



TO STUDY THE SOCIO-DEMOGRAPHIC PROFILE OF ISCHAEMIC STROKE IN RELATION TO THE GLYCAEMIC STATUS AT TERTIARY CARE HOSPITAL IN WESTERN RAJASTHAN

General Medicine

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ABSTRACT

A stroke is defined as an abrupt onset of neurological deficit that is attributable to a focal vascular cause. Majority of stroke are ischaemic while another result from primary haemorrhage either intracerebral or into the subarachnoid space. Stroke gave a history of diabetes more when compared with the general population. Acute stroke patients have either diagnosed or newly diagnosed diabetes, probably a major proportion of patients have stress hyperglycaemia. Diabetics, as well as patients with stress hyperglycaemia, have a severe stroke and these patients are associated with poor prognosis.

KEYWORDS

Stroke, Diabetes, Stress Hyperglycaemia

INTRODUCTION-

A stroke is defined as an abrupt onset of neurological deficit that is attributable to a focal vascular cause. Thus, the definition of stroke is clinical and laboratory studies including brain imaging are used to support the diagnosis.¹

Majority of stroke are ischaemic while another result from primary haemorrhage either intracerebral or into the subarachnoid space. Acute ischaemic stroke is a result of a stroke caused by thrombosis or embolism and is more common than haemorrhagic stroke. Ischaemic strokes constitute 85-87% of all cases.² Haemorrhagic strokes constitute spontaneous intracerebral haemorrhage and subarachnoid haemorrhage and account for the remainder of cases.

Stroke is an illness of escalating socioeconomic importance, especially among the ageing population. According to the Indian Council of medical research, there were 930,985 cases of stroke in India in 2004 and the National Commission of Macroeconomics and Health has estimated that there will be 1.67 million stroke cases in India by 2015.^{2,4}

As reported by Frederic⁵, 11.3% of cases of stroke gave a history of diabetes when compared with 2% in the general population. The incidence of diabetes was found to be twice as high in patients admitted to hospital with any type of stroke than in patients with other neurologic diseases. The increased risk of stroke in diabetes and the increased prevalence rate of stroke in diabetes as compared to the general population were confirmed by a study done by Wolf et al.⁶ Diabetics as well as patients with stress hyperglycaemia have a severe stroke and these patients are associated with poor prognosis. The mortality rate from stroke in diabetics was twice that of the general population.⁷

As reported by several studies, it was found that hyperglycaemia in non-diabetic patients after acute stroke is a stress response reflecting more severe neurological damage.

The prevalence of hyperglycaemia has been observed in two-thirds of all ischaemic stroke subtypes on admission and in at least 50% in each subtype including lacunar strokes. Although up to one-third of acute stroke patients have either diagnosed or newly diagnosed diabetes, probably a major proportion of patients have stress hyperglycaemia mediated partly by the release of cortisol and norepinephrine. It is also a manifestation of relative insulin deficiency, which is associated with increased lipolysis. Even in non-diabetic patients, stress hyperglycaemia may be a marker of deficient glucose regulation in individuals with insulin resistance and developing diabetes mellitus.

MATERIAL AND METHODS-

SOURCE OF DATA:

A group of 100 patients of both sexes consecutively admitted in the

Department of Internal Medicine at DR SN Medical College & MDM Hospital with a stroke within 24 hrs. of an acute event. The diagnosis was based upon the clinical history, the neurological examination and CT/MRI brain findings.

METHODS OF COLLECTION OF DATA:

This prospective study was conducted in the Department of Internal Medicine at DR SN Medical College & MDM Hospital over a period of one year between December 2017 to December 2018. During the study period, all patients presenting with acute cerebrovascular infarction and fulfilling the inclusion criteria were included in the study. A detailed history was taken and clinical examination was done as per Performa and the necessary investigation was done. The results analysed by appropriate statistical methods.

Blood glucose at the time of admission, fasting blood glucose and glycosylated haemoglobin will be measured within a week of admission. Patients will have hyperglycaemia if their blood sugar at the time of admission exceeded 140 mg%. and/or fasting blood sugar \geq 110 mg% and normal HBA_{1C}. Based on the previous history of diabetes according to WHO criteria and initial blood glucose and glycosylated haemoglobin levels, patients are divided into four groups:

1. Euglycaemic
2. Stress hyperglycaemia
3. Newly diagnosed diabetes
4. Known diabetes

INCLUSION CRITERIA:

1. Acute ischaemic stroke presenting within 24 hrs of an acute event.
2. Age >20 years
3. Both sexes

EXCLUSION CRITERIA:

1. Traumatic stroke
2. Transient ischaemic attack.
3. Cerebral venous thrombosis
4. Intracerebral & Subarachnoid haemorrhage
5. Presence of space-occupying lesions on CT scan / MRI brain.

TOOLS OF THE STUDY:

1. Socio-demographic profile
2. Clinical Performa
3. Investigations- CBC (complete blood count), FBS (fasting blood sugar), RBS (random blood sugar), Hb1 AC (glycosylated haemoglobin), CT Scan / MRI of Brain.

Blood glucose is measured by the glucose oxidase method & the glycosylated haemoglobin is measured by ion-exchange resin method using a commercially available kit.

Statistical analysis-Collected data will be analysed with appropriate statistical tests (SPSS version 23). The statistical test used in our study were 't' test and Pearson's coefficient.

RESULTS-

TABLE 1: Age Distribution of cases

Age (years)	No. of patients	Percentage
21-35	7	7.00
36-50	19	19.00
51-65	36	36.00
66-80	32	32.00
≥81	6	6.00
Total	100	100.00

The mean age of the patients in the study group was 60.56 years. The maximum number of patients of stroke belonged to age groups 51-65 years (36%) followed by 66-80 years. (32%).

TABLE 2: Sex Distribution

Sex	No. of patients	Percentage
Male	63	63.00
Female	37	37.00
Total	100	100.00

In this study, 63 % of the cases were males and 37 % were females. There was a male preponderance with a male: female ratio 1.70:1

TABLE 3: Glycaemic status in the study group

Glycaemic status	No. of patients	Percentage
Euglycaemic	39	39.00
Stress hyperglycaemia	36	36.00
Newly diagnosed diabetic	8	8.00
Known diabetic	17	17.00

In the study group, 39% were euglycaemic, 36% had stress hyperglycaemia, 17% had known diabetics and 8% had newly diagnosed diabetics.

TABLE 4: Glycaemic status in the different sex group

Glycaemic status	Male		Female		Total
	N	%	N	%	
Euglycaemic	25	39.68	14	37.84	39
Stress hyperglycaemia	20	31.75	16	43.24	36
Newly diagnosed diabetic	6	9.52	2	5.41	8
Known diabetic	12	19.05	5	13.51	17
Total	63	100.00	37	100.00	100

P value 0.617

Among the study subjects, there was a higher percentage of euglycaemia in males (39.68%) and a higher percentage of stress hyperglycaemia in female patients (43.24%).

TABLE 5: Glycaemic status in the different age group

Glycaemic status	Age (years)				
	21-35	36-50	51-65	66-80	≥81
Euglycaemic	5	11	10	12	1
Stress hyperglycaemia	2	6	16	10	2
Newly diagnosed diabetic	0	1	1	5	1
Known diabetic	0	1	3	11	2
Total	7	19	30	38	6

P value 0.067

Stress hyperglycaemia is more common in the age group 51 to 65 year (44.44%) followed by 66 to 80 years of age. (27.77%)

TABLE 6: Admission blood glucose in various glycaemic groups

Blood glucose (mg/dl)	Euglycaemic	Stress hyperglycaemia	Newly diagnosed diabetic	Known diabetic
≤100	12 (30.77%)	0	0	0
101-150	27 (69.23%)	5 (13.89%)	0	0
151-200	0	22 (61.11%)	5 (62.50%)	4 (23.53%)
201-250	0	4 (11.11%)	1 (12.50%)	2 (11.76%)

251-300	0	3 (8.33%)	1 (12.50%)	6 (35.29%)
>300	0	2 (8.33%)	1 (12.50%)	5 (29.41%)
Total	39	36	8	17

The admission blood glucose in the study group ranged from 76-380 mg %. Only 8 patients had blood glucose level >300 mg/dl.

TABLE 7: Comorbid risk factors

Risk factor	Euglycaemic	Stress hyperglycaemia	Newly diagnosed diabetic	Known diabetic	P value
HT	14 (35.90%)	6 (16.67%)	3 (37.50%)	12(70.59%)	0.002
CVA	2 (5.13%)	2 (5.56%)	0	2(11.76%)	0.664
IHD	6 (15.38%)	0	1 (12.50%)	0	0.035
Smoking	18 (46.15%)	12 (33.33%)	3 (37.50%)	6 (35.29%)	0.698

Smoking and hypertension were a common risk factor for stroke. Smoking was present in 39% of patients while hypertension was in 35%. In known diabetic patient hypertension was present in 70.59% patients and in euglycemic group smoking was present in 46.15% patients.

DISCUSSION-

This prospective study was conducted in the Department of Internal Medicine at DR S.N. Medical College & MDM Hospital over a period of one year December 2017 to December 2018. During the study period, all patients presenting with acute cerebrovascular infarction and fulfilling the inclusion criteria were included in the study.

The age group of the patients ranged from 21-86 years with the mean age 60.56 years, the maximum distribution of cases was in the age group of 51 to 65 years followed by 66 to 80 years. In UKPDS study, it was noted that advancing age was an important risk factor for stroke.⁹⁶ There were 63% male and 37% female patients with a male preponderance and Male: Female ratio of 1.70:1. The UKPDS study noted male sex as an important risk factor for stroke.⁹⁶

The glycaemic status in the study group revealed 39% euglycaemic, 36% stress hyperglycaemia, 17% diabetes and 8% newly diagnosed diabetics patients. Stress hyperglycaemia in this study was defined by their blood sugar at the time of admission exceeded 140 mg%. and/or fasting blood sugar ≥ 110 mg% and normal HBA_{1c}.

The prevalence of diabetes in this study was 25%. Among the study subjects, there was a higher percentage of euglycaemia in male (39.68%) and a higher percentage of stress hyperglycaemia in female patients (43.24%).

The admission blood glucose ranged from 76-380 mg% in the study group, of the total 100 patients, 61 patients had glucose in the range >140 mg%. (61%).

CONCLUSION-

Hyperglycaemia was a common finding in patients with acute ischaemic stroke with or without a history of diabetes.

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