stroke. Other established risk factors include diabetes mellitus, dyslipidemia, smoking, obesity, atrial fibrillation, and sedentary lifestyle [7]. Among these, dyslipidemia—characterized by abnormal levels of serum lipids—plays a key role in the development of

atherosclerosis, which predisposes individuals to ischemic stroke [8]. Elevated total cholesterol, low-density lipoprotein (LDL), and triglycerides, along with reduced high-density lipoprotein (HDL), contribute to endothelial dysfunction and cerebrovascular events [9]. Despite this, the relationship between lipid abnormalities and stroke subtypes remains a matter of ongoing research and debate, especially in the South Asian context.

Given the increasing prevalence of stroke in Bangladesh and the limited local data on its demographic and biochemical correlates, this study was undertaken to explore the demographic characteristics and major risk factors associated with stroke among hospitalized patients. Particular emphasis was placed on assessing the role of dyslipidemia and its association with different types of stroke. By identifying the key demographic patterns and modifiable risk factors, this study aims to provide valuable insights for clinicians and public health policymakers to design targeted interventions, promote early screening, and implement lifestyle modifications that can effectively reduce the burden of stroke in our population.

## METHODS & MATERIALS

This observational study was conducted among hospitalized patients in different wards of the medicine and neurology departments of Dhaka Medical College Hospital, Dhaka, from July 2008 to December 2008. The total sample size of the study was 100 stroke patients. The study population consisted of one hundred stroke patients admitted to the department of neurology and department of medicine during the study period. Inclusion criteria were patients presenting with acute or recurrent stroke, with blood samples collected before

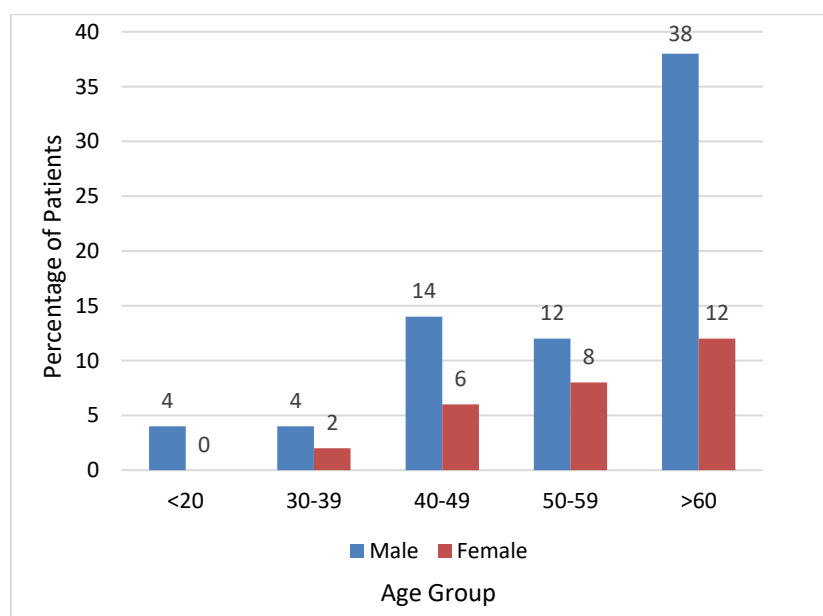
starting any anti-lipid drug. Exclusion criteria included patients dying before recording the information, patients and or party refusing to give consent to take part under the study, and patients who were already on anti-lipid drugs. Case sampling was done consecutively, and informed written consent was obtained from all participants. Medical history was taken from each patient with emphasis on finding out the relations of stroke with dyslipidaemia. Thorough physical examination, especially neurological examination and examination of the cardiovascular system, was carried out. All relevant information from history, clinical findings, and investigation results were recorded in a pre-designed questionnaire and data collection sheet. The main tool of the study was serum lipid profile, which was done in the laboratory by spectrophotometric principle using the "RA-50 Chemistry Analyzer.

## RESULTS

**Table – I: Age Distribution of Patients (n=100)**

| Age range (years) | No. of Patient | Percentage |
|-------------------|----------------|------------|
| <20               | 4              | 4%         |
| 20-29             | 0              | 0%         |
| 30-39             | 8              | 8%         |
| 40-49             | 18             | 18%        |
| 50-59             | 14             | 14%        |
| >60               | 56             | 56%        |

Table I shows maximum number of stroke patient (56%) was above 60 years of age.



**Figure – 1: Distribution of age of the stroke patients according to sex**

Figure 1 shows male predominance. Male Female Ratio is 2.55:1. Majority of the patients are above 60 years of age.

**Table – II: Occupational categories of Patient (n=100)**

| Occupation     | No. of Patient | Percentage |
|----------------|----------------|------------|
| Executive      | 0              | 0%         |
| Professional   | 2              | 2%         |
| Businessman    | 32             | 32%        |
| Teachers       | 16             | 16%        |
| Service Holder | 14             | 14%        |
| Farmer         | 04             | 04%        |
| Housewife      | 24             | 24%        |
| Others         | 8              | 8%         |

Table II shows that businessman, teachers, service holders and house wives were the majority (86%) of stroke patients.

**Table – III: Smoking as a risk factor for stroke (n=100)**

| Smoker/Non smoker | No. of Patient | Percentage |
|-------------------|----------------|------------|
| Smoker            | 66             | 66%        |
| Non-smoker        | 34             | 34%        |

Table III shows that majority of the patients (66%) were smoker.

**Table – IV: Diabetes mellitus as a risk factor for stroke (n=100)**

| Diabetes mellitus | No. of Patient | Percentage |
|-------------------|----------------|------------|
| Present           | 28             | 28%        |
| Absent            | 72             | 72%        |

Table IV shows that 28% of the stroke patients were diabetic.

**Table – V: Hypertension as a risk factor for stroke (n=100)**

| Blood pressure | No. of Patient | Percentage |
|----------------|----------------|------------|
| Normotensive   | 32             | 32%        |
| Hypertensive   | 68             | 68%        |

Table V shows that 68% stroke patients were hypertensive.

**Table – VI: Ischemic heart disease (IHD) as a risk factor for stroke (n=100)**

| IHD     | No. of Patient | Percentage |
|---------|----------------|------------|
| Present | 30             | 30%        |
| Absent  | 70             | 70%        |

Table VI shows that 30% stroke patients were suffering from IHD (Angina and Infarction).

**Table – VII: Valvular Heart disease as a risk factor for stroke (n=100)**

| Valvular Heart Disease | No. of Patient | Percentage |
|------------------------|----------------|------------|
| Present                | 08             | 08%        |
| Absent                 | 92             | 92%        |

Table VII shows that 8% patients had Valvular heart disease.

## DISCUSSION

This study evaluated the demographic profile and risk factors among 100 hospitalized stroke patients. Our findings demonstrate that stroke predominantly affects elderly males, with 56% of patients above 60 years of age and a male-to-female ratio of 2.55:1. This is consistent with observations by Li et al., who reported a higher incidence of stroke in older males in population-based studies [10]. Mohammad et al., also highlighted male predominance among stroke patients in Bangladesh, aligning with our results [11].

Occupational distribution showed that businessmen, teachers, service holders, and housewives comprised 86% of the study population, reflecting the socio-demographic profile of urban patients presenting to tertiary care hospitals. Similar trends were reported by Muhit et al., indicating that middle-aged and elderly adults in professional and semi-professional occupations are at higher risk of stroke due to lifestyle-related factors [12].

Hypertension was the most prevalent risk factor, observed in 68% of patients, underscoring its central role in stroke pathogenesis. This finding aligns with previous Bangladeshi studies, where hypertension prevalence among stroke patients ranged between 60–70% [13, 14]. Hypertension accelerates atherosclerosis and promotes both ischemic and hemorrhagic strokes [15].

Smoking, observed in 66% of patients, was another major modifiable risk factor, consistent with the findings of Gezmu et al., who reported high smoking rates among South Asian stroke patients [16]. Smoking contributes to endothelial dysfunction and thrombotic risk, particularly in combination with hypertension and dyslipidemia.

Diabetes mellitus was present in 28% of patients, supporting its established role as a cerebrovascular risk factor. Wasay and Khatri reported similar prevalence in South Asian populations, emphasizing the need for optimal glycemic control to reduce stroke risk [17].

Ischemic heart disease (IHD) was noted in 30% of patients, while valvular heart disease affected 8%. Muhit et al., and Kakkar et al., similarly reported high prevalence of IHD and other cardiac comorbidities among stroke patients, highlighting the importance of cardiovascular evaluation in stroke management [12,18]. Cardiovascular comorbidities not only increase the risk of initial stroke but also worsen prognosis and recurrence rates.

Our findings highlight the interplay of multiple modifiable risk factors, particularly hypertension, smoking, and IHD, in stroke occurrence. These results are in line with Sridharan et al., who emphasized that a majority of stroke cases in developing countries occur in patients with clustered cardiovascular risk factors [19]. Dyslipidemia, although not quantified in our results, remains an important contributing factor, as shown by Choudhury et al., in Bangladeshi cohorts [14].

# LIMITATIONS OF THE STUDY

Limitations of this study include its single-center design and relatively small sample size, which may limit generalizability. Despite these limitations, the study provides valuable insights into stroke demographics and risk factors in an urban Bangladeshi population, forming a basis for larger prospective studies.

# CONCLUSION

Stroke in this study predominantly affected elderly males, with the majority of patients above 60 years of age. Hypertension, smoking, and ischemic heart disease were the most common risk factors, while diabetes and valvular heart disease contributed to a lesser extent. These findings highlight the importance of early identification and control of modifiable risk factors through lifestyle modification, regular screening, and public health interventions to reduce the burden of stroke in Bangladesh.

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# CONFLICTS OF INTEREST

There are no conflicts of interest.

# REFERENCES

1. Siddiqui MR, Islam QT, Iqbal MJ, Binte-Mosharraf SS. Socio-demographic status & associated risk factors of the stroke patient's in a tertiary care hospital of Bangladesh. *Anwer Khan Modern Medical College Journal*. 2013 Nov 9;4(2):18-22.
2. Islam MN, Moniruzzaman M, Khalil MI, Basri R, Alam MK, Loo KW, Gan SH. Burden of stroke in Bangladesh. *International journal of stroke*. 2013 Apr;8(3):211-3.
3. Abboud H, Labreuche J, Arauz A, Bryer A, Lavados PG, Massaro A, Collazos MM, Steg PG, Yamout BI, Vicaute E, Amarenco P. Demographics, socio-economic characteristics, and risk factor prevalence in patients with non-cardioembolic ischaemic stroke in low-and middle-income countries: the OPTIC registry. *International Journal of Stroke*. 2013 Oct;8(SA100):4-13.
4. Cavalcante TF, Moreira RP, Araujo TL, Lopes MV. Demographic factors and risk indicators of stroke: comparison between inhabitants of Fortaleza municipal district and the national profile. *Revista latino-americana de enfermagem*. 2010;18:703-8.
5. Choudhury MJ, Chowdhury MT, Nayeem A, Jahan WA. Modifiable and non-modifiable risk factors of stroke: A review update. *Journal of National Institute of Neurosciences Bangladesh*. 2015 Apr 28;1(1):22-6.
6. Arboix A. Cardiovascular risk factors for acute stroke: Risk profiles in the different subtypes of ischemic stroke. *World Journal of Clinical Cases: WJCC*. 2015 May 16;3(5):418.
7. Sallam AR, Al-Aghbari K, Awn H. The clinical profile of stroke: a Yemeni experience. *Jordan Medical Journal*. 2009;43(2).
8. Khan U, Porteous L, Hassan A, Markus HS. Risk factor profile of cerebral small vessel disease and its subtypes. *Journal of Neurology, Neurosurgery & Psychiatry*. 2007 Jul 1;78(7):702-6.
9. Palm F, Urbanek C, Wolf J, Buggle F, Kleemann T, Hennerici MG, Inselmann G, Hagar M, Safer A, Becher H, Grau AJ. Etiology, risk factors and sex differences in ischemic stroke in the Ludwigshafen Stroke Study, a population-based stroke registry. *Cerebrovascular Diseases*. 2012 Dec 1;33(1):69-75.
10. Li L, Yiin GS, Geraghty OC, Schulz UG, Kuker W, Mehta Z, Rothwell PM. Incidence, outcome, risk factors, and long-term prognosis of cryptogenic transient ischaemic attack and ischaemic stroke: a population-based study. *The Lancet Neurology*. 2015 Sep 1;14(9):903-13.
11. Mohammad QD. Management of stroke-Bangladesh perspective. *Bangladesh medical journal*. 2013;42(1):34-7.
12. Muhit MA, Rahman MO, Raihan SZ, Asaduzzaman M, Akbar MA, Sharmin N, Faroque AB. Cardiovascular disease prevalence and prescription patterns at a tertiary level hospital in Bangladesh. *Journal of Applied Pharmaceutical Science*. 2012 Mar 30(Issue):80-4.
13. Islam SM, Mainuddin AK, Islam MS, Karim MA, Mou SZ, Arefin S, Chowdhury KN. Prevalence of risk factors for hypertension: A cross-sectional study in an urban area of Bangladesh. *Global cardiology science and practice*. 2015 Nov 20;2015(4):43.
14. Choudhury KN, Mainuddin AK, Wahiduzzaman M, Islam SM. Serum lipid profile and its association with hypertension in Bangladesh. *Vascular health and risk management*. 2014 Jun 30:327-32.
15. Allen CL, Bayraktutan U. Risk factors for ischaemic stroke. *International journal of Stroke*. 2008 May;3(2):105-16.
16. Gezmu T, Schneider D, Demissie K, Lin Y, Gizzi MS. Risk factors for acute stroke among South Asians compared to other racial/ethnic groups. *PLoS One*. 2014 Sep 30;9(9):e108901.
17. Wasay M, Khatri IA, Kaul S. Stroke in south Asian countries. *Nature reviews neurology*. 2014 Mar;10(3):135-43.
18. Kakkar AK, Mueller I, Bassand JP, Fitzmaurice DA, Goldhaber SZ, Goto S, Haas S, Hacke W, Lip GY, Mantovani LG, Turpie AG. Risk profiles and antithrombotic treatment of patients newly diagnosed with atrial fibrillation at risk of stroke: perspectives from the international, observational, prospective GARFIELD registry. *PloS one*. 2013 May 21;8(5):e63479.
19. Sridharan SE, Unnikrishnan JP, Sukumaran S, Sylaja PN, Nayak SD, Sarma PS, Radhakrishnan K. Incidence, types, risk factors, and outcome of stroke in a developing country: the Trivandrum Stroke Registry. *Stroke*. 2009 Apr 1;40(4):1212-8.