ORIGINAL ARTICLE

Frequency of Albuminuria in Diabetic Patients Presenting with Stroke

MASOOD UZ ZAMAN BABAR[1], SUNIL DAT MAHESHWARI[2], MUJTABA SHAH[3], GHULAM FAREED[4]
[1]Senior Registrar, Department of Neurology Isra University Hyderabad
[2,3,4]Senior Registrar, Department of Medicine Isra University Hyderabad
Correspondence to: Dr. Masood uz Zaman Babar, Email: zamanbabbar@yahoo.com, Cell No. +92333 2584012

ABSTRACT

Objective: To determine the frequency of albuminuria in patients with diabetes mellitus presented with stroke.
Study Design: Cross-sectional
Place and Duration: Study was conducted at Isra University Hospital Hyderabad for duration of one year from November 2019 to October 2020.
Methodology: One hundred and thirty two diabetic patients of either gender presented with stroke were enrolled. Patients ages were ranging from 20 to 70 years. After taking written consent, detailed demographics including age, sex, BMI, and complete blood picture were recorded. Albuminuria was examined by dipstick method. Data was analyzed by SPSS 27.0.
Results: Out of 132 patients, 86 (65.15%) were males while rest 34.85% were females. Majority 62 (46.97%) patients were ages 35 to 50 years followed by 40 (30.30%) patients had ages 50 to 65 years. Albuminuria was found in 57 (43.18%) patients. Frequency of albuminuria among females was high as compared to males (p-value <0.05).
Conclusion: It is concluded that frequency of albuminuria 43.18% among diabetic patients whom were presenting with stroke.
Keywords: Diabetic Patients, Stroke, Albuminuria

INTRODUCTION

Diabetes mellitus is a common and serious problem which emerges quickly as a global health problem which is expected to reach pandemic levels by 2030, with the largest rise in developing countries.[1] While the prevalence of type 1 and type 2 diabetes mellitus is growing globally, the prevalence of type 2 diabetes is rising substantially faster because of increased obesity and decreased levels of activity in countries becoming more industrialized[2]. Latest projections suggest that by 2025 the incidence of diabetes will rise to 7.1 percent, affecting approximately 380 million people worldwide[3].

Diabetes people are more vulnerable to a range of significant health issues including macro-vascular problems, premature death, blindness, renal failure, amputations, fractures, depression and cognitive loss[4].

Microalbuminuria is one such emerging vascular risk factor[5]. The common concept of micro albuminuria is a urinary albumin release rate or an albumin: creatinine ratio of between 30 to 299 mg/day in males and between 25 mg/mmol in males and between 3.5 and 25 mg/mmol in females[5]. While sometimes used as a signal of early kidney disease, microalbuminuria is an independent marker of endothelial dysfunction[6]. It interacts with many common vascular risk factors. In fact, it is thought that evaluating the kidney structure by means of this very simple test may be a window on the systemical vasculature, i.e. leaky renal vessels indicating vasculature permeability in general and the vulnerability of a person to organ damage[7].

Prevalence of cerebrovascular illness in diabetics is 7%, 2-3 times higher than the general population, with a chance of fatal stroke[8]. Endothelial cell dysfunction and inflammation are essential to the growth of stroke in mellitus diabetes[9]. As an endothelial dysfunction and subclinical atherosclerosis symptom of albuminuria, the existence of albuminuria is considered a major stroke indicator. Diabetic nephropathy, as albuminuria (approximately 34 percent), is normal in diabetics and thus highlights the increased risk of stroke development[10]. We conducted present study to determine the frequency of albuminuria in diabetic patients presenting with stroke.

MATERIALS AND METHODS

This cross-sectional/observational study was conducted at Isra University Hospital Hyderabad for duration of one year from November 2019 to October 2020. Total 132 diabetic patients of both genders presented with stroke were enrolled in this study. Patients ages were ranging from 20 to 70 years. After taking written consent, detailed demographics including age, sex, BMI, and complete blood picture were recorded. Patients with prior history of hypertension, smoking, valve heart disease, atrial fibrillation, chronic renal failure and cirrhosis detected during interviews, physical examinations or investigations were excluded.

Urine samples were collected and sent to laboratory for detection of albuminuria. Dipstick method was used for examination of albuminuria. Appearance of >30mg of albumin measured by 24 hour urinary protein in hospital laboratory was considered significant. All the data was analyzed by SPSS 27.0. Mean±Sd was done. Frequencies and percentages were recorded in tabulation form. Chi-square test was done to compare the frequency of albuminuria between male and females. P-value <0.05 was considered as significant.

RESULTS

Out of 132 patients, 86 (65.15%) were males while rest 34.85% were females. Majority 62 (46.97%) patients were ages 36 to 50 years followed by 40 (30.30%) patients had ages 51 to 65 years, 16 (12.12%) patients were ages 20 to 35 years and 14 (10.61%) patients had ages above 65 years. Mean BMI of patients was 26.27±2.48 kg/m^2. (Table 1)

Table no 1: Baseline details of all the included patients

Variables	Frequency No.	% age
Gender		
Male	86	65.15%
Females	46	34.85%
Age (Years)		
20 to 35	16	12.12%
36 to 50	62	46.97%
51 to 65	40	30.30%
Above 65	14	10.61%
Body Mass Index		
BMI	26.27±2.48	-

Albuminuria was found in 57 (43.18%) patients while 75 (56.82%) patients had no albuminuria. (Figure 1)

Figure No 1: Frequency of albuminuria among all the patients
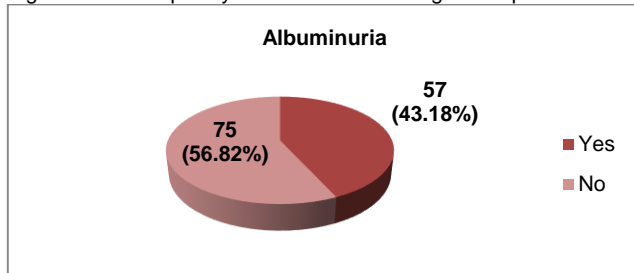
Albuminuria

When we stratified albuminuria with gender we found that frequency of albuminuria was high in females 28 (60.87%) as compared to males 29 (33.72%), the difference was statistically significant with p-value 0.028. (Table 2)

Table 2: Association of albuminuria with gender

Variables	Frequency No.	Albuminuria Yes	Albuminuria No	P-value
Gender				0.028
Male	86	29 (33.72%)	57 (66.28%)	
Females	46	28 (60.87%)	18 (39.13%)	

DISCUSSION

Diabetes mellitus is one of the most common disease found all over the world and highly associated with morbidity and mortality[11]. Several studies have shown that albuminuria is a significant risk factor for arteriosclerosis, ischaemic heart disease and other diabetic vascular diseases[12]. Diabetic nephropathy has been found to be substantially linked to diabetic retinopathy and coronary artery disease, and a few studies showed a correlation between diabetic nephropathy and neuropathy and peripheral vascular disease[13]. The present study was conducted with aimed to examine the frequency of albuminuria among diabetic patients whom were presented with stroke. In this regard 132 patients were analyzed. Majority of patients 65.15% were males while females were 34.85%. Majority 62 (46.97%) patients were ages 36 to 50 years followed by 40 (30.30%) patients had ages 51 to 65 years, 16 (12.12%) patients were ages 20 to 35 years and 14 (10.61%) patients had ages above 65 years. Previous studies demonstrated that males population was high as compared to females had diabetes mellitus whom were

developed macrovascular problems and majority 60% patients were in the age group 40 to 60 years[14-15].

In present study we found that 57 (43.18%) patients had albuminuria while 75 (56.82%) patients had no albuminuria. A study conducted by Sohail M et al[16] regarding frequency of albuminuria among diabetic patients presented with macrovascular problems, in their study 88 patients were analyzed and among them overall albuminuria was found in 92% patients and out of 13 ischemic stroke patients 12 (92.3%) patients had albuminuria.

Jadoon ZG et al[17] demonstrated that the frequency of albuminuria in diabetic patients with stroke was 35.37% out of 147 patients. Another study by Prasanth P et al[18] reported that the prevalence of albuminuria in diabetic mellitus patients was 36%.

In a multivariate analysis, a study by Yuyun and his collaborators in Britain found that Microalbuminuria was an independent indicator only of ischemic stroke (HR 2.01;95 percent of CI 1.29 to 3.31), and concluded it was correlated with an increase of approximately 50 percent of the general population's risk of Stroke independently[19].

In our study when we stratified albuminuria with gender we found that frequency of albuminuria was high in females 28 (60.87%) as compared to males 29 (33.72%), the difference was statistically significant with p-value 0.028. A study conducted in Japan reported that urinary albumin was an independent risk factor for stroke in men (RR 2.5; 95% CI 1.1 to 5.7) but not in women[20].

Many researches on the association of albuminuria with macro-vascular diabetes mellitus complications have only been reported. The effect is an independent indicator of macrovascular complications in their albuminuria. The risk for cardiovascular accidents was doubled and the standardised mortality ratio was 18.3 times higher in large-scale cohort studies[21-22].

CONCLUSION

Diabetes mellitus is one of the major risk factor predicting macrovascular complications such as stroke, myocardial infarction and cardiovascular diseases. We concluded from this study that the frequency of albuminuria in diabetic patients with stroke was 43.18%.

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