

Clinical Profile of Ischemic Stroke in Type 2 Diabetic Patients: Experience in a Tertiary Care Hospital

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Abstract

Background: Stroke is the third highest cause of morbidity and mortality in the world. Diabetes mellitus increases risk of ischemic stroke. Stroke in diabetic patients is different from stroke in non-diabetics in several perspectives. This cross-sectional study was carried out to observe clinical profile of ischemic stroke in Type 2 diabetic patients.

Materials and Methods: This cross-sectional observational study was done in the Department of Neurology, BIRDEM General Hospital from April to September, 2010. Non-probability purposive sampling was used.

Results: A total number of 50 subjects were included, all were hospitalized ischemic stroke with type- 2 diabetic patient. Maximum number (36.0%) of the patients was in between 61 to 70 years age group with mean age 59.9 ± 13.9 years. There was male predominance and male-female ratio was 1.5: 1. Majority of the patient (50%) noticed features of stroke at morning (6 am-12.00 noon). Regarding risk factor profile, 35(70%) had uncontrolled DM, 35(70%) used to lead sedentary lifestyle, 30(60%) had history of tobacco use, 20(40%) had Obesity and 42(84%) were hypertensive. A Few cases 5 (10%) were alcoholic. Most (90%) of the patients admitted with weakness at either half of body. Some had difficulties in speech (80%), altered consciousness (24%), difficulties in swallowing (4%); rest of the patients had facial weakness (4%) and others (2%). 94.0% patient had regular pulse, 6% had irregular pulse. 80.0% had high blood pressure on admission. Mean systolic and diastolic blood pressure was 153 ± 5.3 mm of Hg and 97 ± 4.4 mm of Hg respectively. 40.0% patient had abnormal fundoscopy (Diabetic and/or hypertensive retinopathy). Carotid bruit was found in 2% case but one had sign of dyslipidaemia. 76% was conscious and oriented, 24% altered conscious level, 90% had hemiplegia or hemiparesis, 72% had dysarthria, 4% had dysphasia and 16% others.

Conclusion: Elderly and male people are more prone to develop ischemic stroke. Hemiparesis or hemiplegia, dysarthria is the major clinical presentation and high blood pressure is an important risk factor for ischemic stroke. Further study can be done to compare the clinical profile between diabetic and non-diabetic populations.

Key words: Clinical profile; Ischemic stroke; Diabetes mellitus.

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Introduction

Stroke is defined as focal neurological deficit of cerebrovascular cause that persists beyond 24 hours or is interrupted by death within 24 hours.¹ The syndrome is highly heterogeneous with etiological factors influencing its prognosis.² Diabetes Mellitus (DM) is a modifiable risk factor for ischemic stroke.³ In people with type 2 diabetes mellitus, there is a 2 to 5 fold increased risk for stroke compared with those without diabetes.⁴ Modifiable risk factors for stroke include

hypertension, diabetes mellitus, hyperlipidemia, cigarette smoking, cardiac disease, drug abuse, heavy alcohol consumption and acquired immune deficiency syndrome (AIDS).⁴ Risk factors for stroke in diabetic patients include elevated blood pressure, smoking, age, male sex, atrial fibrillation and hyperglycemia.⁵ In recently published observation of 5017 patients with different types of ischemic stroke, the prevalence of diabetes was significantly higher in subjects with small vessel cerebrovascular accidents (35.5%) compared to patients with large vessel atherosclerosis (29.0%) or cardio-embolic (28.1%), while it was less common in subjects with other combined etiologies of stroke (9.4%).⁶ Diabetic persons with retinopathy and autonomic neuropathy appear to be a group of particular high risk for ischemic stroke. Type 2 diabetics are at increased risk for stroke compared to Type 1 diabetic patient.⁷ Hyperglycemia at acute stroke setting have shown to have higher mortality and poorer outcome, whether or not the cause of the hyperglycemia is due to stress, newly diagnosed diabetes or known diabetes.⁸ Although atherosclerosis is an independent risk factor for cerebral ischemia in diabetes, additional factor such as chronic impairment of cerebral blood flow and cerebral auto regulation, reduced red cell deformability, hyperviscosity, endothelial dysfunction impaired prostaglandin synthesis may contribute a major aggravating factor in this population.⁹

Diabetes is an independent risk factor of death from stroke. Tuomilehto et al¹⁰ calculated that 16% of all stroke mortality in men and 33% in women could be directly attributed to diabetes. However, one local study could not show much difference in the outcome in the diabetics versus non diabetics. Though there is extensive data on diabetic retinopathy, neuropathy and peripheral vascular disease, there is not enough data on pattern of stroke in type 2 diabetics.¹¹ As there is a paucity of local data on this topic, this study is therefore planned to identify patterns of stroke in our population with diabetes mellitus.

Materials and Methods

It was a cross-section observational study, done in Department of Neurology, BIRDEM General Hospital, Dhaka. Fifty cases were included through purposive sampling from April to September, 2010. Inclusion criteria were patients with ischemic stroke with type 2 DM confirmed clinically and by imaging. Patients of type 1 diabetes mellitus and patients not willing to participate in the study were excluded. Data was recorded in a

predesigned case record form. Informed consent was taken from patient or attendant of the patient for participation in the study.

Results

Total patients were 50, males were 30 and females were 20. Mean age of the patients was 59.9 years. Maximum patients were in 61-70 years age group (table I). There was male predominance with male-female ratio of 1.5: 1.

Table I

Age distribution of the study subjects (N=50)

Age group (years)	Frequency	Percentage
40 or less	0	0
41-50	10	20
51-60	14	28
61-70>70	1808	3616

Mean \pm SD Range (min - max) 59.9 \pm 13 (33 - 75)

Majority of the patient (50%) noticed features of stroke at morning (6 am-12.00 noon), and timing in other patients are shown in table II. Regarding risk factor profile, 35 (70%) had uncontrolled DM and other risk factors are shown in table III.

Table II

Showing time of stroke3 onset (N=50)

Time of stroke	Number	Percentage
12.01 am-6 am	10	20
6.01am-12.00 noon	25	50
12.01pm-6pm	8	16
6.01 pm-12.00 mid-night	7	14

Table III

Risk factors of ischemic stroke (N=50)

Risk factor	Number	Percentage
Over weight	20	40
Uncontrolled DM	35	70
Hypertension	42	86
Tobacco use	30	60
Alcoholism	5	10
Sedentary lifestyle	35	70

Most (90%) of the patients were admitted with weakness of either half of body. Some had difficulties in speech (80%). Other presenting features are shown in Table IV.

Table IV*Presenting problem of the patients (N=50)*

Admission reason	Number	Percentage
Weakness at half of body	45	90
Facial Weakness	2	4
Difficulties to speak	40	80
Difficulties in swallowing	2	4
Altered consciousness	12	24
Convulsion	0	0
Others	2	4

All had more than one symptom

Table V*Clinical features of ischemic stroke patients after admission (N=50)*

Clinical Feature	Number	Percentage	Mean
Pulse	Regular	47	94.0
	Irregular	3	6.0
Systolic BP(mmHg)	<140	10	20.0
	≥160	25	50.0
Diastolic BP(mmHg)	<90	08	16.0
	≥100	22	44.0
Fundoscopy	Normal	13	26.0
	Abnormal	20	40.0
	Could not be done(i.e. Hazy media)	17	34.0
Carotid bruit	1	2.0	
Sign of dyslipidemia	0	00	

Table VI*Neurological examination finding in ischemic stroke*

Neurological findings	Number	Percentage
Conscious and oriented	38	76
Altered consciousness	12	24
Hemi paresis/hemiplegia	45	90
Dysarthria	38	72
Dysphasia	02	04
Cranial nerve palsy	00	00
Others	08	16

Out of 50 patients, 3 (6%) had irregular pulse, 40 (80.0%) had high blood pressure. Mean systolic and diastolic blood pressure was 153 ± 5.3 and 97 ± 4.4 mm of Hg respectively. Twenty patients (40%) had abnormal fundoscopy (diabetic and/or hypertensive retinopathy) and 1(2%) had carotid bruit (Table V). Thirty eight (76%) was conscious and oriented, 45 (90%) had hemiplegia or hemiparesis, 36 (72%) had dysarthria, and other neurological deficits are shown in Table VI.

Discussion

Incidence of stroke increase dramatically with advancing age and increasing age is the most powerful risk factor for ischemic stroke. The incidence of stroke doubles each decade past 55 years of age. Half of all strokes occur in people older than 70 to 75 years.¹² Men develop ischemic stroke at higher rate than women up to the age 75 years. In our study mean age of the ischemic stroke patients was 59.9 ± 13.9 years. Maximum (36.0%) number of ischemic stroke was between 61 to 70 years age group. These findings are not consistent with study done by Kissella et al.¹³ which revealed increased prevalence of stroke in young diabetics.

Study showed the male preponderance of ischemic stroke. The male female ratio was 1.5: 1, which exactly matched with that of Kissella et al.¹³ Latter study compared this sex distribution with non-diabetic but our study did not.

The diurnal variability of stroke correlates with present study, as half of stroke onset occurred at morning and most occasions when getting up from sleep.¹⁰

Assessing known risk factors, hypertension is twice as prevalent in diabetic as in non-diabetic individuals and in patients with diabetes it is associated with accelerated progression of both micro vascular (retinopathy and nephropathy) and macro vascular (atherosclerotic) complications.¹⁴ Hypertension has long been recognized as the major modifiable risk factor for stroke. Such result in accordance with previous observation emphasizes the fact that diabetes and hypertension are associated.¹⁵ In this study, most of the patient were hypertensive and most had uncontrolled blood pressure. History of smoking was positive in 60% and most was current smoker. A study done in Yemen¹⁵ showed the incidence of smoking was less than that of our study. Other risk factors such as obesity, sedentary life also seemed to present.

Most (72%) of the patients admitted for weakness of one side of body. Next common presentation was difficulties to speak (52%). Other less common presentation was facial weakness (8%), altered consciousness (8%), and difficulties in swallowing. None had history of convulsion. The cause of altered consciousness was not evaluated but may be due to raised intracranial pressure due to massive cerebral infarct, associated metabolic encephalopathy. In our study, the mean systolic blood pressure was 153 ± 5.3 mm of Hg and diastolic blood pressure was 97 ± 4.4 mm of Hg. Only small number of patient had irregular pulse, and only one patient had carotid bruit. None had sign of dyslipidemia clinically.

Diabetic retinopathy is an indicator of micro vascular complication. Patient with diabetes having retinopathy are particular risk for developing ischemic stroke. In this study diabetic and hypertensive retinopathy seemed to more prevalent with ischemic stroke.

Most patients (72%) were conscious and oriented. Hemiparesis or hemiplegia, and dysarthria were the predominant neurological signs among the study group. The various grades of weakness were not brought into consideration in this study.

As the pattern of presentation is more or less same studies¹⁵⁻¹⁸ done previously didn't give emphasis on clinical presentation. In a study, Zafar A et al.¹⁷ showed more lacunar and cortical infarct in diabetic than subcortical and brainstem or cerebellar infarct. Though we didnot assess the CT findings of stroke, most cilinical feature of hemiplegia/hemiparesis (90%), dysarthria (72%), dysphasia (4%) indicative of capsular or cortical infarct. Only few patient (16%) had features of brainstem, cerebellar or subcortical infarct.

Limitation

The limitations of our study were smaller sample size, purposive sampling and single centered study.

Conclusion and recommendation

From this study it might be concluded that, elderly and male diabetics are more prone to develop ischemic stroke. Hemi paresis or hemiplegia, dysarthria are the major clinical presentations; hypertension and smoking are important risk factors for ischemic stroke. Further study can be done to compare the clinical profile between diabetic and non-diabetic populations.

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