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Original Research

Assessment of prevalence of Microalbuminuria in essential hypertension patients: A case control study

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ABSTRACT:

Background: Microalbuminuria is defined as abnormally elevated urinary albumin excretion below the level of clinical albuminuria (albustix). Hence; the present study was conducted for assessing the prevalence of Microalbuminuria in essential hypertension patients. **Materials & methods:** A total of 50 patients with presence of essential hypertension were enrolled. Completed demographic and clinical details of all the patients were obtained. Patients attending medical OPD and ward were studied. Microalbuminuria was measured in all patients in a 24h urinary sample. Echocardiography was done in all patients. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi-square test was used for analyzing the level of significance. **Results:** MAU was found to be present in 21 patients. Hence; the overall prevalence of MAU was 42 percent. Among the patients with stage I hypertension, MAU was present in 5 patients while it was absent in 13 patients. Among the patients with stage II hypertension, MAU was present in 16 patients while it was absent in 16 patients. While analyzing statistically, it was seen that MAU was higher among patients with stage II hypertension. **Conclusion:** the presence of Microalbuminuria in a significant number of newly detected and untreated patients of essential hypertension.

Key words: Microalbuminuria, Hypertension.

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INTRODUCTION

The term microalbuminuria indicates amounts of urinary albumin excretion (UAE) greater than the 95% confidence interval of the normal population but less than amounts detectable by semiquantitative methods (30 to 300 mg/24 h or 20 to 200 µg/ min). In patients with insulin-dependent diabetes mellitus (IDDM), microalbuminuria indicates that phase of diabetic nephropathy characterized by no evidence of overt proteinuria and renal insufficiency but increased UAE and glomerular filtration rate. In patients with IDDM, several studies have indicated that microalbuminuria is a marker of glomerular damage that strongly predicts the development of overt proteinuria and progressive renal failure.[1-3]

Microalbuminuria is defined as abnormally elevated urinary albumin excretion below the level of clinical albuminuria (albustix). This represents a urinary albumin excretion rate of 20-200 micrograms/min, equal to 30-300 mg/24 h. Urinary albumin excretion can vary as much as 40% with natural fluctuations, and so several tests should be done. Inexpensive radioimmunoassay, enzyme-linked immunosorbent assays or immunoturbidimetric assays are now routine in many clinical laboratories.[4-6] Hence; the present study was conducted for assessing the prevalence of Microalbuminuria in essential hypertension patients.

MATERIALS & METHODS

The present study was conducted for assessing the prevalence of Microalbuminuria in essential hypertension patients. A total of 50 patients with presence of essential hypertension were enrolled. Completed demographic and clinical details of all the patients were obtained. Patients attending medical OPD and ward were studied. Microalbuminuria was measured in all patients in a 24h urinary sample. Echocardiography was done in all patients. Exclusion criteria for the present study included:

- Patients with presence of any other systemic illness,
- Patients with any known drug allergy,
- Patients with presence of any metabolic disorder

All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi-square test was used for analyzing the level of significance.

RESULTS

In the present study, mean age of the patients was 53.8 years. Out of 50 patients, 32 were males and 18 were females. Mean height, weight and BMI of the patients was 1.71 m, 65.11 Kg and 23.12 Kg/m^2 respectively. 36 percent of the patients had stage I hypertension while 64 percent of the patients had Stage II hypertension. Mean urea levels, creatinine levels and uric acid levels were found to be 22.15 mg/dL, 0.81 mg/dL and 7.95 mg/dL respectively. MAU was found to be present in 21 patients. Hence; the overall prevalence of MAU was 42 percent. Among the patients with stage I hypertension, MAU was present in 5 patients while it was absent in 13 patients. Among the patients with stage II hypertension, MAU was present in 16 patients while it was absent in 16 patients. While analyzing statistically, it was seen that MAU was higher among patients with stage II hypertension.

Table 1: Anthropometric variables

Variable	Mean	SD
Height (m)	1.71	0.52
Weight (Kg)	65.11	12.63
BMI (Kg/m^2)	23.12	3.55

Table 2: Stage of hypertension

Stage of hypertension	Number of patients	Percentage
Stage I	18	36
Stage II	32	64
Total	50	100

Table 3: Renal profile

Parameter	Mean	SD
Urea levels (mg/dL)	22.15	4.12
Creatinine (mg/dL)	0.81	0.35
Uric acid (mg/dL)	7.95	2.12

Table 4: Prevalence of MAU

Parameter	MAU
Number of patients	21
Percentage	42

Table 5: Correlation of occurrence of MAU and stages of hypertension

Stages of hypertension	MAU present	MAU absent
Stage I	5	13
Stage II	16	16
Total	21	29
p- value	0.00 (Significant)	

DISCUSSION

Hypertension is the growing issues of public health problem of adult population in both developed as well as developing world, affecting single person in every four people. The exact cause for hypertension is difficult to predict because hypertension results from a complex interaction of genes and environmental factors. Microalbuminuria (MAU) in essential hypertension is associated with the increased mortality. Microalbuminuria is the independent risk factor to develop cardiovascular and cerebrovascular diseases. Furthermore, MAU has been described as an early sign of kidney damage and a redactor for end stage renal disease (ESRD) and cardiovascular disease. Measurement of MAU can be done by using random spot urine sample. Due to the variation in urinary flow rate and concentration, the excreted urinary albumin can be adjusted to creatininuria.[6- 9] Hence; the present study was conducted for assessing prevalence of Microalbuminuria in essential hypertension patients.

In the present study, mean age of the patients was 53.8 years. Out of 50 patients, 32 were males and 18 were females. Mean height, weight and BMI of the patients were 1.71 m, 65.11 Kg and 23.12 Kg/m^2 respectively. 36 percent of the patients had stage I

hypertension while 64 percent of the patients had Stage II hypertension. In a previous study conducted by Rayner et al, authors tried to establish the prevalence of left ventricular hypertrophy by ECG criteria, and micro- and macroalbuminuria in mild, moderate and severe hypertensive groups. One thousand and ninety-one patients were available for analysis. The overall prevalence of micro- and macroalbuminuria in the weighted sample was 21.3 and 4.1%, respectively. In the diabetics the prevalence of microalbuminuria was 32.3% and macroalbuminuria 10.4%, respectively.[10]

In the present study, mean urea levels, creatinine levels and uric acid levels were found to be 22.15 mg/dL, 0.81 mg/dL and 7.95 mg/dL respectively. MAU was found to be present in 21 patients. Hence; the overall prevalence of MAU was 42 percent. Salles et al, in another study, assessed relationships of LVH with C-reactive protein (CRP) levels and with microalbuminuria in 705 patients with resistant hypertension. After full adjustment, both abnormal microalbuminuria (odds ratio: 1.97; 95% CI: 1.04 to 3.73) and high CRP (OR: 1.76; 95% CI: 1.06 to 2.93) were independently associated with LVH occurrence. The high-normal albuminuria was associated with a borderline significant 46% increased chance of having LVH.[11]

In the present study, among the patients with stage I hypertension, MAU was present in 5 patients while it was absent in 13 patients. Among the patients with stage II hypertension, MAU was present in 16 patients while it was absent in 16 patients. While analyzing statistically, it was seen that MAU was higher among patients with stage II hypertension. Bohm et al, in another study, assessed the frequency with which microalbuminuria (MAU) occurred in a large outpatient population who were currently treated or newly diagnosed with hypertension and to establish a correlation between MAU and known cardiovascular risk factors. A total of 21050 patients from 26 countries were included in the primary analysis. Overall, their study demonstrated a very high worldwide prevalence (58.4%) of MAU in high-risk cardiovascular patients, but with a considerable variation across countries. MAU was more prevalent in patients with coronary artery disease than in that without.[12]

CONCLUSION

The present study demonstrated the presence of Microalbuminuria in a significant number of newly detected and untreated patients of essential hypertension. Hence; screening for urine albumin excretion should be extensively adopted in clinical care.

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