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Original Research Article

Clinical profile of acute ischemic stroke in type 2 diabetes mellitus

Madhu K R[1], Ayyali Ambresh[2,*]

[1]*Dept. of General Medicine, J.J.M Medical College, Davangere, Karnataka, India*
[2]*Dept. of General Medicine, Shri Atal Bihari Vajpayee Medical College, Bangalore, Karnataka, India*

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ABSTRACT

Introduction: Stroke is the second leading causes of death worldwide and approximately 80% of strokes are due to ischemic cerebral infarction and 20% due to brain haemorrhage. Diabetes Mellitus is a very common metabolic disorder and it is an independent risk factor for stroke. Glucose intolerance in a stroke patient may or may not reflect glycemia prior to the event. This study is to assess the clinical profile of Acute Ischemic stroke in type 2 Diabetes Mellitus.
Objectives: To evaluate the clinical profile of acute ischemic stroke in type 2 Diabetes Mellitus.
Materials and Methods: This a cross sectional descriptive study.
Results: This is an cross sectional study including 64 patients.Maximum number of patients were in the age group of 60 – 69 years, with mean age of 63.59±12.59 years.The male to female of 1.37:1. There were 25 patients (39.1%) well controlled Diabetes patients, 16(25.0%) fairly controlled and 23 (35.9%) were poorly controlled Diabetic patient. The common risk factors were Diabetes mellitus, hypertension, smoking, dyslipidemia, Rheumatic heart disease and Retroviral disease.HbA1c should be considered as an independent risk factor for poor clinical outcome and worse prognosis.Early diagnosis and treatment of diabetes including lifestyle modification and periodic monitoring of HbA1c levels may reduce the development of stroke and morbidity and mortality associated with it.
Conclusion: Commonest clinical presentation was motor weakness (100%), cranial nerve dysfunction(45.3%), altered sensorium (29.7%), language disturbances (45.3%), sensory impairment(26.6%).

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1. Introduction

Stroke is the second leading causes of death worldwide and one of the leading causes of disability. The most common cause of stroke is represented by cerebral ischemia and approximately 80% of strokes are due to ischemic cerebral infarction and 20% due to brain haemorrhage.[1] Diabetes Mellitus is a very common metabolic disorder and it is an independent risk factor for stroke and is associated with 2 to 6 fold increased risk compared with non-diabetic subjects and worsens survival of patients with acute stroke.

Approximately 20% of patients with Diabetes die from stroke. [(2)]Stroke is more commonly seen in Males when compared to females.[2,3] The mechanism is believed to be accelerated atherosclerosis, which can affect vessels in many distributions, including small and large vessels.[4]

"According with TOAST classification is possible to distinguish various subtypes of ischemic stroke: 1) Large Artery Atherosclerosis (LAAS); 2) Cardioembolic Infarct (CEI); 3) Lacunar Infarct (LAC); 4) Stroke of other Determined Aetiology (ODE); 5) Stroke of Undetermined Aetiology (UDE).[5] "Gertler and his colleagues in a population with thrombotic stroke, found overt diabetes in

* *Corresponding author*.
E-mail address: ambrish7799@gmail.com (A. Ambresh).

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30% and abnormal glucose tolerance (Fajans and Conn criteria) in 59% of the rest.[6,7]

Glucose intolerance or even fasting hyperglycemia may follow an acute vascular event, and ensuing physical inactivity and poor food intake may lead to continued glucose intolerance. Thus, glucose intolerance in a stroke patient may or may not reflect glycemia prior to the event. Measurement of HbA1C rather than glucose as an indicator of prior glycemia offers a new perspective. The rate of non-enzymic glycosylation of hemoglobin is believed to depend largely or solely on plasma glucose concentration.[8] Since the erythrocyte survives about 3 months, HbA1C measurements in patients with normal erythrocyte survival reflect plasma glucose concentrations during that period.

Hence this study is to evaluate the clinical profile of acute ischemic stroke in type 2 Diabetes Mellitus.

2. Aims and Objectives

To evaluate the clinical profile of acute ischemic stroke in type 2 Diabetes Mellitus.

3. Materials and Methods

3.1. Source of data

The information for the study will be collected from Patients with Acute Ischemic Stroke admitted to BLDEU'S SHRI B. M. PATIL MEDICAL COLLEGE HOSPITAL and RESEARCH CENTRE VIJAYAPUR between December 2016 to June 2018.

3.2. Method of collection of data (including sampling procedure if any):

Type of study - Cross sectional study.

With the proportion of stroke 50% at 95%confidence interval & 5%precesion calculated sample size is 64.

It is known that Ischemic stroke accounts for 80%of the Stroke.(67)

$n = Z^2 * p * (1-p)$

e^2 Z - Z value at 95% Confidence interval.

P - proportion rate.

E - margin of error.

Hence 64 Ischemic stroke cases will be included in the study.

3.3. Statistical analysis

Data will be analysed by

1. Mean +_SD
2. Students t test/ Mann whitney U test
3. Correlation coefficient

3.4. Inclusion criteria

1. All male and female cases of acute ischemic stroke.
2. Patients of age more than 18yrs.

3.5. Exclusion criteria

1. Patients of age less than 18yrs.
2. Hemorrhagic stroke.
3. Transient ischemic attacks.
4. Subdural/Epidural haematomas

3.6. Study design

1. Estimation of Random blood glucose and HbA1c levels were done at the time of admission.
2. Patients were scored severity based on NIH stroke scale at the time of admission
3. Hba1c levels <6% indicates well controlled,6-9% indicates fairly controlled,>9% indicates poorly controlled
4. Infarct size on CT/MRI scan brain <3cm^2 is small,3-5cm^2 is moderate and >5cm^2 is large infarct.
5. NIHSS score 0-4 indicates minor stroke, 5-15 indicates mild to moderate, 16-20 indicates severe and 21-42 indicates very severe neurologic impairment.

4. Results

Table 1: Distribution of patients according to Age (Years)

Age (Years)	No. of patients	Percentage
< 40	1	1.6
40 – 49	8	12.5
50 – 59	12	18.8
60 – 69	22	34.4
70 – 79	13	20.3
80+	8	12.5
Total	64	100.0

In this study, maximum number of patients were in the age group of 60-69 years

Next commonest age group is 70 - 79

Table 2: Distribution of patients according to Gender

Gender	No. of patients	Percentage
Male	37	57.8
Female	27	42.2
Total	64	100.0

In this study, 57.8% of the cases were male and rest 42.2 were females. There is male preponderance with male : female ratio of 1.36

In this study well controlled Diabetes has moderate stroke severity, fairly controlled Diabetes has moderate to severe stroke severity and poorly controlled Diabetes has severe stroke. It is observed that severity of the presenting complaints worsened from well controlled Diabetes to poorly controlled Diabetes. The NIHSS score correlates with the HbA1C, with increase in severity of the stroke from well controlled Diabetes to poorly controlled Diabetes.

Table 3: Diabetic status in the study group n=64

HbA1C	No. of patients	Percentage
< 6.00	25	39.1
6.00 - 9.00	16	25.0
9.0+	23	35.9
Total	64	100.0

In this study 39.1% cases were well controlled, 25% were fairly controlled, 35.9% were poorly controlled.

Table 4: Risk factors in our study group

Risk Factors	No. of patients	Percentage
T2DM	13	20.3
T2DM,SM	15	23.4
T2DM,HTN,SM	3	4.7
T2DM,HTN,DYS	5	7.9
T2DM,HTN	18	28.2
T2DM,DYS	7	10.8
T2DM,RHD	2	3.1
T2DM,RVD	1	1.6
Total	64	100.0

In this study, the risk factors were Diabetes mellitus, Hypertension, smoking, Dyslipidemia, Rheumatic heart disease and Retroviral disease.

Table 5: Clinical Presentations in the study group

Motor Deficits	No. of patients	Percentage
Present	64	100
Total	64	100.0

In this study, all 64 patients has motor deficits.

Table 6: Sensory Deficit presentations

Sensory Deficits	No. of patients	Percentage
Present	17	26.6
Absent	47	73.4
Total	64	100.0

In this study, 17 patients has sensory deficits.

Table 7: Distribution of Altered Sensorium

Altered Senosorium	No. of patients	Percentage
Present	19	29.7
Absent	45	70.3
Total	64	100.0

In this study, 19 patients has altered sensorium.

Table 8: Distribution of cranial nerve involvement

Cranial Nerve Involvement	No. of patients	Percentage
Present	35	54.7
Absent	29	45.3
Total	64	100.0

In this study, 35 patients has cranial nerve involvement.

Table 9: Distribution of language Disturbance

Language Disturbance	No. of patients	Percentage
Present	29	45.3
Absent	35	54.7
Total	64	100.0

In this study, 29 patients has language distrubances.

Table 10: Severity of the stroke

Severity	Score	No. of patients	Percentage
Minor stroke	0-4	0	0
Moderate Stroke	5-15	24	37.5
Moderate to Severe	16-20	14	21.9
Severe Stroke	21-42	26	40.6
Total		64	100.0

In this study, moderate stroke is seen in 37.5% of patients, moderate to severe stroke in 21.9% of patients and severe stroke in 40.6% of patients

Table 11: Descriptive Statistics

X	Minimum	Maximum	Mean	Std. Deviation
AGE	35	90	63.59	12.558
NIHSS score	8	35	19.55	7.719
BLOOD glucose on admission	80	420	212.23	88.907
HbA1C	4.50	12.80	7.6766	2.27594

5. Summary

1. This is an cross sectional study including 64 patients.
2. Maximum number of patients were in the age group of 60 – 69 years, with mean age of 63.59±12.59 years.
3. The male to female of 1.37 : 1.
4. There were 25 patients (39.1%) well controlled Diabetes patients,16(25.0%) fairly controlled and 23 (35.9%)were poorly controlled Diabetic patients.
5. The common risk factors were Diabetes mellitus, hypertension, smoking, dyslipidemia, Rheumatic heart disease and Retroviral disease.
6. Commonest clinical presentation was motor weakness.
7. Others were cranial nerve dysfunction, altered. sensorium, language disturbances, sensory impairment. The severity of the presenting complaints worsened from well controlled diabetes to poorly controlled diabetes.

6. Conclusion

1. Commonest clinical presentation was motor weakness (100%)
2. Others were cranial nerve dysfunction (45.3%), altered sensorium (29.7%), language disturbances

(45.3%), sensory impairment (26.6%). The severity of the presenting complaints worsened from well controlled diabetes to poorly controlled diabetes.

3. Patients with poorly controlled diabetes were found to have increased severity of stroke.Severity of the stroke worsened from well controlled diabetes to poorly controlled diabetes.

7. Conflict of Interest

The authors declare that there are no conflicts of interest in this paper.

8. Source of Funding

None.

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Author biography

Madhu K R, Senior Resident

Ayyali Ambresh, Assistant Professor

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