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Original Article

Risk Factors, Symptoms and Prevalence of Ischaemic Stroke in the Adults — A Single Centre Study

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ABSTRACT

Introduction*: A stroke, classified as a serious cerebrovascular event, has the potential to impair an individual's motor capabilities and result in long-term disability. A stroke can manifest as either an ischemic or hemorrhagic event. Both forms of stroke exhibit a considerable overlap in terms of etiological variables.* ***Objective:*** *The objective of this study was to determine the primary etiological factors contributing to ischemic stroke, as well as their connection and prevalence.* ***Methods and Materials****: This cross-sectional observational study was conducted at the Department of Neurology in Cox's Bazar Medical College and Hospital, Cox's Bazar, Bangladesh, from January 2021 to January 2022. A total of 100 diagnosed Ischaemic stroke patients were enrolled in this study.. Clinical examination and CT scan were conducted to diagnosis Ischaemic stroke. Collected data were analyzed using Statistical Package for Social Sciences (SPSS) software, version, 23.0. The ethical clearance of this study was obtained from the Institutional Review Board of Cox's Bazar Medical College, Cox's Baxar, Chattogram, Bangladesh.* ***Results****: Among the 100 patients, most of the patients (49%) were 60–69 years old, whereas the lowest proportion was (1%) 40–49. The sample had (91%) male and (9%) female. The study also observed that (61%) patients were businessmen, (25%) service workers, (8%) homemakers, and (11%) professionals. Initial ischemic stroke symptoms were hemiplegia (91%), speech slurring (94%), and vision blurring (85%), which may involve amaurosis fugax, few people vomited (6%).The study observed that*

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the pulse rate Mean and SD was 85.75 ± 9.61 and systolic blood pressure was 143.25 ± 11.89 during the general system test. Additionally, the average diastolic blood pressure was 93.9 ± 7.12. Our investigation observed 98% extensor plantar reaction and 96% brisk or excessive jerk. The history of the patients indicated that 77% of patients smoked, (92%) had hypertension, (89%) had diabetes, 80% had a positive family history of atherosclerotic events, (85%) has sedentary lifestyle, and (95%) had uncontrolled dyslipidemia. Finally, the study investigated brain CT scan data, showing that (78%) of participants had hypodense cerebral cortical areas and (22%) did not change. ***Conclusion****: This study investigated, smoking, hypertension, diabetes, positive family history, atherosclerotic events, sedentary lifestyle uncontrolled dyslipidemia are the common risk factors of Ischaemic Stroke. This study also investigated hemiplegia, speech slurring, vision blurring and vomiting were the common symptoms of Ischaemic Stroke and (78%) of the study patients had hypodense cerebral cortical areas.*

Keywords: *Ischemic stroke, plantar extensor, brisk or exaggerated jerk, hypo-density, dyslipidemia, cardio-embolic stroke.*

INTRODUCTION

Stroke causes the most permanent damage in developed countries and one of the most deaths worldwide. Diagnostic and therapeutic options for acute ischemic stroke have improved during the past decade. Prompt identification and transport of stroke victims to medical facilities is the first stage in stroke care[1]. Stroke can be defined as focal cerebral dysfunction that persists for more than 24 hours. Transient ischemic attack (TIA) symptoms usually resolve within 24 hours. Ischemic and hemorrhagic strokes comprise "stroke." Anterior (carotid) circulation limitation causes most brain infarctions, although posterior circulation obstruction causes others. A small fraction of ischemic strokes are lacunar strokes. A stroke's principal lesion is cerebral infarction. Lack of blood supply impairs cerebral tissue function reversibly. Chronic conditions can produce infarction, which destroys neurons and supporting structures[2]. Ischemic stroke is caused by impaired cerebral blood flow for a variety of reasons. These characteristics vary with population, time, and place. Older patients have higher rates of ischemic stroke. Ischemic stroke can be made worse by uncontrolled hypertension and poor patient compliance with treatment plans. Stroke risk is increased by diabetes mellitus, both controlled and uncontrolled. Alcoholism and smoking elevate blood pressure passively, increasing the risk of stroke and increasing the likelihood of atherosclerosis. Stroke risk is further increased by obesity, congenital heart disease, cardiac arrhythmias such as atrial fibrillation, and physical inactivity. Stroke risk is increased by salt, saturated fat, and low fruit and vegetable intake. Early risk factor prevention and treatment may help reduce strokes; factors that may contribute include genetics, family history, race and ethnicity, lifestyle, and socioeconomic status. By increasing knowledge of risk factors, symptoms, and prevention, early detection and risk reduction can lower the prevalence of stroke. Reducing the incidence of ischemic stroke requires addressing modifiable risk factors, improving access to healthcare and education, and offering assistance with

smoking cessation, blood pressure management, and diabetes control. The management and prevention of stroke are influenced by demographic risk factors. By cause, ischemic stroke subtypes are classified using TOAST. The five ischemic stroke subtypes identified by TOAST are atherosclerosis of the major arteries, cardio embolism, blockage of small vessels, other varieties of stroke, and unidentified stroke. There are five million enduring disabilities and five million fatalities attributed to this epidemic[3-4]. The incidence of stroke is 62.8 per 100,000 for men and 59 per 100,000 for women. These findings indicate that the incidence of stroke is greater in males. This identity is utilized exclusively during the early stages of development. Recent guidelines from the American Heart Association indicate that women aged 75 and above have an increased susceptibility to cardiovascular health issues compared to men[5-6]. In affluent nations, the incidence of cardio embolic strokes, the most severe form of stroke, is increasing despite developments in the management of arterial hypertension and dyslipidemia[7-8]. A multitude of investigations have been undertaken to examine the cellular and molecular damage inflicted by ischemic stroke on the brain. Cerebral ischemia cannot be diagnosed on the basis of clinical presentation alone[6,9]. With the exception of radiographic patterns of cerebral ischemia in patients with cardiac complications that lead to embolism, no additional causes of stroke were examined. Neuroimaging of a cardio embolic stroke was illustrated. This category of strokes predominantly impacts the cortex[10]. Brain auto regulation supplies specialized brain cells that are energy-hungry with blood. The maintenance of cerebral blood flow remains constant within a specified range of mean arterial blood pressure due to autoregulation[11]. Chronic hypertension physically and functionally changes the neurovascular unit due to endothelial shear stress, oxidative stress, and neuro inflammation[12-14]. Three types of stress can damage the neurovascular system by numerous ways[15].

OBJECTIVE

General Objective:

- To determine the risk factors, symptoms and prevalence of ischaemic stroke in the adults.

Specific Objectives:

- To determine the demographic characteristics of the study patients
- To identify the clinical characteristics of ischaemic stroke
- To observe the risk factors of ischaemic stroke.
- To determine the prevalence of ischaemic stroke by CT scan reports.

METHODS AND MATERIALS

This cross-sectional observational study was conducted at the Department of Neurology in Cox's Bazar Medical College and Hospital, Cox's Bazar, Bangladesh from January 2021 to January 2022. Purposive sampling technique was used and a total of 100 diagnosed Ischaemic stroke patients aged years were enrolled in this study and patients without stroke and other types of stroke were excluded from this study. Clinical examination and CT scan were conducted to diagnosis Ischaemic stroke. The data were collected using a pre structured questionnaire and a case record form. Collected data cleaned, edited, coded and analyzed using Statistical Package for Social Sciences (SPSS)

software, version, 23.0. Descriptive statistical analysis were performed and the results were presented in tables and charts as percentage and frequency. The ethical clearance of this study was obtained from the Institutional Review Board of Cox's Bazar Medical College, Cox;s Baxar, Chattogram, Bangladesh.

RESULTS

Table 1: Distribution of patients according to age (n=100)

Age (years)	Frequency	Percentage (%)
40-49	1	1
50-59	31	31
60-69	49	49
70-79	15	15
80-89	4	4

Table 1 shows the distribution of patients according to age**.** The majority of the patients (49%) belonged to the age range of 60-69 years. (31%) patients between the ages of 50 and 59 years (15%) cases were between the ages of 70-79 years, and only (4%) cases were of 80-89 years. The age group of 40-49 years had the smallest (1%) proportion of patients.

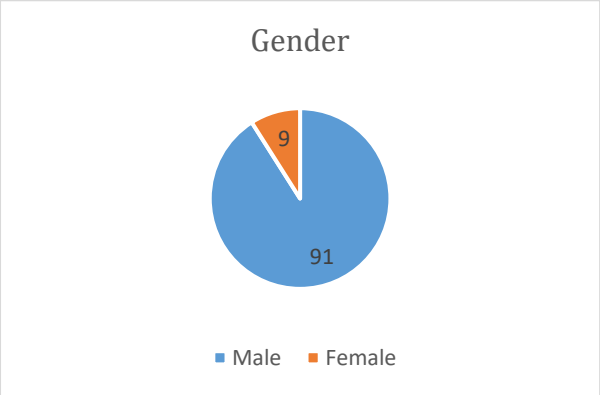

Figure 1: Gender distribution in ischemic stroke (n=100).

Figure 1 illustrates the distribution of patients with ischemic stroke according to gender. Out of the 100 patients, the majority (91%) patients were male, while the remaining (9%) patients were female.

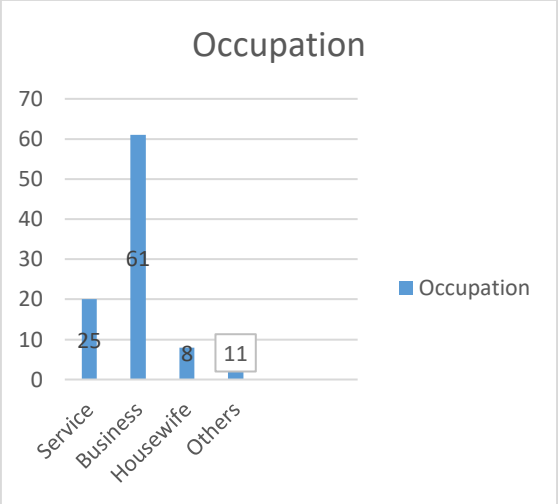

Figure 2: Occupation among patients with ischemic stroke (n=100).

Figure 2 shows the distribution of occupation of the patients diagnosed with ischemic stroke. Out of the 100 patients, (61%) patients were businessmen, (25%) patients were employed in the service sector, (8%) patients were housewives, and the remaining (11%) patients were involved in various other professions.

Table 2: Major symptoms of ischemic stroke (n=100).

Symptoms	Frequency	Percentage
Hemiplegia	91	91
Slurring of speech	94	94
Blurring of vision	85	85
Vomiting	6	6

Table 2 presents the primary manifestations associated with ischemic stroke. At the time of initial presentation, 91% of patients exhibited hemiplegia, 94% experienced slurring of speech, and 85% of patients reported blurring of vision, which included amaurosis fugax. Only 6% of the patients exhibited symptoms of vomiting.

Table 3: Major General Examination in a patient with ischemic stroke (n=100).

Examination	Mean ±SD
Pulse	85.75 ± 9.61
Systolic BP	143.25 ± 11.89
Diastolic BP	93.9 ± 7.12

Table 3 presents the data about the findings of the major clinical examination. Among the patients mean pulse rate was 85.75 ± 9.61, while the mean systolic blood pressure was measured at 143.25 ± 11.89. Additionally, the mean diastolic blood pressure was recorded 93.9 ± 7.12.

Table 4: **Major systemic examination in a patient with ischemic stroke (n=100).**

Examination	Frequency	Percentage (%)
Plantar extensor	98	98
Brisk/Exaggerated jerk	96	96

**Multiple responses observed*

Table 4 displays the data on significant neurological abnormalities. Extensor plantar response was observed in the highest 98% of patients and brisk or excessive jerking was presented in 96% of patients.

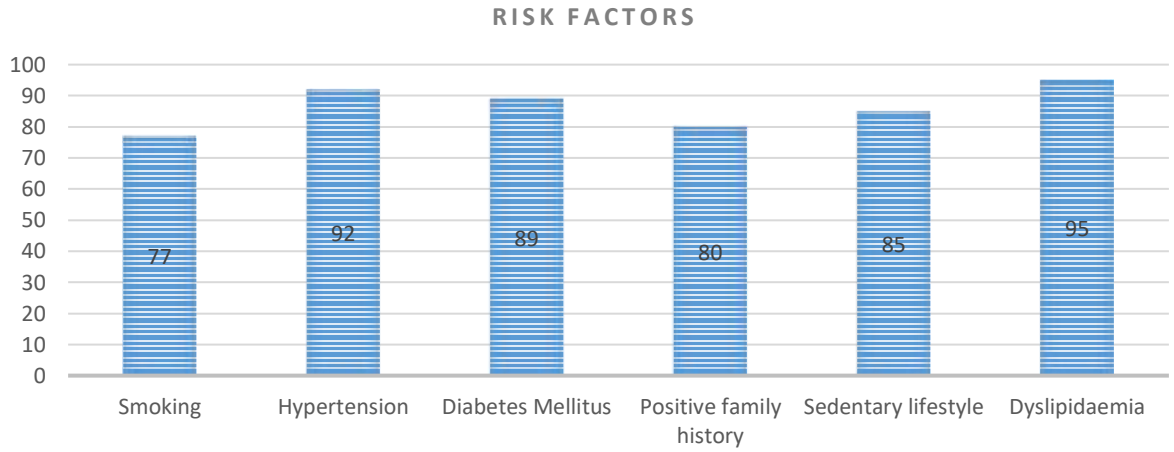

Figure 3: Major risk factors of ischemic stroke

Figure 3 illustrates the prevalence of several risk factors among the patient population. It reveals that (77%) of the patients had a smoking habit, followed by hypertension (92%), diabetes mellitus 89%, positive family history of atherosclerotic events 80%, lead sedentary lifestyle 85%, and 95% of the patients had uncontrolled dyslipidemia.

Table 5: CT scan of brain results in patients with ischemic stroke (n=100).

CT scan of brain	Frequency	Percentage
Hypodense area	78	78
No change	22	22

Table 5 presents the data pertaining to the findings of Brain CT scans. Among the 100 patients (78%) had hypodense areas in the brain, while the remaining (22%) displayed no significant alterations in their initial CT scan results.

DISCUSSION

In our study the age distribution of persons diagnosed with ischemic stroke is presented in Table 1. The data reveals that a significant proportion of patients are situated within the age bracket of 60-69 years, whilst the age group of 40-49 years exhibits the lowest proportion of patients. A group of (31%) of patients, aged between 50 and 59 years. In a different study, the percentage of ischemic strokes went up with age (18–24 years (38.3%); 44–49 years (56.5%), but the percentage of intracerebral hemorrhages went down (18–24 years (34.0%); 44–49 years (18.3%)[16]. Among the entire sample population, (91%) of patients were classified as male, with the remaining (9%) patients were female. According to certain studies, women have a greater prevalence rate (58.3%)[17]. In a similar study conducted in Malaysia, a series of national health and morbidity surveys conducted from 2006 revealed a persistent increase in the incidence of risk factors, including diabetes, hyperlipidemia, and obesity. The aforementioned risk factors have been associated with a rise in the occurrence of stroke among those below the age of 65. Notably, men and women have the most significant increases, with rates of (53.3%) and (50.4%) respectively, within the age range of 35 to 39 years[18]. Compared to men, women who suffer from stroke have a greater mortality rate and a lower functional prognosis[19]. A total of (61%) of patients were businessmen, (25%) patients were service holders, (8%) patients were housewives, and the remaining 11% patients were in other professions. According to one study, men with high-strain employment (high job demand and poor job control) were roughly three times as likely to have a stroke than men with low strain jobs (low job demand and high job control). Job strain was associated with a greater risk of stroke among male workers in low occupational classes (blue-collar and non-managerial occupations)[20]. In our study 91% of individuals had hemiplegia, 94% experienced slurring of speech, and (85%) reported blurring of vision, which may encompass amaurosis fugax. A mere (6%) of the participants displayed signs of vomiting. The average pulse rate was determined to be 85.75 ± 9.61, and the average systolic blood pressure was recorded as 143.25 ± 11.89. Furthermore, the average diastolic blood pressure was measured to be 93.9 ± 7.12. The extensor plantar response is detected in 98% of cases, while brisk or severe jerking is present in 96% of individuals. A total (77%) of the individuals included in the study are smokers, (92%) have been diagnosed with hypertension, (89%) have been diagnosed with diabetes mellitus, (80%) have a positive family history of atherosclerotic events, (85%) lead sedentary lives, and (95%) of the participants have uncontrolled dyslipidemia. Around (78%) of the studied

cases exhibited hypodense regions in the cerebral cortex, whilst the remaining (22%) did not manifest any noteworthy modifications in their initial computed tomography (CT) scan findings. Another study showed that high and moderate levels of intake were linked to a higher likelihood of stroke, however low levels of intake did not reveal any association with stroke. Nonetheless, significant geographical disparities existed, potentially attributable to variances in the demographic attributes of alcohol consumers, as well as the specific types or patterns of alcohol intake[21]. A different study has shown a correlation between aberrant lipid levels and the prognosis of ischemic stroke. The odds ratios (OR) for total cholesterol (TC) exceeding 6.22mmol/L (3.013), triglycerides (TG) surpassing 2.26mmol/L (0.883), low-density lipoprotein cholesterol (LDL-C) beyond 4.14mmol/L (3.157), and high-density lipoprotein cholesterol (HDL-C) falling below 1.04mmol/L (0.482) were reported. In addition, the model was calibrated using the Hosmer Lemeshow goodness of fit test, which indicated that there was no statistically significant difference between the observed results and the projected outcomes[22].

CONCLUSION

This study investigated, smoking, hypertension, diabetes, positive family history, atherosclerotic events, sedentary lifestyle uncontrolled dyslipidemia are the common risk factors of Ischaemic Stroke. This study also investigated hemiplegia, speech slurring, vision blurring and vomiting were the common symptoms of Ischaemic Stroke and (78%) of the study patients had hypodense cerebral cortical areas.

LIMITATIONS OF THE STUDY

This was a single center study with a limited sample size over a short period of time. Therefore, the findings of this study may not represent the whole country.

RECOMMENDATION

To justify the results of this study, a multicenter study may be conducted across the country with a large sample size over a period a long duration

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CONFLICT OF INTEREST

None declared

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