

Assessment of Hyperglycemia in Patients Presenting With Acute Ischemic Stroke Without History of Diabetes

Hyperglycemia in Patients With Acute Ischemic Stroke

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ABSTRACT

Objective: To find the frequency of hyperglycemia in patients presenting with acute ischemic stroke without history of diabetes.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Department of Medicine, Services Hospital, Lahore from 1st July 2017 to 31st December 2017.

Materials and Methods: One hundred and seventy five non-diabetic patients with acute ischemic stroke were included. Each patients drawn blood sample and blood glucose level was measured by using glucometer at the time of presentation. Blood glucose level ≥ 200 mg/dl was considered as hyperglycemia.

Results: Out of 175, hyperglycemia was found in 52 (29.7%) cases. 90 (51.4%) patients had ischemic stroke and 85 (48.6%) had hemorrhagic stroke. Out of 95 hemorrhagic stroke, 32 (33.7%) had hyperglycemia and out of 80 ischemic stroke 20 (25%) was also hyperglycemia.

Conclusion: The overall frequency of hyperglycemia is found to be high in stroke patients, although they did not had history of diabetes. Thus we cannot neglect the stroke patients for their blood glucose level, although they are negative for diabetes.

Key Words: Stroke, Ischemic, Glucose, Hyperglycemia

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INTRODUCTION

Stroke is the major cause of disability and death in all over the world.¹ Last ten years the prevalence of stroke was 33 million.² The problem of this disease in Asian countries like India, Bangladesh, Srilanka, Pakistan has increase and is normally to rise as compare to western countries.²

Both hemorrhage and ischemic have caused due to lack of blood flow in blood vessels of brain. Ischemia is develops when there is blockage in blood vessel due to thrombosis, arterial embolism or cerebral hyperfusion.³ Hyperglycemia occurs in those people who have too much sugar in their bloodstream.⁴ Pathological reasons include cerebral infarction, primary intercranial hemorrhage and subarachnoid hemorrhage. In developed countries, 85–90% strokes develops because of cerebral infarction and 10–15% because of intracranial haemorrhage.⁵

Hyperglycemia at time of presentation of patients with

acute ischemic stroke, is usual finding at admission in about 60% cases. This finding is very common in diabetics but now in non-diabetics, it can be observed in many number of cases.^{6,7}

A cross sectional study was conducted in Pakistan DG Khan hospital, out of 150 only 32 had hyperglycemia patients. There was an insignificant relation between ages, gender, and duration of disease with hyperglycemia. Every stroke patient must be screened for hyperglycemia. Its early diagnosis and treatment should be done so as to the morbidity and mortality can be reduced.⁸ A recent study by Jitendra et al⁴ showed that stress hyperglycemia for 20.33% of all the cases with non-diabetics patients. Significant association in stroke patient with stress hyperglycemia and duration of hospital stay.⁹⁻¹²

In USA 80,000 people suffer stroke in each year¹³, out of these 82-90% of these stroke are ischemic. Hemorrhagic stroke develops when blood vessels of brain bleeds outside the vessel.¹⁴ Fayyaz et al, showed that 44(25.73%) hyperglycemia with acute stroke. No significant relation between hyperglycemia and type of stroke and duration disease.¹⁵

All over the world, several studies have been done but there is no local studies available regarding hyperglycemia in non-diabetics presenting with acute ischemic stroke. So we conducted this study to find the occurrence of hyperglycemia and acute ischemic stroke.

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MATERIALS AND METHODS

This cross-sectional study was carried out at Department of Medicine, services Hospital, Lahore from 1st July 2017 to 31st December 2017. One hundred and seventy five non-diabetic patients with acute ischemic stroke were included. All non-diabetics patients who were presented with acute stroke and age between 30 to 70 years of both genders, duration of acute stroke <24 hours were included. Patients had history of diabetes mellitus, head injury, previous steroids use, recurrent attack were excluded. Patients with no history of diabetes in past and HbA1c normal level (<5.5%) on presentation was labeled as non-diabetics. The sign and symptoms of acute stroke according to WHO definition, fast developing symptoms <24 hours duration, speech disturbance, weakness of one side body, loss of unconsciousness (GCS <8/15) and cranial nerve palsy. CT brain was also showed loss of gray white interface, high attenuating bright clot and low attenuating (dark) cerebrospinal fluid (CSF) and normal brain tissue. Blood pressure and BMI of each patients was calculated and also observed hypertension. Each patients drawn blood sample and blood glucose level was measured by using glucometer at the time of presentation. Blood glucose level ≥ 200 mg/dl was considered as hyperglycemia. Statistical analysis was performed using SPSS-21. Qualitative variables like gender, type of stroke, hyperglycemia were presented as frequency and percentage. Mean \pm SD were computed for quantitative variables like age, duration of disease.

RESULTS

The mean age of patients was 50.04 ± 12.05 years. There were 96 (54.9%) males and 79 (45.1%) females. In 85 (48.6%) patients hemorrhagic stroke occurred and 90 (51.4%) cases ischemic stroke occurred. Hyperglycemia was found in 52 (29.7%) patients.

Table No.1: Demographic information of the patients

Variable	No.	%
Age (years)	50.04 ± 12.05	
Gender		
Male	96	54.9
Female	79	45.1
Type of stroke		
Ischemic	90	51.4
Hemorrhagic	85	48.6
Hyperglycemia		
Yes	52	29.7
No	123	70.3

Out of 95 hemorrhagic stroke, 32 (33.7%) had hyperglycemia and out of 80 ischemic stroke 20 (25%) was also hyperglycemia. There were also no significant

difference between hyperglycemia and type of stroke. Mean duration of disease 10.29 ± 6.53 hours. Duration of disease were divided in to two groups ≤ 12 hours and >12 hour. Total 72(43.6%) patients was present ≤ 12 hour, 24(57.1%) was found hyperglycemia and 93(56.4%) was present >12 hour 18(42.9%) was found hyperglycemia (Tables 1-2).

Table No.2: Hyperglycemia with respect to Type of stroke

Type of stroke	Hyperglycemia		Total	P value
	Yes	No		
Hemorrhagic	32 (33.7%)	63 (66.3%)	95	0.2109
Ischemic	20 (25%)	60 (75%)	80	

DISCUSSION

Hyperglycemia is an unusually high blood glucose level in the blood like >140 mg/dl (7.8mmol/l).¹⁰ Hyperglycemia is also seen amongst non-diabetics and can cause significant morbidity and mortality. It was found in 22-46% cases who were not critically ill. Previous researches indicate that hyperglycemia in stroke patients, whether they had diabetes or not, is associated with high risk of morbidity and mortality, prolonged hospital stay, number of ICU admissions increased and the requirement of transitional or nursing home care after hospital discharge also increases.¹¹ In a study conducted by Fayyaz et al¹⁵, hyperglycemia was found 25.73%. This finding is almost near to the results of our study i.e. 29.7% hyperglycemia was found in nondiabetic patients with acute ischemic stroke.

Jitendra et al⁸ observed different results in their study. 20.33% found stress hyperglycemia in non-diabetics presenting with acute stroke. As compare in our study 29.7% found hyperglycemia in non-diabetics presenting with acute ischemic stroke. Significant association hyperglycemia and duration of disease were found.. Sharma et al⁹ observed the prevalence of stroke was 21.8% but our study observed ischemic stroke was 48.5% and hemorrhagic stroke 51.5%. Bilal et al⁸ were found 32 had hyperglycemia patients and no significant association between ages, gender and duration of stay. In our study showed also insignificant association between hyperglycemia with age, gender and stroke but significant association between hyperglycemia and duration of disease.

CONCLUSION

The overall frequency of hyperglycemia is found to be high in stroke patients, although they did not had history of diabetes. Thus we cannot neglect the stroke patients for their blood glucose level, although they are negative for diabetes.

Author's Contribution:

Concept & Design of Study: Ammar Asghar
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Revisiting Critically: Ammar Asghar,
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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