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# ROLE OF MICROALBUMINURIA IN HYPERTENSION – AN OBSERVATIONAL STUDY

General Medicine

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## ABSTRACT

**Aim:** To assess the microalbuminuria prevalence among the purely hypertensive patients and to assess its impact and provide information on the relationship between microalbuminuria and target organ damage.

**Material and Method:** The study was conducted for a period of three months. A predetermined proforma was used to record the details of history, physical examination and investigations. Microalbuminuria was assessed by urine Micral Strip test (Quick, early and reliable detection of albumin in urine). 200 patients were eligible based on the inclusion criteria. Data was collected and analysed by SPSS 14 software.

**Inclusion criteria:** 1) Age: 20 to 79 years 2) Patients who were under the treatment for hypertension 3) Newly diagnosed hypertensives, with systolic blood pressure >140 mm of Hg and Diastolic blood pressure > 90 mm Hg.

**Exclusion criteria:** 1) History of Diabetes Mellitus 2) History of overt proteinuria 3) Known case of CAD, congestive cardiac failure 4) Past h/o of Known case of renal failure 5) Any history of urinary tract infections or Pyelonephritis leading to renal dysfunction 6) Any history of Neoplasm 9) Age less than 20 years and more than 80 years 10) Pregnant women were also excluded from the study.

**Results:** Out of 200 patients, 138 were males and 62 were females. Microalbuminuria was observed in 23% of patients developed, out of which 16% of Male were affected and 7% of females were affected. Presence of microalbuminuria in different age groups was presented and Tabulated. It was noted that people with age group more than 40 years have slightly highest tendency to develop microalbuminuria due to multiple factors. In people with more than 10 years of Hypertension there were 18 patients who developed Microalbuminuria which constituted nearly 75% of total affected patient, whereas in new onset of Hypertensive patients the proportion of patient had Microalbuminuria is 27.27%.

**Conclusion:** Microalbuminuria incidence and prevalence increases with the advancement of age of patients, along with the duration and severity of hypertension also plays an important role. Persistence of Microalbuminuria over a period of time can lead to target organ damage.

## KEYWORDS

Microalbuminuria, Hypertension, Micral Strip test, Albuminuria

## INTRODUCTION:

Hypertension is a major public health concern and it is one of the major leading causes of premature death worldwide. It is estimated that nearly 1.13 billion people have hypertension worldwide.[1] Over the past decade there have been extensive research in regards to hypertension and extensive widespread patient education and health care professional's efforts have led to significant decreased mortality and morbidity rates from the multiple organ damage, arising from untreated hypertension over years.[1-4]

Diagnosis of Hypertension is done if the measured on two different days have higher levels of systolic and diastolic blood pressures. If the systolic blood pressure reading on both days is ≥140 mmHg and/or the diastolic blood pressure reading on both days is ≥90 mmHg, it is termed Hypertensive. Various causes of hypertension are there and it should be evaluated for the cause of hypertension. The quality of life of individual can be better if the blood pressure is Well-managed and well-controlled and patients with well controlled blood pressure have reduced risk of complications such as coronary artery disease, heart failure, cerebrovascular disease, and chronic kidney disease. Detection and diagnosis of hypertension cases early and maintaining healthy lifestyle including physical activities, quitting or no smoking helps in preventing future complication, apart from this appropriate and accurate anti-hypertensive medication usage have been shown to help prevent and control hypertension among adolescents.

Global prevalence for hypertension has increasing dramatically for over the past two decades. Globally, it is projected figure of 1.5 billion expected by 2025. The risk factors for developing of hypertension are categorised as modifiable and nonmodifiable risk factors. The modifiable risk factors which include diet, physical activity, consumption of alcohol and tobacco smoking, and obesity or overweight whereas the nonmodifiable risk factors are, family history of hypertension, age more than 65 years, and the presence of other comorbidities, including diabetes and chronic kidney diseases.[4-6]

The relationship between socioeconomic status and hypertension have been extensively studied worldwide. As the world is currently experiencing rapid advances in technological and rapidly increasing urban population, epidemiological changes experience in people living in urban areas, especially in regards with health issues, hence bringing focus of issues like noncommunicable diseases which includes hypertension and other diseases involving cardiovascular system. Due to rampant urbanisation, there have been changes in lifestyles towards becoming more sedentary, and this is worsening due to unhealthy diet, smoking, and alcohol consumption. These are the significant risk factors that could contribute to the development of hypertension among the urban population.[6]

Normal urine contains very little protein: usually, less than 10 mg/dL or 100 mg per 24 hours is excreted. Persistent microalbuminuria indicates a high probability of damage to the kidney glomerular filtration capacity. Albuminuria is the term used when albumin levels reach >200 mg/L in the urine. Microalbuminuria is the term used when albumin levels in the urine are 30-300 mg/L. Even though only a small amount of albumin is present in the urine in microalbuminuria, this can be an indicator that the patient has the beginnings of kidney damage. Patients with microalbuminuria have an elevated risk of developing progressive renal disease as well as increased risk of cardiovascular disease.

Wide variability in the incidence of microalbuminuria in various studies may be related to the severity and control of hypertension, selection criteria, racial differences etc. The relationship between blood pressure and risk of cardiovascular disease events is continuous, consistent and independent of other risk factors. Target organ damage resulting from hypertension includes those affecting the brain, heart, kidneys and the eyes.

With this background, our study was aimed to assess the prevalence of microalbuminuria among the nondiabetic hypertensive patients and to assess the relationship between microalbuminuria and target organ damage.

## MATERIAL AND METHODS:

The study was conducted for a period of three months. A predetermined proforma was used to record the details of history, physical examination and investigations. Microalbuminuria was assessed by urine Micral Strip test (Quick, early and reliable detection of albumin in urine). Micral test strip is based on an immunological test principle using gold-labelled monoclonal antibodies with a chromogenic colour indicator enabling confidence in results.

350 Patients were screened and only 200 patients were eligible based on the inclusion criteria. Data was collected and analysed by SPSS 14 software.

**INCLUSION CRITERIA:**

1) Age: 20 to 79 years 2) Patients who were under the treatment for essential hypertension 3) Newly diagnosed hypertensives, with systolic blood pressure >140 mm of Hg and Diastolic blood pressure > 90 mm Hg.

**EXCLUSION CRITERIA:**

1) History of Diabetes Mellitus 2) History of overt proteinuria 3) Known case of CAD, congestive cardiac failure 4) Past h/o of Known case of renal failure 5) Any history of urinary tract infections or Pyelonephritis leading to renal dysfunction 6) Any history of Neoplasm 9) Age less than 20 years and more than 80 years 10) Pregnant women were also excluded from the study.

**RESULTS & DISCUSSION:**

Out of 200 patients, 138 were males and 62 were females. Microalbuminuria was observed in 46 patients (32 in Men and 14 in females). Presence of microalbuminuria in different age groups was presented in Tabulated and given below, it is noted that people with age group more than 40 years and above have slightly highest tendency to develop microalbuminuria due to multiple factors.

| Sex | Number of cases | Microalbuminuria | % |
|---|---|---|---|
| Male | 138 | 32 | 21.9 |
| Female | 62 | 14 | 22.5 |

| Duration of Hypertension (in years) | Microalbuminuria | | Total |
|---|---|---|---|
| | Absent | Present | |
| Newly diagnosed HTN | 32 | 12 | 44 |
| <1 | 22 | 6 | 28 |
| 1- 5 | 58 | 4 | 62 |
| 5-10 | 10 | 6 | 16 |
| > 10 | 6 | 18 | 24 |
| unknown | 20 | 6 | 26 |
| Total | 158 | 32 | 200 |

| Age (in years) | Number of cases | Microalbuminuria | % |
|---|---|---|---|
| 20-29 | 10 | 0 | 0.0 |
| 30-39 | 12 | 0 | 0.0 |
| 40-49 | 40 | 6 | 15.0 |
| 50-59 | 58 | 22 | 37.93 |
| 60-69 | 62 | 18 | 29.03 |
| 70-79 | 18 | 4 | 22.22 |

This observational study finding was correlated with the Stalin et al study, in which majority of Microalbuminuria cases were found distributed among higher age group (60.6 ± 10.53 years).[7] In patient with Diagnosis of Hypertension the increased incidence of Microalbuminuria was there as the years pass by. In people with more than 10 years of Hypertension there were 18 patients developed Microalbuminuria which constituted nearly 75%, whereas in patient with 5 to 10years of hypertension the 37.5% of patients developed Microalbuminuria whereas in new onset of Hypertensive patients the proportion of patient had Microalbuminuria is 27.27%. In patient with less than 1 year duration of Hypertension the Microalbuminuria incidence was in 21.42%.

In the present study, there was no significant statistically difference between prevalence of microalbuminuria in men and women. Distribution of microalbuminuria among different groups, depending upon the duration of HTN was shown in below and it is clear that as the age progress the onset of microalbuminuria is increased in Hypertensive patient.

**CONCLUSION:**

Microalbuminuria incidence and prevalence increases with the advancement of age of patients, along with the duration and severity of hypertension also plays an important role. Persistence of Microalbuminuria over a period of time can lead to target organ damage. Extensive screening for microalbuminuria is the need of hour and it is also required to be assessed in all hypertensive subjects to assess the target organ risk which is predominantly cardiovascular.

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