Microalbuminuria in Nondiabetic Acute Ischaemic Stroke

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Abstract

Background: Microalbuminuria has been associated with clinical risk factors for stroke like diabetes, hypertension, aging, history of myocardial infarction, obesity, smoking and left ventricular hypertrophy. The present study is aimed to determine the potential use of microalbuminurea, as a marker of stroke risk and its outcome in non-diabetic population.

Methods: The present study was conducted in the department of general medicine. A total of 30 patients admitted with acute ischemic stroke presenting within 24 hours of stroke onset were recruited for the study. The microalbuminurea was assayed by immunoprecipitation. The stroke severity was assessed by NIH Stroke Severity Statistical Software Package. P value less than 0.05 was considered the level of significance.

Results: There was graded co-relation between NIHSSS score and urine albumin excretion with significant P value of <0.001 in case group.

Conclusion: Urine albumin excretion had the strongest correlation with the NIHSSS Score of the patient in acute ischemic stroke. Therefore, measurement of microalbuminurea may help to assess those who are at increased risk and to triage those who may need a more aggressive management protocol.

Keywords: Microalbuminurea, Acute ischemic stroke, NIHSSS score

Introduction

"Cerebrovascular Disease" or "Stroke" is one of the leading causes of mortality and morbidity in adults worldwide, posing serious medical, socioeconomic and rehabilitation problems. Stroke also called 'Brain Attack' because it involves an acute insult to the brain, is a major disabling disease. But throughout the world, unfavourable trends in stroke risk factor profile, lack of prevention programs, lack of awareness of stroke risk factors and warning signals by the public and lack of emphasis on preventive training in medical schools, portend high stroke rates and serve to widen the stroke prevention gap.[1] This is unfortunate because stroke is well suited for prevention since it has high prevalence, high burden of illness and economic cost, well defined modifiable risk factors and effective prevention measures.[2]

Microalbuminuria has been associated with many disease entities like diabetic nephropathy, hypertension with left ventricular hypertrophy and renal insufficiency, etc. Microalbuminuria has been associated with clinical risk

factors for stroke like diabetes, hypertension, aging, history of myocardial infarction, obesity, smoking and left ventricular hypertrophy. But, there was little information regarding micro-albuminuria as an independent risk factor for stroke or as a predictor of stroke outcome. With the availability of sensitive and relatively inexpensive methods for detection of microalbuminurea, many studies has been conducted in different parts of the world to determine the potential use of microalbuminurea, as a marker of stroke risk and its outcome in non-diabetic population. Such reports are lacking from our country, hence an attempt has been made to study microalbuminurea in non-diabetic acute ischemic stroke patients.[3]

Materials and Methods

The proposed study is conducted in the Department of Medicine, S.R.G. Hospital, Jhalawar.

Inclusion criteria

- It include patients diagnosed with ischemic stroke irrespective of age and sex confirmed by CT scan brain, within 24 hours after the onset of symptoms.
- The severity of neurological deficit will be measured by the Scandinavian Stroke Scale (SSS)
- The albumin excretion rate will be measured using spot urine collection by Micral Test.

Exclusion criteria

- Patients with hemorrhagic stroke.
- Patients with diabetes, defined as fasting plasma glucose > 126 mg/dl or 2-hour plasma glucose > 200 mg/dl during an oral glucose tolerance test or use of antidiabetic drugs.
- Patients with hypertension, defined as systolic blood pressure > 140 mmHg or diastolic blood pressure > 90 mmHg or the use of anti-hypertensive medication.
- Systemic infection including bacterial meningitis.

- Nephropathy and abnormal urinalysis.
- Major trauma and surgery.

Detailed history, clinical examination and relevant laboratory investigation were done as per the proforma.

The severity of stroke was assessed using Scandinavian Stroke Scale.

Statistical Analysis - The data was collected and entered in Microsoft excel. The graphs and tables were generated using Microsoft Word and Excel. The analysis of the data was done using the statistical Software namely SPSS 22.00.

Results

Table 1: Baseline characteristics

Variable	Case (n=30)	Control (n=30)
Age (Mean±SD)	63.02±12.14	57.84±10.24
Male : Female	22:8	21:9
NIHSSS score	16.20 ± 5.24	9.54 ± 2.02
Urine albumin excretion	78.20± 31.10 mg/g	16.90± 5.60 mg/g

The numbers of stroke patients with microalbuminurea are 43.33% and 56.67% stroke patients were without microalbuminurea. Mean age of patients in group A was 63.02 ± 12.41 years and mean age of patients in group was 57.84 ± 10.24 years. The difference between two groups was found to be statistically significant with P value <0.05. Among study sample 73.33% were males and 26.67% were females. Among males 70% were microalbuminurics and among females 30% were microalbuminurics.

Table 2: NIHSSS in relation to microalbuminurea in both the groups

NIHSSS	Case			Control		
	No of cases	Urine albumin excretion	p-value	No of cases	Urine albumin excretion	p-value
<7	1	28.20± 0.00	0.001	06	11.40 ± 8.02	>0.05
7-15	16	32.90±10.78		22	25.45 ± 9.70	
>15	13	93.26 ± 12.02		02	78.20 ± 1.20	

Based on NIH SSS Score cases were categorized into 3 levels. Those with score<7 level 1 (mild neuro-deficit), 7-15 into level 2 (moderate neuro-deficit) and>15 into level 3 (severe neurodeficit). In case, 3.33% were in level 1 with mean urine albumin excretion 28.20 ± 0.0, 53.33% were in level 2 with mean urine albumin excretion 32.90 ± 10.78 and 43.33% were in level 3 with mean urine albumin excretion 93.26 ± 12.02, there was graded co-relation between NIHSSS score and urine albumin exceration with significant P value of <0.001in case and but no such co-relation was seen in control.

Discussion

This study was a prospective, observational and comparative study of the levels of albumin in urine of acute ischaemic stroke patients and its correlation with severity of stroke per NIH SS. A total of 60 patients were enrolled which were divided into two groups.

In this study albumin levels were done in 24 hour urine collection of all 60 patients and the level of urinary albumin was compared with stroke severity per NIHSS.

Microalbuminuria signifies abnormal vascular permeability and its presence may be considered as kidney's notice for markedly enhanced cerebrovascular risk. [4] The importance of microalbuminurea was first appreciated in the early 1980s when two landmark studies in London and Denmark independently reported that it was predictive of development of overt diabetic nephropathy and progressive renal failure. [5,6]

The mean age in the study was 63.02 years in cases and 57.84 years in controls. This parameter is closely related to study by Vaidya CV et al with a mean age 61 years and Awad SM et al with a mean age of 63.6 years. [4,5]

The association of microalbuminuria in cerebrovascular diseases has been confirmed in a few western studies. this study was undertaken to analyze 'Microalbuminuria in acute cerebral ischemic events' in our context. After analysis of 100 patients with reference to inclusion and exclusion criteria, 30 patients were selected for the study. In the present study, microalbuminuria was present in 13 of 30 subjects, which amounted to prevalence of 43.33%. This was similar to the past studies in acute cerebrovascular accidents, conducted by Wojciech Turaj, [7] where 52 patients with 37 subjects in control group where the prevalence was 46% with P value <0.05.

Conclusion

Urine albumin excretion had the strongest correlation with the NIHSSS Score of the patient in Acute ischemic stroke.

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