Original Article

Study of Comorbidities Among Stroke Patients Admitted In A Tertiary Level Hospital

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Abstract

Introduction: *Stroke is an important cause of disability among adults and is one of the leading causes of death worldwide. The reported prevalence of stroke in Bangladesh is 0.3%. Stroke patients have comorbidity Comorbidity is an important factor in stroke outcomes and burden.* ***Objectives:*** *This study was carried out with a view to find out the common comorbidities prevalent in stroke patients.* ***Materials and Method:*** *This cross-sectional study was carried out in Faridpur Medical College Hospital from November 2018 to April 2019 to see the comorbidities and associated factors among admitted stroke patients. A total of 390 stroke patients were included. Data were collected by detailed history from patients or their relatives followed by thorough physical examination;* ***Results:*** *Among total respondents, majority was male (56.4%) and ischemic stroke was the commonest type of stroke (65.6%) diagnosed. The substantial number of patients (85.6%) had one or more comorbidities. Hypertension was the predominant comorbid condition (74.1%) followed by coronary heart disease ((19.5%), diabetes mellitus (17.4%), obesity (6.2%), hyperlipidemia (6.2%), CKD (4.9%), COPD (3.3%), malignancy (0.8%), hypothyroidism (0.5%),CLD (0.5%) and parkinsonism (0.3%). Comorbidities were present in 88.28% of ischemic stroke,81.81% of intracerebral haemorrhage and 69.23% of subarachnoid hemorrhage cases. Patients with first stroke event have comorbidities in 83.64% cases where as in 95.45% cases of recurrent stroke patients. The relationship between comorbidity and mortality risk is not clear with approximately 16% death in both with or without comorbidity.* ***Conclusion:*** *The results of the study concluded that the prevalence of comorbidities in stroke patients remains high in our settings and the patients with increasing age and those with recurrent stroke events have statistically significant number of comorbid conditions.*

Keywords: *Stroke, Comorbidity.*

Introduction

Stroke is a leading cause of death and disability globally. It is the second most common cause of death worldwide (9.7% of all deaths) and is the third leading cause of death in Bangladesh. The reported prevalence of stroke in Bangladesh is 0.3%.[1, 2]

With increasing life expectancy, urbanization, and evolving patterns of lifestyle changes, health system of Bangladesh is now facing an additional threat from non-communicable diseases like heart disease, stroke, and cancer. The lack of information about stroke characteristics in Bangladesh highlights the importance of the present study on stroke that includes demographic characteristics, comorbidities and associated factors among hospitalized stroke patients in the designed population.

Stroke is defined as "a focal (or at times global) neurological impairment of sudden onset, and lasting more than 24 hours (or leading to death) and of presumed vascular origin".[3] Stroke patients have comorbidity which is defined as the coexistence of more than one different condition in the same individual. While some chronic disorders coexist due to a common mechanism of pathogenesis (e.g. diabetes mellitus and related vascular problems), some disorders may coexist in spite of the lack of a determined common underlying pathogenic mechanism .Comorbidity may also be related to factors such as age, gender, education level, marital status, family structure and lower socioeconomic status.[4] Magwood GS et al.stated in a study on stroke-Related Disease Comorbidity that approximately 57% of the sample reported having hypertension; 33%, high cholesterol; 13%, diabetes; and 7%, heart disease.[5] In addition, there are other comorbidities

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associated with stroke such as overweight and obesity, COPD, all stages of chronic kidney disease (CKD)and Cirrhosis.[6-10]

Comorbidity is an important factor in stroke outcomes and burden. Patients with stroke have a number of other chronic diseases, making comorbidity common in stroke. Evidence suggests that a stroke occurs in isolation-no comorbid conditions-in less than 6% of patients. This makes treatment and recovery for stroke increasingly complex as poorer outcomes for stroke patients are associated with comorbidity.[11]

Materials and Methods

This cross-sectional study was carried out in the Department of Medicine of Faridpur Medical College from November 2018 to April 2019 with prior approval of ethical committee. All clinically suspected stroke patients confirmed by neuroimaging (CT/MRI) were included as cases. Patients with cerebral venous sinus thrombosis, cerebral disorders due to traumatic, tumoral or infectious etiologies and those who did not give consent were excluded. Cases had been recorded irrespective of age and sex.Data were collected by detailed history from patients or their relatives followed by thorough physical examination; then those were checked, verified for consistency and edited for result. After editing and coding, the coded data were analyzed by using the SPSS\PC software package.

Results

A total of 390 stroke patients were included in the study; 220 (56.4%) were male and 170 (43.6%) were female with a male female ratio of 1:0.77. Age of patients ranged between 18-110 years with mean age of 63.31 year. Maximum patients (75.6%) lie in 50-75 year age group. Considering the stroke events, 83.1% patients presented for the first time and16.9% with recurrent stroke. Most of the patients presented with ischemic stroke (65.6%) followed by intracerebral hemorrhage (31%), and subarachnoid hemorrhage (13%) respectively. Hypertension was the predominant comorbid condition (74.1%) followed by coronary heart disease ((19.5%), diabetes mellitus (17.4%), obesity (6.2%), hyperlipidemia (6.2%), CKD (4.9%), COPD (3.3%), malignancy (0.8%), hypothyroidism (0.5%),CLD (0.5%) and parkinsonism (0.3%).

Regarding comorbidity, 85.6% patients have one or more comorbidity and 14.4% presented in isolation (Table I).

Table I: Distribution of patients according to comorbidity (n=390)

Comorbidity	Frequency (%)
No comorbidity	56 (14.4)
Comorbidity/comorbidities present	334 (85.6)

Hypertension was the predominant comorbid condition (74.1%) followed by coronary heart disease ((19.5%), diabetes mellitus (17.4%), obesity (6.2%), hyperlipidemia (6.2%),

CKD (4.9%), COAD (3.3%), malignancy (0.8%), hypothyroidism (0.5%), CLD (0.5%) and Parkinsonism (0.3%).

Considering age, 76.19 % of below 50 year, 88.14% of 50-75 year and 79.25% of above 75 year age group had one or more comorbidities (Table II).

Table II: Distribution of comorbidity in relation to age (n=390)

Age group	No comorbidity	Comorbidity Present (%)	Total	p value*
Below 50 year	10	32 (76.19)	42	0.043
50-75 year	35	260 (88.14)	295	
Above 75 year	11	42 (79.25)	53	

*Test was carried out by χ^2 test. df =2

Considering sex, 87.27% of male patients and 83.53% of female patients had one or more comorbidities (Table III).

Table III: Distribution of comorbidity in relation to sex (n=390)

Sex	No comorbidity	Comorbidity Present (%)	Total	p value*
Male	28	192 (87.27	220	0.296
Female	28	142 (83.53)	170	

*Test was carried out by χ^2 test. df =1

Considering stroke type, 88.28% of ischemic stroke patients, 81.81% of hemorrhagic stroke patients and 69.23% of subarachnoid hemorrhage patients had comorbidities (Table IV).

Table IV: Distribution of comorbidity in relation to Stroke type (n=390)

Stroke type	No comorbidity	Comorbidity Present (%)	Total	pvalue*
Ischemic stroke	30	226 (88.28)	256	0.057
Intracerebral hemorrhage	22	99 (88.81)	121	
Subarachnoid haemorrhage	4	9 (69.23)	13	

*Test was carried out by χ^2 test. df =2

Regarding stroke event, 83.64% of first stroke and 95.45% of recurrent stroke patients had comorbidities (Table V).

Table V: Distribution of comorbidity in relation to Stroke Event (n=390)

Stroke type	No comorbidity	Comorbidity Present (%)	Total	pvalue*
First stroke	53	271(83.64)	324	0.013
Recurrent stroke	3	63 (95.45)	66	

*Test was carried out by χ^2 test. df =1

Considering outcome, 16.47% of stroke patients with one or more comorbidities and 16.07% of stroke patients with no comorbidity expired (Table VI)**.**

Table VI: Distribution of comorbidity in relation to outcome: (n=390)

Comorbidity frequency	Discharged	Death (%)	Total	p value*
No comorbidity	47	9 (16.07)	56	0.941
Comorbidity present	279	55 (16.47)	334	

*Test was carried out by χ^2 test. df =1

Discussion

In this study a total of 390 stroke patients were included and demographic as well as pertinent data regarding stroke including common comorbidities were collected. Most patients were male (56.4%) and ischemic stroke being the predominant type which is well-established in almost all stroke studies. The substantial number of patients (85.6%) had one or more comorbidities which are mostly consistent with a previous study where all stroke patients had comorbidity.[4] Considering stroke type, comorbidities were present in 88.28% ischemic stroke, 81.81% of intracerebral haemorrhage, 69.23% of subarachnoid haemorrhage cases. Patients with first stroke event had comorbidities in 83.64% cases where as in 95.45% cases of recurrent stroke patients. Hypertension was the predominant comorbid condition (74.1%) which is consistent with a previous hospital based study (52.05%cases).[12] Other comorbid conditions found in this study were as follows, coronary heart disease ((19.5%), diabetes mellitus(17.4%), obesity(6.2%) hyperlipidemia (6.2%), CKD (4.9%), COAD(3.3%), alignancy (0.8%) Hypothyroidism (0.5%), CLD (0.5%) and Parkinsonism (0.3%).These findings were closely related to recent research conducted by Paker N et al which revealed that stroke and vascular system disorder including hypertension were most frequent comorbidity (94.2%), followed by endocrine system disorders such as diabetes mellitus, obesity and osteoporosis(76.9%) and psychiatric disorders. In another study as cited by the same author, the most frequent comorbid conditions in patients with acute stroke were reported as hypertension, constipation, hyperlipidemia, diabetes mellitus and electrocardiographic abnormalities, respectively; these findings are also relevant with present study.[4] The findings of the study were also related to a study conducted by Magwood GS, et al. on young stroke patients (<55 years) in which approximately 57% of the sample reported having hypertension; 33%, high cholesterol; 13%, diabetes; and 7%, heart disease.[5] The relationship between comorbidity and mortality risk is not clear with approximately 16% death in both with or without comorbidity; this is consistent with previous study conducted by Paker N et al.[4]

Conclusion

Stroke is an important cause of disability and death worldwide. Comorbidity is common in stroke patients. In this study, the comorbid conditions frequently associated with stroke were hypertension, coronary heart disease, diabetes, obesity, hyperlipidemia, and CKD. There was no significant relation between comorbid conditions and in hospital mortality. The identification of these findings may be useful in terms of identifying and implementing preventive measures.

Acknowledgement

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