



## PREVALENCE OF DIABETES MELLITUS IN PATIENTS PRESENTING WITH ACUTE ISCHEMIC STROKE IN A TERTIARY CARE CENTRE

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### ABSTRACT

**Introduction:** Stroke is defined as a syndrome of rapid onset of a neurological deficit that is attributable to a focal vascular cause. WHO defines Stroke as rapidly developing clinical signs of focal or global disturbance of cerebral function with symptoms lasting for 24 hours or longer with no apparent cause other than of vascular origin. Diabetes mellitus is one of the major risk factors and accounts for vast number of stroke cases. Blood glucose levels may rise immediately after stroke in response to stress. This study was carried out in our institute to study the prevalence of diabetes mellitus in patients presenting with stroke.

**Aim-** This Study aims to find the prevalence of diabetes mellitus in patients presenting with ischemic stroke in a tertiary care centre

**Materials and Methods-** This is a retrospective type of analytical study with 50 patients who were admitted with history and NCCT Head suggestive of ischemic stroke. The patients were subjected to blood sugar monitoring , HbA1C levels, Fasting and Post Prandial Blood sugar levels, NCCT Head along with detailed history and examination. Patients were divided into Euglycemic, Hyperglycemic and Stress induced Hyperglycemia Individuals.

**Conclusion-** In our study, 28 were males and 22 were females with mean age of  $52 \pm 6.8$  years and  $50 \pm 5.9$  years respectively. Overall Prevalence of Diabetes in our study group was found to be 60% and Post stress hyperglycemia was found in 14% Individuals

### KEYWORDS :

#### INTRODUCTION

Stroke is defined as a syndrome of rapid onset of a neurological deficit that is attributable to a focal vascular cause. WHO defines Stroke as rapidly developing clinical signs of focal or global disturbance of cerebral function with symptoms lasting for 24 hours or longer with no apparent cause other than of vascular origin. Cerebral Infarction is the most commonly caused by thromboembolic disease secondary to atherosclerosis in the major extra cranial arteries and about 20% of infarctions are caused by emboli from heart and about 20% from atherosclerosis in situ due to intrinsic disease of small perforating vessels causing lacunar infarctions.<sup>1</sup>

Diabetes mellitus is one of the major risk factors and accounts for vast number of stroke cases. Blood glucose levels may rise immediately after stroke in response to stress causing Post Stress Hyperglycemia. According to studies, it has been reported that hyperglycemia causes impaired recanalisation, lactic acidosis and reperfusion injuries secondary to mitochondrial dysfunction.<sup>2</sup>

American Diabetes Association have suggested measurement of glycosylated haemoglobin ( HbA1c) as an indicator of diabetic control. HbA1c is formed by the post-transcriptional glycosylation of HbA at the amino-terminal valine of beta chain. When properly assayed HbA1c level in a blood sample gives an estimate of diabetic control for preceding 3-4 month period (i.e. life span of RBC).<sup>3</sup>

This study was carried out in our institute to study the prevalence of diabetes mellitus in patients presenting with stroke.

#### MATERIALS AND METHODS-

This is a retrospective type of analytical study with 50

patients who were admitted in between 1.1.2020 to 31.3.2020 with history and NCCT Head suggestive of ischemic stroke. The patients were subjected to blood sugar monitoring , HbA1C levels, Fasting and Post Prandial Blood sugar levels, NCCT Head along with detailed history and examination. Patients who had symptoms of stroke for over 72 hours were excluded from the study. Patients with epilepsy, subdural hematoma, sub-arachnoid hemorrhage and Intra-cerebral bleed or any other known neurological disability were excluded from the study.

Fasting blood glucose  $> 126$ mg/dL, postprandial glucose  $> 200$ mg/dL or HbA1C  $> 6.5\%$  was considered in hyperglycemic range. Patients were divided into Euglycemic, Hyperglycemic (H/o Diabetes or Newly Detected diabetes) and Post stress hyperglycemia.

Euglycemia- Normal HbA1C, FBS and PPBS Levels.<sup>3</sup>

Hyperglycemia- H/o Diabetes, HbA1C  $> 6.5\%$ , FBS  $> 126$ mg%, PPBS  $> 200$ mg%.<sup>3</sup>

Newly Detected Diabetes- HbA1C  $> 6.5\%$ , FBS  $> 126$ mg%, PPBS  $> 200$ mg%, diagnosed first time during admission<sup>3</sup>  
Post stress hyperglycemia- Deranged Blood sugar levels with Normal HbA1C Levels and return of normal blood sugar levels after 72 hours.<sup>3</sup>

The data was analysed statistically by SPSS Software.

#### OBSERVATION-

**Table 1 - Male-Female & Age Distribution (n=50)**

	MALE N= 28	FEMALE N=22
AGE (YEARS)	$52 \pm 6.8$	$50 \pm 5.9$

In our study total 50 patients with ischemic stroke, 28 were males and 22 were females with mean age of  $52 \pm 6.8$  years and  $50 \pm 5.9$  years respectively.

**Table 2- Comparison of Glycemic Status in stroke patients**

GLYCEMIC STATUS	No. of Patients	FBS (mg%)	PPBS (mg%)	HbA1C (%)
KNOWN DIABETES	21	$164 \pm 24.6$	$189 \pm 33.8$	$8.9 \pm 2.3$
NEWLY DETECTED DIABETES	9	$148 \pm 33.4$	$170 \pm 30.3$	$7.9 \pm 1.1$
POST STRESS HYPERGLYCEMIA	7	$150 \pm 14.1$	$174 \pm 25.9$	$5.4 \pm 0.6$
EUGLYCEMIC	13	$101 \pm 11.6$	$151 \pm 18.9$	$5.9 \pm 0.5$

In our study group, it was found that 21 patients had history of diabetes with mean HbA1c levels of  $8.9 \pm 2.3$  % with mean FBS  $164 \pm 24.6$  mg% and mean PPBS  $189 \pm 33.8$  mg%.

9 patients of Newly detected diabetes had mean HbA1C of  $7.9 \pm 1.1$  % with mean FBS and PPBS of  $148 \pm 33.4$  mg% and  $170 \pm 30.3$  respectively whereas HbA1c of  $5.4 \pm 0.6$  % with FBS and PPBS of  $150 \pm 14.1$  mg% and  $174 \pm 25.9$  mg% respectively was found in Post stress hyperglycemia patients. We had a total of 13 patients with euglycemia as evidenced by FBS, PPBS and HbA1C values. Overall Prevalence of Diabetes in our study group was found to be 60% and Post stress hyperglycemia was found in 14% Individuals.

#### DISCUSSION-

Stroke is a common clinical condition which is encountered in emergency which is most commonly ischemic. Modifiable risk factors like diabetes mellitus, hypertension, smoking if under control have been shown to prevent stroke and its complications. Studies have reported that tight glycemic controls have shown to have better mortality and morbidity benefits. Increased mortality has been noted in patients with hyperglycemia presenting with Stroke.

Our findings are consistent with the findings of Rao KVM et al<sup>4</sup>, suggesting a prevalence of around 80% of their study population with deranged glycemic control. They had included both hemorrhagic and ischemic stroke with accounting of other confounding factors such as smoking, hypertension and dyslipidemia.<sup>4</sup>

Another study by Patil et al reported a prevalence of 21.25% of poor glycemic control among their stroke patients. These findings were inconsistent with our study.<sup>5</sup>

There is impaired autoregulation of cerebral blood flow in diabetics which has been proposed a mechanism for cerebral stroke.<sup>6</sup> It is observed that these patients develop cerebral edema leading to higher lactate content in the brain when compared to patients of stroke with normoglycemia.<sup>7,8</sup>

Therefore for optimization of therapy, it required to maintain strict blood glucose control though there are no recommended guidelines for the same.

#### CONCLUSION-

Diabetes appears to be a major risk factor for stroke with overall prevalence of 60% in our study group and Post stress hyperglycemia of 14 %. Strict control and monitoring of blood sugar levels provides mortality benefit to the patients.

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