

ORIGINAL ARTICLE

COMMON COMORBIDITIES AMONG STROKE PATIENT AND THEIR OUTCOME IN A TERTIARY CARE HOSPITAL, BANGLADESH

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Abstract:

Background: Stroke is worldwide second leading cause of death and the most common cause of disability. The aim of the study is to evaluate the common comorbidities and their impact on hospital outcome in patients after stroke **Methods:** This observational study was carried out amongst 228 of acute stroke patients after fulfills the inclusion and exclusion criteria and were admitted indifferent medicine unit of Bangabandhu Sheikh Mujib Medical College Hospital, Faridpur, Bangladesh from May 2020 to April 2021. All cases were confirmed by CT scan or MRI of brain. Stroke were categorizes as Ischemic stroke, Intra-cerebral hemorrhage (ICH) and Subarachnoid hemorrhage (SAH). HTN, DM, IHD were considered as common comorbidities. Prognostic factors were included stage II or III hypertension, altered level of consciousness, previous stroke and large size of stroke. **Results:** In this study, male affected more than female (68.42% vs 31.58% and ratio 2.1:1). Age >60 years were more affected (68.86%). Most affected patients were Ischemic stroke (61.40%), then ICH (34.21%) and then SAH (3.07%). Common comorbidities were HTN and DM (48.68% and 34.64% respectively). Most of expired patients had comorbidities (80.64%). Worst prognostic factors were altered level of consciousness, stage II or III hypertension and large size of stroke (27.19%, 25.0% and 19.29% respectively). Among hospital outcome most of patients improved and discharged eventfully (41.22%), Deteriorate (17.98%), remain static and discharged (14.03%) and death 13.59%. **Conclusion:** The most of patients had been suffered from ischemic stroke which were more common in male. The commonest risk factor of stroke was hypertension followed by diabetes mellitus and ischemic heart disease. Our pooled result showed that majority of the patients were improved and discharged and around one sixth of stroke patients have died during hospitalization. The control of comorbid conditions will be much help for prevention of occurrence of stroke and will reduces the disability from stroke events.

Key words: Comorbidities, stroke, hospital outcome.

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Introduction:

Stroke is a clinical syndrome characterized by rapidly developing focal rather than global neurological symptoms and or signs of cerebrovascular origin that persist for 24 hours or more. Now, stroke is the second leading cause of death and the third leading cause of disability worldwide. The pathogenesis of stroke

events is the sudden death of brain cells due to a lack of oxygen supply when blood flow to the brain is blocked or ruptures of corresponding arteries.¹ Throughout the world, low and middle-income countries account for 70% of strokes and 87% of stroke-related deaths and disability.²⁻⁴ According to WHO, the incidence of strokes will be at its highest

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by 2050 in China and India.⁵ The financial burden of stroke in society is high, including immediate management and care of post stroke disability.⁶ The complex anatomy of the brain and its vascularity contribute to the high variability of stroke presentation.⁷ Unfortunately, the neurological symptoms and signs don't accurately indicate either an ischemic or hemorrhagic stroke.⁸ Hypertension, diabetes, ischemic heart disease, advanced age, and smoking are all well-known risk factors for both types of stroke.⁹ The duration of management of acute stroke is variable and depends on multiple factors, like type of stroke, severity, and associated other comorbidities. Stroke survivors require daily living assistance 30% of the time, ambulation assistance 20% of the time, and institutional care 16% of the time, resulting in long-term physical and mental disabilities.¹⁰

Methods:

This observational study was carried out amongst 228 acute stroke patients who were admitted to different medicine units of Bangabandhu Sheikh Mujib Medical College Hospital (BSMMCH), Faridpur, from May 2020 to April 2021 for a period of 1 year. Informed consent was taken directly from conscious patients and from the attendance of unconscious patients. All confirmed diagnoses were by CT scan or MRI of the brain. It is categorized as ischemic stroke, intracerebral hemorrhage (ICH), and subarachnoid hemorrhage (SAH). Hypertension, diabetes mellitus, and ischemic heart disease were considered as common comorbidities. Stage II or III hypertension, isolated systolic hypertension stage II, altered level of consciousness (GCS 08 or less), previous stroke, and large stroke size were all considered prognostic factors. British Hypertension Society, diabetes was defined as known cases with or without drugs, and new cases by the American Diabetic Association 2020 guideline and ischemic heart disease by known cases or new evidence of ischemia by ECG. Patients were excluded who could not fulfill the above diagnostic criteria. Other essential laboratory tests were done

as needed. Hospital outcome variability was classified as static, improved, deteriorated, referred, death and discharge on request, or risk bond. On a computer, the collected data were edited and analyzed using the SPSS 26 software program.

Results:

In this study, 228 patients were included and amongst them, males (68.42%), females (31.58%) and the male-to-female ratio were (2.1:1). Most of the patients were aged above 60 years (68.86%). Table I

Table I
Age and sex distribution (n=228)

Age	Numbers (%)
<60 years	71(31.14)
>60 years	157(68.86)
Sex	
Male	156(68.42)
Female	72(31.58)

The most common variety of stroke was ischemic (61.40%) and then intra-cerebral hemorrhage (34.21%). There were fewer cases of subarachnoid hemorrhage (4.79%) in Table II.

Table II
Types of stroke (n=228)

Types	Numbers (%)
Ischemic stroke	140(61.40)
Intra-cerebral hemorrhage	78(34.21)
Sub arachnoid hemorrhage	10(4.79)

Common isolated comorbidities were hypertension, diabetes and ischemic heart disease (48.68%, 34.64% and 5.70% respectively). Among concomitant comorbidities, hypertension and diabetes were common (42.10%), hypertension, diabetes and ischemic heart disease (23.24%), diabetes and ischemic heart disease (17.10%), and hypertension and ischemic heart disease (10.52%). Comorbidities were absent (7.01%) in Table III.

Table III
Shows the associated comorbidities (n=228).

Isolated common comorbidities(n=212)		Concomitant comorbidities(n=212)	
Comorbidities	Numbers (%)	Comorbidities	Numbers (%)
Hypertension	111(48.68)	HTN and DM	96(42.10)
Diabetes mellitus	79(34.64)	HTN, DM and IHD	53(23.24)
Ischemic heart disease	13(5.70)	DM and IHD	39(17.10)
Past history of stroke and others	09(3.94)	HTN and IHD	24(10.52)
Comorbidities absent = 16(7.01)			

In hospital outcomes, most patients improved and were discharged eventfully (41.22%), their condition deteriorated (17.98%), remained static (14.03%) or died (13.59%) in Table IV.

Table IV
Hospital outcome (n=228)

Parameters	Numbers (%)
Improved and discharged	94(41.22)
Deteriorate	41(17.98)
Static and discharged	32(14.03)
Death	31(13.59)
Referred	20(8.77)
Discharge on request or risk bond	10(4.38)

Discussion:

Stroke is a global health problem and a common cause of death and disability. The incidence of stroke increases with age and further increases in the presence of comorbidities. A total of 228 patients were included in this study, where the incidence is higher at age > 60 years (68.86%). But in the Indian subcontinent, young stroke patients constitute about 20% of total stroke patients.^{11,12} Male patients were more than females (68.42% vs 31.58% and the ratio was 1.2:1). This result correlates with the study done by Badiuzzaman M et al.¹³

Regarding the types of stroke, ischemic stroke accounts for about 2/3rd of total cases worldwide. In this study, 61.40% of patients had ischemic stroke, 34.31% had ICH, and 4.79% had SAH. This variation in our study due to the clinical presentations of ICH compelled them to get admit into the hospital. This result is similar to the study done by Khan M M Z et al.¹⁴ in Bangladesh and a study done by Kapoor D et al.¹⁵ in North India.

There are modifiable and non-modifiable risk factors for stroke. Among non-modifiable risk factors such as age, male sex, and race, which we cannot prevent, but modifiable risk factors such as hypertension, diabetes, smoking, dyslipidemia, and various types of heart disease, which we can prevent and control to some extent, and which will reduce the incidence of such devastating diseases. So control of these factors also improves hospital outcomes. In this study, some common risk factors were found hypertension (48.68%), diabetes (34.64%), ischemic heart disease (5.70%), previous stroke (3.94%) and 7.01% had no risk factors. This result almost correlates with other studies in Bangladesh and

Pakistan by Khan M M Z et al, Khan J et al and Vohra's reports^{14, 16, 17}. They found that hypertension is the most common risk factor for stroke.

The management of acute stroke patients in hospitals has variable duration and lasts from one week to two weeks on average^{18, 19}. Longer stays are more common in the presence of advanced age, severe stroke, altered level of consciousness, and concomitant comorbidities.¹⁸⁻²⁰ Prolonged hospital stays raise healthcare costs and increase the risk of hospital-acquired complications.²⁰ Most of the patients were improved and discharged (41.22%), deteriorated (17.98%), remained static (14.03%) and death occurred in (13.59%). Another study done by H Zaman²¹ found that 64.9% of patients improved and were discharged while 35.1% expired. This result did not correlate with my study. In our study, the recovery rate and death rate are both lower due to short stays in hospitals, early discharges, and leaving hospitals before death when conditions deteriorate and some patients are referred to specialized centers.

Conclusion:

Ischemic stroke where more common in our study and the male were more affected. The most common risk factor of stroke among the included studies was hypertension followed by diabetes mellitus and ischemic heart disease. Our pooled result showed that majority of the patients were improved and discharged eventfully and around one sixth of stroke patients have died during hospitalization. So screening program of risk factors of stroke in community is needed in a large scale in future to prevent mortality and morbidity of our population from such devastating disease.

Limitation of the Study:

The study was a hospital based and only a small number of respondents were taken. Patients from all socioeconomic status and all parts of the country did not come to seek medical attention in the study place. Due to financial constrain much of the tests was not possible to cross check the results of serological findings for acute precision and accuracy. It will be more authentic if this study can be done on a large population group in more institutions with longer duration of study.

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Declaration of interest:

The authors report no conflict of interest.

Ethical consideration:

The study was conducted after approval from the ethical review committee. The confidentiality and anonymity of the study participants were maintained.

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