ORIGINAL ARTICLE

The Frequency of Newly Diagnosed Diabetes Mellitus in Acute Ischemic Stroke Patients

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ABSTRACT

Background: Stroke is ranked as the 3rd leading cause of mortality worldwide and the leading cause of disability in the United States. A diagnosis of diabetes is considered to be an autonomous risk factor for coronary heart disease and stroke.
Objective: To find out the frequency of newly diagnosed diabetes mellitus in acute ischemic stroke patients.
Method: The current study was descriptive and cross sectional carried out at the Department of General Medicine, MTI-HMC, Peshawar for duration of six months from June, 2019 to December, 2019. In all patients the level of HbA1c levels of was determined in pathology department and their previous records were checked for any history of diabetes or anti diabetic medications. The data was analyzed by using SPSS version 19.
Results: In group 1st (40-60) there were 100 (44.05%) acute ischemic stroke patients while in group 2nd (61-80) 127 (55.94%) patients of acute ischemic stroke were recorded. The numbers of male patients were 147 (64.75%) while there were 80 (35.24%) female patients. Mean HbA1c level was observed as 6.2 ±1.44. Newly diagnosed diabetes mellitus was observed in 74 (32.59%) patients.
Conclusion: Our study shows that 32.59% acute ischemic stroke patients had newly diagnosed diabetes. Therefore, our research suggests that diabetes mellitus is a common condition in those who have had an acute ischemic stroke. It is suggested that all patients with acute ischemic stroke be diagnosed with diabetes mellitus in order to lower long-term morbidity and death.
Keywords: Acute Ischemic Stroke, Newly Diagnosed Diabetes Mellitus, HbA1c.

INTRODUCTION

Stroke is ranked as the 3rd leading cause of mortality worldwide and the leading cause of disability in the United States. A diagnosis of diabetes is considered to be an autonomous risk factor for coronary heart disease and stroke. Diabetes is the primary risk factor for having a stroke after having a transient ischemic attack (TIA) or recurrent stroke. Diabetes patients have a risk of recurrent stroke that is independent of glycemic management and is between two and five times higher than that of non-diabetic patients [1,2]. The classic glucose-based diagnostic standards are focused on fasting plasma glucose (FPG) and the oral glucose tolerance test [1]. Hemoglobin A1c (HbA1c) (HbA1c 6.5%) is a newly suggested criterion that is an alternative to those of the World Health Organization and the American Diabetes Association [3]. In patients with acute ischemic stroke, they observed that 76 (30.89%) had recently been diagnosed with diabetes mellitus [2, 4]. Hyperglycemia is often seen in hospitals in patients who have had acute ischemic strokes, and after the acute phase, it may persist for many days[5]. The glycemic index of around two thirds of stroke patients is high (i.e., >6.1 mmol/L). This demonstrates the very high frequency of post-stroke hyperglycemia (PSH) in individuals who have had an acute ischemic stroke. Another study employed the criteria of "HbA1c", "2 h OGTT", and FPG". They reported that 471 patients (37.5%) amongst 1251 ischemic stroke patients are pre-diabetes while they reported 539(43.1%) as newly diagnosed diabetic patient. On the basis of above three mentioned criteria, they reported that 118 (9.4%), 290 (23.2%) and 314 (25.1%) were prediabetes in acute ischemic stroke patients according to FPG, 2 h OGTT, and HbA1c respectively [6]. While the newly diagnosed diabetes mellitus were 138 (11.0%), 370 (29.6%), and 365 (29.2%) according to FPG; 2 h OGTT, and HbA1c respectively[7].

Since no local research has been done on the subject, the goal of this study is to determine how often acute ischemic stroke patients have recently diagnosed diabetes mellitus. This research will provide information on newly diagnosed diabetes mellitus in individuals who have had an acute ischemic stroke in our area. Additionally, this study's advantages in early detection and treatment will lower long-term morbidity and mortality. The findings will be communicated to regional health experts in the format of protocols, standards, and suggestions for improved understanding and treatment of these individuals in our community.

MATERIALS AND METHODS

The current study was descriptive and cross sectional carried out at the Department of General Medicine, MTI-HMC, Peshawar. The duration of study was six months from June, 2019 to December, 2019. Sample Size was 227 patients by keeping newly diagnosed diabetes frequency as 30.89%[2] and confidence level as 95% while margin of error was kept as 5.3% according to the WHO formula for determination of sample size. Non-probability consecutive sampling technique was used. The inclusion criteria of our study were all patients of both genders having acute ischemic stroke presented within 72 hours of onset of symptoms and age 40-80 years whereas criteria for exclusion of our study were patients presented with history of diabetes mellitus, patients using anti-diabetic medicine. Our study was conducted after approval from research ethical committee. The purpose and benefit of our study was described in detail to all the included patients and their attendants. Consent form was taken from all the included patients or their attendants. Based on the inclusion criteria, all the patients were enrolled from indoor and emergency departments. In all these patients the level of HbA1c level was determined in pathology department and their previous records was checked for any history of diabetes or anti diabetic medications. The presence of acute stroke was confirmed by the CT Brain in the radiology department. A predesigned proforma was used to record name, age, gender, blood pressure, and HbA1c level. The data was analyzed by using SPSS version 19. For variables such as age, weight, height, HbA1c Level and BMI, means and standard deviations were calculated whereas frequencies and percentages were determined for variables like newly diagnosed diabetes mellitus and gender. Stratification of newly Diagnosed Diabetes Mellitus was done with age, gender, hypertension to determine effect modifications. Chi-square test was employed and P value < 0.05 was considered as significant. All results were presented in form of graphs and tables.

RESULTS

On the basis of age, the acute ischemic stroke patients were divided into two ages groups. In first group (40-60) there were 100 (44.05%) acute ischemic stroke patients while in group second (61-80) 127 (55.94%) patients of acute ischemic stroke were recorded. The number of male patients was 147 (64.75%) while there were 80 (35.24%) female patients. Newly diagnosed diabetes mellitus was observed in 74 (32.59%) patients. (Figure 1). Stratification of newly diagnosed diabetes mellitus with age, gender, hypertension and BMI in acute ischemic stroke patients is given in Table 2. There is significant association of age with frequency on new onset Diabetes in acute ischemic stroke patients.

Table 1: Descriptive statistics N= 227

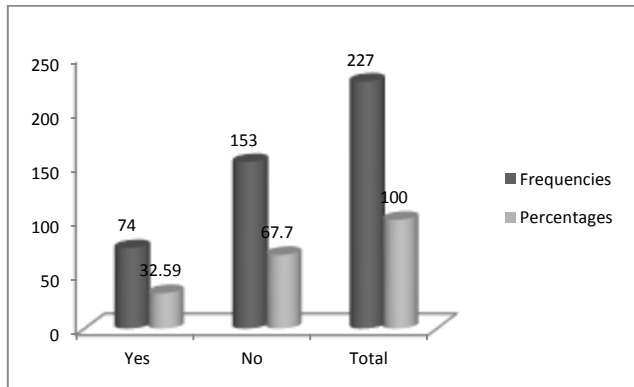| Variables	Mean
Age	62 ± 9.34 years
Height	5.8 ± 0.09 inch
Weight	86 ± 4.33 kgs
BMI	29.65 ± 1.58
HBA1c	6.2 ± 1.44

Figure 1: frequencies of newly diagnosed diabetes in acute ischemic stroke.

Table 2: Stratification of newly diagnosed diabetes mellitus with age, GENDEER, hypertension and BMI in acute ischemic stroke patients

Age	Newly Diagnosed DM	Frequencies	%	P Value
40-60 Years	Yes	20	8.81%	
	No	80	35.24%	0.0003
61-80 Years	Yes	54	23.78%	
	No	73	32.15%	
Male	Yes	52	22.90%	
	No	95	41.85%	0.226
Female	Yes	22	9.69%	
	No	58	25.55%	
Hypertension	Yes	15	6.60%	
	No	32	14.09%	0.910
Non hypertensive	Yes	59	25.99%	
	No	121	53.30%	
BMI > 30	Yes	45	19.82%	
	No	96	42.29%	0.830
BMI < 30	Yes	29	12.77%	
	No	57	25.11%	

DISCUSSION

On the basis of age, the acute ischemic stroke patients were divided into two age groups. In group 1st (40-60) there were 100 (44.05%) acute ischemic stroke patients while in group 2nd (61-80) 127 (55.94%) patients of acute ischemic stroke were recorded. The number of male patients was 147 (64.75%) while there were 80 (35.24%) female patients. This was in contrast with a previous study[8]. On the contrary hand, our findings are consistent with earlier research that found a higher frequency of stroke in male than in females [1, 9].

The average age was 62+9.34, the average weight was 86+4.33, the average height was 5.8+0.09, and the average BMI was given as 29.65+1.58. Mean HbA1c level was observed as 6.2+1.44. Newly diagnosed diabetes mellitus was observed in 74 (32.59%) patients

Although the long-term effects of stroke remain unknown[4], younger individuals are more susceptible to them than older ones. Patients who are admitted to the hospital for an acute ischemic stroke are more likely to have hyperglycemia, which might persist for several days after the acute phase5. Every third stroke patient has a glycemic index that is high (i.e. >6.1 mmol/L). This demonstrates the very high rate of post-stroke hyperglycemia (PSH) in individuals who have had an acute ischemic stroke [6]. Similar incidence was seen in a research conducted by Zahra F, et al., who found 50 (20%) of the overall 250 patients with acute ischemic stroke had diabetes mellitus [2]. Another local research of 142 individuals with acute ischemic stroke revealed a frequency of diabetes mellitus of 21.1% [10]. A previous research found that acute ischemic stroke patients in Pakistan had a higher frequency of diabetes mellitus (35.2%) [11]. In a previous research, Jia Q et al. (2012) found that 45.8% of those who had acute ischemic strokes also had diabetes mellitus [12]. Strong correlation with higher risk of acute ischemic stroke was shown in a research by Marjukka et al. [13].

CONCLUSION

Our study shows that 32.59% acute ischemic stroke patients had newly diagnosed diabetes. Therefore, our research suggests that diabetes mellitus is a common condition in those who have had an acute ischemic stroke. It is suggested that all patients with acute ischemic stroke be diagnosed with diabetes mellitus in order to lower long-term morbidity and death.

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