

Examine the Prevalence of Albuminuria in Diabetic Patients Presented With Stroke

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ABSTRACT

Aim: To examine the incidence of albuminuria in diabetes mellitus patients whom were presented with stroke.

Study Design: Cross-sectional/observational

Place and duration of study: Department of Neurology, Chandka Medical College Hospital, Larkana from 1st April 2020 to 30th September 2020.

Methods: One hundred and twenty diabetic patients having ages 20 to 70 years presented with stroke were enrolled in this study. Patient's detailed demographics including age, gender, residence and socio-economic status were recorded after written consent. Types of stroke were examined. Urine collection was done to examine the prevalence of albuminuria.

Results: There were 79 (65.83%) male and 41 (34.17%) females. Majority of patients 82 (68.33%) were ages >40 years. Ischemic was the most common type of stroke found in 94 (78.33%) patients followed by hemorrhagic in 16 (13.33%) and undetermined in 10 (8.33%) patients respectively. Albuminuria was found in 46 (38.33%) patients. From 46 albuminuric patients 34 (73.91%) had ischemic stroke, 7 (15.22%) had hemorrhagic and 5 (10.87%) had undetermined stroke.

Conclusion: Incidence of albuminuria was not low in diabetes mellitus patients presented with stroke. Ischemic stroke was the commonest type of stroke.

Keywords: Diabetes mellitus, Albuminuria, Ischemic stroke, Hemorrhagic, Undetermined

INTRODUCTION

World Health Organization (WHO) defines stroke as rapidly developing clinical signs due to focal disruption in cerebral function, which last for more than twenty four hours or which can cause death without any apparent reason other than vascular origin.¹ Stroke or cerebrovascular disease accounts for the largest no of death and disabilities worldwide.² The lack of awareness programs, regarding prevention and early medical management is also improper. This leads to an increase in prevalence and incidence of stroke, thus increasing the economic burden. All this can be prevented by assessing well defined modifiable risk factors and take preventive measures.³

Cerebrovascular stroke is classified into ischemic stroke and hemorrhagic stroke. Of these, the incidence of ischemic stroke is a consequence of obstruction of blood vessels by a thrombus or embolus.⁴ These are peripheral vascular complications of hypertension. The risk factors of hypertension leading to Ischemic stroke which can be modified are smoking, high fat diet, sedentary life style, obesity and inflammation.⁵ The biomarkers of inflammation include C-reactive protein (CRP), lipoprotein associated phospholipase A2, increased leucocyte count, pro inflammatory interleukins, endothelial nitric oxide, lipoprotein (a), homocysteine, tissue factors, intracellular adhesion molecules, plasma fibrinogen as risk factors for cerebrovascular ischaemic stroke⁶. A new risk factor in the group is microalbuminuria.⁷

Microalbuminuria is defined as urinary albumin excretion in a day (24 hours) and the normal biological reference is 30-300 µg/24 hrs. This can also be assessed by measuring the urinary albumin creatinine ratio (ACR) in the morning first sample and the normal biological reference range is 30-300 mg/g.⁸ The National nutrition examination survey conducted by United States suggested that microalbuminuria is most common in HTN and Diabetic patients but also found in 5% healthy volunteers.⁹ Microalbuminuria is a marker for vascular endothelial dysfunction.¹⁰ Recent studies have suggested that, microalbuminuria may have a role in vascular endothelial damage, renal dysfunction and inflammation. Recent research have observed that, microalbumin is an independent risk factor for haemorrhagic cerebrovascular stroke and is positively correlated with Carotid artery intimal thickness.¹¹ The present study was conducted to examine the prevalence of microalbuminuria in diabetic patients present with stroke.

MATERIALS AND METHODS

This prospective/observational study was conducted at Department of Neurology, Chandka Medical College Hospital, Larkana from 1st April 2020 to 30th September 2020. A total of 120 diabetic patients having ages 20 to 70 years presented with stroke were enrolled. Patient's detailed demographics including age, genders, residence and socio-economic status were recorded after written consent. Non-diabetic patients, patients with history of ischemic stroke, patients with renal failure and those with no consent were excluded from study. Complete physical

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examination was performed. Laboratory tests such as FBS, LFTs, renal profile, ultrasound abdomen and ECG was performed in all patients. Urine samples were collected in the graduated jar and sent to laboratory after 24 hours to examine the albuminuria. A ratio of albumin (mcg/L) to creatinine (mg/L) of less than 30 is normal; a ratio of 30-300 signifies microalbuminuria and values above 300 are considered as macroalbuminuria. Data was analyzed by SPSS 24.

RESULTS

Seventy nine (65.83%) were male and 41(34.17%) were females. Thirty eight (31.67%) patients were ages <40 years and 82(68.33%) were ages >40 years. Seventy five (62.5%) patients had urban residency while 45(37.5%) patients had rural residence. 46(38.33%) patients had low socio-economic status, 54(45%) had middle and 20(16.67%) had high socio-economic status. Ischemic was the most common type of stroke found in 94(78.33%) patients followed by hemorrhagic in 16(13.33%) and undetermined in 10(8.33%) patients respectively (Table 1).

Table 1: Demographical details of all the patients

Variable	No.	%
Gender		
Male	79	65.83
Female	41	34.17
Age (years)		
≤40	38	31.67
>40	82	68.33
Residence		
Urban	75	62.5
Rural	45	37.5
Socioeconomic status		
Low	46	38.33
Middle	54	45.0
High	20	16.67
Stroke Types		
Ischemic	94	78.33
Hemorrhagic	16	13.33
Undetermined	10	8.33

Fig. 1: Prevalence of albuminuria in all the patients

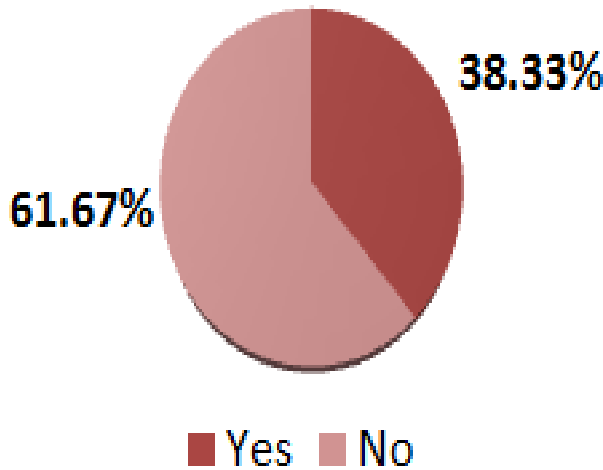


Table 2: Frequency of albuminuria according to the types of stroke

Types	Albuminuria Yes (n=46)	Albuminuria No (n=74)	Total (n=120)
Ischemic Stroke	34 (73.91%)	60 (81.08%)	94 (78.33%)
Hemorrhagic	7 (15.22%)	9 (12%)	16 (13.33%)
undetermined	5 (10.87%)	5 (6.76%)	10 (8.33%)

Albuminuria was found in 46 (38.33%) patients while 74 (61.67%) patient had not found albuminuria (Fig. 1). From 46 albuminuric patients 34 (73.91%) had ischemic stroke, 7 (15.22%) had hemorrhagic and 5(10.87%) had undetermined stroke (Table 2).

DISCUSSION

Stroke is one of the leading causes of severe complications and mortality in all over the world. Diabetes mellitus, hypertension and cardiovascular diseases are the most important risk factors for stroke occurrence.^{12,13} Albuminuria is considered a strong predictor of diabetic patients presented with stroke. Albuminuric diabetic patients had high rate of morbidity and mortality than the non-albuminuric patients.¹⁴ In this study we examined the prevalence/incidence of albuminuria in diabetic patients presented with stroke. In our study majority 65.83% patients were male while 34.17% patients were females and majority of patients had ages above 40 years 68.33%. These results showed similarity to many of previous studies conducted regarding stroke and reported that male patient's population was high 60% to 75% as compared to females and mostly patients were ages above 50 years.^{15,16}

In the present study ischemic was the most common type of stroke found in 94 (78.33%) patients followed by hemorrhagic in 16(13.33%) and undetermined in 10(8.33%) patients. A study conducted by Aguilar et al¹⁷ reported that ischemic was the commonest type of stroke in 81% followed by hemorrhagic 12% and unclassified 7%.

In the current study, the incidence of albuminuria was 38.33% in diabetes mellitus patients presented with stroke. A study conducted by Jadoon et al¹⁸ reported that the frequency of albuminuria in diabetic patients was 35.37% among 147 patients. Another study conducted by Prashanth et al¹⁹ reported that the albuminuria was found in 36% among 447 diabetic patients presented with stroke. Many of other studies showed similarity to our study findings regarding frequency of albuminuria and demonstrated that albuminuria rate was quite high in diabetic patients whom were presented with stroke ranges 32% to 55% respectively.²⁰⁻²²

In this study, 46 albuminuric patients, 34 (73.91%) had ischemic stroke, 7 (15.22%) had hemorrhagic and 5 (10.87%) had undetermined stroke. These results were comparable to some other studies.^{23,24}

CONCLUSION

Ischemic, hemorrhagic strokes are the leading cause of morbidity and mortality. Diabetes mellitus is one of the important causes of developing stroke. We concluded that that incidence of albuminuria was not low in diabetes mellitus patients presented with stroke. Ischemic stroke was the commonest type of stroke.

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