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A STUDY ON "CORRELATION BETWEEN MICROALBUMINURIA AND ACUTE ISCHAEMIC STROKE IN NON-DIABETIC PATIENTS AND ITS PROGNOSTIC SIGNIFICANCE IN STROKE PATIENTS"

KEYWORDS

Scandinavian Stroke scale (SSS),Microalbuminuria(MA),cerebrovascular accident (CVA)

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ABSTRACT

BACKGROUND: *Cerebrovascular Disease" or "Stroke" is one of the leading causes of mortality and morbidity in adults worldwide. Microalbuminuriahas been associated with clinical risk factors for stroke like diabetes, hypertension, aging,history of myocardial infarction, obesity, smoking and left ventricular hypertrophy.*

AIMS AND OBJECTIVES: *To estimate the presence of microalbuminuria in non diabetic recent ischemic stroke patients and to evaluate the prognostic significance of microalbuminuria in these non-diabetic recent ischaemic stroke patients.*

METHODOLOGY: *100 patients and 100 controls with clinical diagnosis of acute ischaemic stroke confirmed by CT Scan brain were enrolled in the study. The albumin excretion rate was assessed using Micral test on early morning urine sample and expressed as -mg/L.*

RESULTS : *In patients with recent ischemic stroke, 47 pts (47%) had microalbuminuria while among controls only 10 patients (10%) had microalbuminuria. Hence patients with recent ischemic stroke were 4.7 times more likely to have microalbuminuria with p=0.027 which is significant.*

CONCLUSION : *In the present study, measurement of microalbuminuria was also found to be reliable predictor of stroke outcome 6 weeks after stroke.*

INTRODUCTION

"Cerebrovascular Disease" or "Stroke" is one of the leading causes of mortality and morbidity in adults worldwide, posing serious medical, socio-economic and rehabilitation problems[1]. The realization that atherosclerosis is an inflammatory disease[2] has led to a search for new stroke risk factors and treatment.

Microalbuminuria or dipstick negative albuminuria is conventionally defined as urinary albumin excretion between 30-300 mg/24 hour for timed 24 hours urine collections and between 20-200 mg/L for untimed samples.[3] "Microalbuminuria signifies abnormal vascular permeability and its presence may be considered as kidney's notice for markedly enhanced cerebrovascular risk."[4]

Microalbuminuriahas 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 microalbuminuria as an independent risk factor for stroke or as a predictor of stroke outcome.

AIMS AND OBJECTIVES

- To estimate the presence of microalbuminuria in non-diabetic recent ischemic stroke patients and to evaluate the prognostic significance of microalbuminuria in these non-diabetic recent ischaemic stroke patients.

METHODOLOGY

Source of data

In this clinical and investigation based study, patients with history and clinical features suggestive of recent ischemic stroke admitted into Osmania General Hospital,Hyderabad over a period of 2 years.

Method of Collection of Data

- Prospective observational study.
- 100 patients with clinical diagnosis of acute ischaemic stroke confirmed by CT Scan brain were enrolled in the study.
- 100 controls with old ischaemic stroke history within 1 year of stroke onset with similar demographic characteristics were enrolled in the study.

Inclusion criteria

a. Patients of age>18 years and both sexes with first time ischemic stroke within 24 hours of onset of symptoms, the diagnosis of stroke being established by WHO definition of stroke.

b. Ischemic lesion confirmed by CT Scan brain.

c. Hypertensive patients whether taking treatment or not are included

d. Informed consent obtained from all the patients.

Exclusion criteria

a) Patients with hemorrhagic stroke.

b) 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

c) Systemic infection including bacterial meningitis.

d) Renal insufficiency of any cause and abnormal urinalysis.

e) Major trauma and surgery.

f) Alcoholics and smokers.

- Detailed history, clinical examination and relevant laboratory investigations were done as per the proforma.
- The severity of stroke was assessed using Scandinavian Stroke Scale.

In the selected patients, the following investigations were done.

1. CT scan brain (plain) to establish the ischemic lesion.
2. Urinalysis, to exclude hematuria, leucocyturia, glucosuria and proteinuria.
3. Serum glucose levels, blood urea, serum creatinine and fasting lipid profile were estimated.
4. ECG and echocardiogram were done to assess the cardiac status.
5. The albumin excretion rate was assessed using Micral test on early morning urine sample andexpressed as ---- mg/L.

Micral Test

After discharge from the hospital, patients were re-examined 6 weeks later to measure

the stroke outcome including mortality from any cause and the capacity to perform the activities of daily living (ADL) using Barthel Index.

- 100 age and sex matched controls were selected among patients with old (6-12 months)stroke who were coming for follow up.
- The controls were screened for stroke risk factors and assessed for urinary albumin excretion rate using Micral test, fasting

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serum glucose, WBC count, total cholesterol, LDL, HDL and triglycerides.

RESULTS

Table 1:Age distribution

Age in years	No. of Cases (Percentage)	No. of Controls (Percentage)
< 20	5 (5%)	6 (6%)
21-30	8 (8%)	10 (10%)
31-40	15 (15%)	16 (16%)
41-50	20 (20%)	19 (19%)
51-60	32 (32%)	27 (27%)
61-70	15 (15%)	16 (16%)
> 70	5 (5%)	6 (6%)
Total	100	100
Mean + SD	47.67 + 15.9	47.67 + 15.9

Table 2 : Sex Distribution

	Cases		Controls	
	No. of Pts	Percentage	No. of patents	Percentage
Male	70	70%	64	64%
Female	30	30%	36	36%

Table 3 :Duration of Symptoms in cases

Duration	Cases	
Hours	No. of patients	Percentage
< 10	24	24%
10 – 20	46	46%
> 20	30	30%

Table 4 :Incidence of Microalbuminuria among study population

MA	No. of Cases	No. of Controls
Present	47%	10%
Absent	53%	90%

Inference: patients with new strokes are 4.7 times more likely to have MA with P = 0.027.

Table 5 :Association of presenting features with MA

	MA	P Value	
	Present	Absent	
LOC	24 (51.1%)	10 (18.86%)	
Aphasia	36 (76.6%)	13 (24.5%)	0.001
Seizures	10 (21.3%)	3 (5.7%)	0.02
ECG / Echo abnormalities	24 (51.1%)	11 (20.8%)	0.002

Table 6 :Mean Pattern of Parameters in study population

Parameters	Cases	Controls
SBP	162.62 + 16.6	132.98 + 5.08
DBP	93.05 + 5.53	87.7 + 1.6
RBS	77.33 + 5.59	76.67
Bl. Urea	28.04 + 4.20	27.48
Sr. Creatinine	0.71 +0.12	0.67

Table 7:Meanpattern of lipid parameters in study population

Parameters	Cases	Controls
TC	120.82 +6.2	98.69 +9.6
HDL	46.14+ 3.89	36.93+5.8
LDL	68.97 +4.18	46.75 + 7.70
TG	124.81 +2.13	92.95 + 8.98

Table 8 :CT Scan Results

	No of patients	Percentage
Right ACA Infarct	14	14%
Left ACA Infarct	8	8%
Right MCA Infarct	32	32%
Left MCA Infarct	20	20%
Right PCA	8	8%
Left PCA	10	10%
Combined lesions	8	8%
Total	100	100

Table 9:Mean pattern of Scandinavian Stroke scale SSS in present of MA

SSS	MA	Total (100)	
	Present	Absent	
Range	8-20	10-44	8-44
Mean + SD	15.57 + 4.50	26.17 + 8.22	
Inference Value	P=0.001		

SSS is significantly low in patients with MA with P= 0.001.
The severity of stroke was assessed by SSS and was found to be significantly lower in presence of MA (range 8 – 20 with mean of 15.57 + 4.5) than without MA (10-44 with mean of 26.17 + 8.22).

Table 10 :Mean pattern of Barthel's index in the presence of MA

	MA	Total (100)	
	+ nt	- Nt	
Range	50 – 70	45 -100	45-100
Mean + SD	54.70 + 4.07	73.02+14.91	
Inference Value	BI is significantly decreased in the presence of MA with P=0.0001		

Assessment of activity of daily living by Barthel index after 6 weeks showed that it was lower in patients with MA (range50-70with mean 54.70+_4.07) than without MA (range 45-100 mean 73.02+_14.91) which is statistically significant.

DISCUSSION

The present study is a comparative study consisting of 100 recent ischemic stroke patients as cases and 100 old stroke patients as controls undertaken to investigate:
1) The incidence of microalbuminuria in recent ischemic stroke patients.
2) The difference in laboratory parameters in patients with and without microalbuminuria.
3) The correlation between Scandinavian Stroke Scale and Barthel Index and presence of microalbuminuria.

Incidence of microalbuminuria MA in cases	MA in controls
Turaj et al	46.1%	13.5%
Beamer et al	29%	10%
Slowik A et al	46.7%	16.7%
Present study	47%	10%

Our study found that among age and sex matched cases and controls with similar predisposing factors, patients with new stroke were 4.7 times more likely to have microalbuminuria reaching statistically significant level(p=0.027). The finding was similar to that of other studies including Turajet al[5], Beamer et al[6] and Slowik A et al.[7]

Gender and Microalbuminuria		
Turaj et al		
	With MA	Without MA
Males	12 (50%)	14 (50%)
Females	12 (50%)	14 (50%)
Present study		
Males	28 (40%)	42 (60%)
Females	19 (63.30%)	11 (36.70%)

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The study revealed slight female preponderance between patients with microalbuminuria than those without microalbuminuria. The above study by Turaj et al [5]showed that no gender difference exists.

Loss of consciousness and microalbuminuria		
	With MA	**Without MA**
Turaj et al	35.5%	14.3%
Present study	51.1%	18.46%

Our study found correlation between diminished consciousness between patients with and without microalbuminuria. The study by Turajet al[5] also hadsimilar findings. Hence, presence of microalbuminuria was found to correlate with the severity of stroke.

ISCHAEMIC HEART DISEASE AND MICROALBUMINURIA

	WITH MA	**WITHOUT MA**
Turaj et al	9(37.5%)	15(53.6%)
Present study	24(51.1%)	11(20.8%)

Turaj et al did not find any difference. The present study showed incidence of ischaemic heart disease is significantly higher in patients with microalbuminuria apart from cerebrovascular disease.

CONCLUSION

Various clinical studies have documented microalbuminuria as a risk factor for ischemic stroke. The present study found microalbuminuria in 47% of non-diabetic recent ischemic stroke patients and is consistent with previous studies associating Microalbuminuria with atherosclerotic vascular disease.

In the present study, measurement of microalbuminuria was also found to be reliable predictor of stroke outcome 6 weeks after stroke. Whether the correlation is related to more advanced age of patients with microalbuminuria and to the worse neurological deficit during the course of the disease or microalbuminuria is an independent prognostic indicator of poor outcome in stroke patients remains to be established.

REFERENCES

1. Goldstein L. Evidence - based medicine and stroke Neuroepidemiology 1999; 18; 120-124.
2. Ross R. Atherosclerosis: an inflammatory disease. N Engl J Med 1999; 340: 115-126
3. Andrew Hartland and Peter Gostling.Microalbuminuria: Yet another cardiovascular risk factor? Ann ClinBiochem 1999; 36: 700-703.
4. American Diabetes Association, Nephropathy in Diabetes (Position statement) Diabetes Care 2004; 27 (1): 79-83.
5. Yuyun MF et al. Microalbuminuria and stroke in a British population: the European Prospective Investigation into cancer in Norfolk (EPIC-Norfolk) population study. J Intern Med 2004; 255(2): 247-256.
7. John S. Yudkin et al. Microalbuminuria as predictor of vascular disease in non-diabetic subjects. Lancet 1988; 530-533
8. Wachtell K et al. Albuminuria and cardiovascular risk in hypertensive patients with left ventricular hypertrophy. The LIFE STUDY. Ann Intern Med 2003; 139: 901-906