

To Determine the Frequency of Newly Diagnosed Diabetes Mellitus in Patients of Acute Stroke presenting in tertiary care hospital

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ABSTRACT

Aim: To determine the frequency of newly diagnosed diabetes mellitus in patients of acute stroke presenting in tertiary care hospital.

Study design: Cross-sectional survey

Setting: The study was carried out in the Department of Medicine, Mayo Hospital Lahore

Duration: Study was completed in six months time commencing from the approval of synopsis

Results: In our study, 107(43.50%) were between 40-60 years of age and 139(56.50%) were between 61-80 years, mean±sd was calculated as 59.45±11.30 years, 118(47.97%) were male and 128(52.03%) were females. Frequency of newly diagnosed diabetes mellitus presenting in patients of acute stroke presenting in tertiary care hospital reveals 76(30.89%) while 170(69.11%) had no findings of the morbidity.

Conclusion: The frequency of newly diagnosed diabetes is high among patients with ischemic stroke. So, it is recommended that every patient who present with ischemic stroke, should be sort out for diabetes mellitus. However, it is also required that every setup should have their surveillance in order to know the frequency of the problem.

Keywords: Acute stroke, newly diagnosed diabetes mellitus, frequency

INTRODUCTION

Diabetes is a group of metabolic disorders characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both¹. Diabetes Mellitus is a major public health issue that is approaching epidemic proportions globally. The number of diabetics worldwide in the year 2000, among adults more than 20 years of age, was estimated to be about 171 million². Symptoms of marked hyperglycemia include polyuria, polydipsia, weight loss, sometimes with polyphagia, and blurred vision³.

Stroke is characterized by the sudden loss of blood circulation to an area of the brain, resulting in a corresponding loss of neurologic function. Also previously called cerebrovascular accident (CVA) or stroke syndrome. Broadly, however, stroke is classified as either hemorrhagic or ischemic. Acute ischemic stroke refers to that caused by thrombosis or embolism⁴. Stroke is the third leading cause of death in world and 10% of patients with an acute ischemic stroke die within 30 days⁵. Diabetes mellitus remains an independent risk factor of stroke and coronary heart disease. Diabetes is also one of the most consistent predictors of recurrent stroke or stroke after transient ischaemic attack (TIA)⁵. Most

human studies have shown that in acute stroke, admission hyperglycemia in patients with or without diabetes is associated with a worst clinical outcome than in patients without hyperglycemia. Evidence suggests that elevated glucose levels may reflect underlying glucose intolerance or diabetes. Given these facts, hyperglycemia, however, is often ignored in these events as it is solely attributed to physiological stress of acute stroke event⁶. Many studies have reported the frequency of newly diagnosed diabetes mellitus presenting in patients of acute stroke. Zahra F, et al reported among total 250 patients of acute stroke frequency of new cases of diabetes mellitus were 50(20%)⁶. Another local study reported that among 142 patients of acute stroke, 21.1% patients had diabetes mellitus⁷. In another series of 133 patients, 38(28.57%) were diagnosed with newly diabetes mellitus⁸. Jia Q et al, 2012 reported 45.8% patients had diabetes mellitus in patients with ischemic stroke⁹.

In the light of above cited magnitudes the reported frequency of newly diagnosed diabetes mellitus in patients with acute stroke is very inconsistent i.e. 20%-45.8%⁶⁻⁹. Purpose of this study is to find the exact magnitude of newly diagnosis of diabetes in acute ischemic stroke patients. The benefit of this study is early screening and treatment will also reduce both micro and macro vascular complications of diabetes mellitus such as stroke.

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The diagnosis of acute ischemic stroke was made by computerized tomography of brain by documentation of hypodense area. Patients were diagnosed newly Diabetes mellitus on following criteria, a) on basis of negative history of DM b) HbA1c >6.5.

MATERIALS AND METHODS

It was cross-sectional survey and carried out in all general medical wards (East, West, North, South) of Mayo Hospital Lahore for six months with technique of non-probability purposive sampling. The calculated sample size was 246 cases, with 5% absolute precision, 95% confidence level, taking expected percentage of newly Diagnosed Diabetes mellitus in acute ischemic stroke i.e. 20%⁶. All patients of acute ischemic stroke (as per operational definition) having age 40-80 years with either sex were included while all patients presented with history of diabetes mellitus and anti diabetic medicine; all patients with haemorrhagic cerebrovascular accident diagnosed by CT scan and with atrial fibrillation diagnosed on ECG were excluded. All 246 cases of acute ischemic stroke fulfilling inclusion and exclusion criteria were selected from indoor and emergency departments. Informed verbal consent was taken from patient's attendant. HbA1c levels of the patients were carried out in the department of Pathology, KEMU and Clinical Pathology Laboratory, Mayo Hospital Lahore and presence of acute stroke was confirmed by the computerised tomography of brain from Radiology Department of Mayo Hospital Lahore. All information was recorded on a specially designed proforma.

Data was entered in computer programme SPSS version 20. Descriptive statistics were used to determine the frequency of newly diagnosed diabetes mellitus in patients with acute ischemic stroke. Mean and standard deviation was calculated for age. Frequency and percentages were calculated for gender and presence or absence of newly diagnosed diabetes mellitus.

RESULTS

Age distribution of the patients was done which showed that 107(43.50%) were between 40-60 years of age and 139(56.50%) were between 61-80 years, mean±sd was calculated as 59.45±11.30 years. Gender distribution of the patients was done which shows that 118(47.97%) were male and 128(52.03%) were females. Frequency of newly diagnosed diabetes mellitus in patients of acute stroke presenting in tertiary care hospital reveals 76(30.89%) while 170(69.11%) had no findings of the morbidity. (Table 1) Stratification for frequency of newly diagnosed diabetes mellitus in patients of acute

stroke presenting with regards to age shows that out of 76 cases, 42 were between 40-60 years and 34 between 61-80 years, p value was calculated as 0.01. Stratification for frequency of newly diagnosed diabetes mellitus in patients of acute stroke presenting with regards to gender shows that out of 76 cases, 31 were male and 45 were females, p value was calculated as 0.13.

Table 1: Frequency of newly diagnosed diabetes mellitus in patients of acute stroke presenting in tertiary care hospital (n=246)

Newly diagnosed diabetes mellitus	n	%age
Yes	76	30.89
No	170	69.11
Total	246	100

DISCUSSION

Stroke is the second largest contributor to mortality worldwide and the primary cause of disability among the elderly. Among the various types of stroke, ischemic stroke is the most prominent and accounts for the most long-term disability. A stroke is caused by a portion of the brain being starved of oxygen. This can be due to a burst blood vessel or a clot blocking a blood vessel. The lack of oxygen causes damage to the brain. The long-term effects of a stroke depend on what part of the brain and how much tissue is affected. Many studies have reported the frequency of newly diagnosed diabetes mellitus presenting in patients of acute stroke. In our study, 107(43.50%) were between 40-60 years of age and 139(56.50%) were between 61-80 years, mean±sd was calculated as 59.45±11.30 years, 118(47.97%) were male and 128(52.03%) were females. Frequency of newly diagnosed diabetes mellitus presenting in patients of acute stroke presenting in tertiary care hospital reveals 76(30.89%) while 170(69.11%) had no findings of the morbidity.

Our findings are in agreement with a study of 133 patients, 38(28.57%) were diagnosed with newly diabetes mellitus⁸. Our findings are slightly higher than Zahra F, et al who reported among total 250 patients of acute stroke frequency of new cases of diabetes mellitus were 50(20%).⁶ Another local study also support our findings that among 142 patients of acute stroke, 21.1% patients had diabetes mellitus.⁷ Sheikh et al have shown the presence of diabetes in 35.2% of a Pakistani cohort of ischaemic stroke subjects, however, they did not mention the frequency of newly diagnosed diabetes in this study¹⁰. Another study by Jia Q et al, 2012 reported 45.8% patients had diabetes mellitus in patients with ischemic stroke⁹, this magnitude is quite higher than our study. In the Japanese study¹¹ atherothrombotic infarction with previous diabetes accounted for 60.9%

of patients, newly diagnosed DM accounted for 11.2% of patients, IGT accounted for 14.4% of patients, and IFG accounted for 1.2% of patients.

Marjukka et al observed that diabetes, both previously diagnosed and screen-detected, was associated with clearly increased risk of ischaemic stroke¹².

Our results indicate high prevalence of newly diagnosed DM in patients with intracerebral hemorrhage, which suggested that identification of abnormal glucose regulation should be emphasized in patients with ischemic stroke, and OGTT should be performed in all stroke patients without history of diabetes after acute stage of stroke.

The results of the current study in agreement with the above studies indicate that early screening and treatment may reduce both micro and macro vascular complications of diabetes mellitus such as stroke. Considering results of this study, morbidity and mortality events related to diabetes mellitus may be lessened as well.

CONCLUSION

The frequency of newly diagnosed diabetes is high among patients with ischemic stroke. So, it is recommended that every patient who present with ischemic stroke, should be sorted out for diabetes mellitus. However, it is also required that every setup should have their surveillance in order to know the frequency of the problem.

REFERENCES

1. Soler EP, Ruiz VC. Epidemiology and risk factors of cerebral ischemia and ischemic heart diseases: Similarities and differences. *Current cardiology reviews*. 2010;6(3):138-49.
2. Pasquier F. Diabetes and cognitive impairment: how to evaluate the cognitive status? *Diabetes & metabolism*. 2010;36:S100-S5.
3. Wahab S, Mahmood N, Shaikh Zaman, Kazmi WH. Frequency of retinopathy in newly diagnosed type 2 diabetes patients. 2008;58(10):557-60.
4. Shiber JR, Fontane E, Adewale A. Stroke registry: hemorrhagic vs ischemic strokes. *Am J Emerg Med*. 2010;28(3):331-3.
5. Lloyd-Jones D, Adams RJ, Brown TM, Carnethon M, Dai S, De Simone G. Heart disease and stroke statistics—2010 update A report from the American Heart Association. *Circulation*. 2010;121(7):e46-e215.
6. Zahra F, Kidwai SS, Siddiqi SA, Khan RM. Frequency of newly diagnosed Diabetes Mellitus in acute ischemic Stroke Patients. *Journal of the College of Physicians and Surgeons Pakistan*. 2012;22 (4):226-9
7. Ali S. Frequency of Risk Factors in Patients with Acute Stroke at Tertiary Care Hospital Bahawalpur. *Ann Pak Inst Med Sci*. 2013;9(1):8-11.
8. Song S, Burgess RE, Kidwell CS. Racial differences by ischemic stroke subtype: a comprehensive diagnostic approach. *Stroke research and treatment*. 2012; 2012: 1-6.
9. Jia Q, Zheng H, Zhao X, Wang C, Liu G, Wang Y. Abnormal Glucose Regulation in Patients With Acute Stroke Across China Prevalence and Baseline Patient Characteristics. *Stroke*. 2012;43(3):650-7.
10. Samiullah S, Hafiz S, Iftikhar Q, Khalid S. Frequency of metabolic syndrome and its various components in patients with ischemic stroke. *Int J Med Med Sci* 2011; 3:247-8
11. Urabe T, Watada H, Okuma Y, Tanaka R, Ueno Y, Miyamoto N, et al. Prevalence of abnormal glucose metabolism and insulin resistance among subtypes of ischemic stroke in Japanese patients. *Stroke*. 2009;40:1289–1295.
12. Marjukka H, Jaakko T, Markku M, Coen DA S, Kalevi P, Bjorn Z, et al. Hyperglycemia and incidence of ischemic and hemorrhagic stroke-comparison between fasting and 2-hour glucose criteria. *Stroke* 2009; 40: 1633-7.