



**ORIGINAL RESEARCH PAPER**

**General Medicine**

**A STUDY OF PREVALENCE OF MICROALBUMINURIA IN NON -DIABETIC, NON-HYPERTENSIVE MYOCARDIAL INFARCTION PATIENTS.**

**KEY WORDS:** micro albuminuria, myocardial infarction, non diabetic, non hypertensive

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**ABSTRACT**

**BACKGROUND:** Microalbuminuria is a predictor for cardiovascular risk in patients with diabetes and hypertension and thus these patients are routinely screened for microalbuminuria .The value of screening non diabetic and non hypertensives for microalbuminuria is unclear and yet to be established .The present study was to know the prevalence of microalbuminuria in non-diabetic, non-hypertensive acute myocardial infarction patients, to contribute to the existing knowledge of microalbuminuria as an early marker of endothelial dysfunction.

**MATERIALS AND METHODS:** The study was carried in Dr.PSIMS &RF , on 50 cases of established myocardial infarction who were non diabetic and non hypertensive.Urine sample was collected and analysed for Microalbuminuria and data was analysed using descriptive statistics,mean and Chi square test

**RESULTS:** Out of 50 patients presented with MI, Microalbuminuria is present in 78% of cases and absent in 22% of cases.54% had albuminuria in the range of 100-200 mg/L, 18% in the range of 201-300mg/L, and 6% in the range of 30-100mg/L.

**CONCLUSION:** This study shows an independent association between urinary albumin excretion and cardiovascular risk in non-diabetic, non-hypertensive subset of the population with myocardial infarction

**INTRODUCTION**

Microalbuminuria (MA) is defined as the urine albumin to the urine creatinine ratio (UACR) of 30-300 mg/g of creatinine (1). Microalbuminuria is a predictor of early renal damage in patients with diabetes mellitus. Previous studies have shown that MA is associated independently with cardiovascular morbidity and mortality in diabetic and hypertensive patients (2). Accordingly, the national and international guidelines recommend the screening for MA in patients with diabetes or hypertension (3,4).It has become increasingly evident that microalbuminuria associated with an increased risk of cardiovascular disease even in non-diabetic patients(5,6). In India, incidence of coronary artery disease has increased in the last two decades. Elsewhere Indian immigrants have a strikingly higher rate of coronary artery disease compared to the native population. Acute myocardial infarction occurs in them at an early age, i.e., before the age of 40 years even in the absence of traditional risk factors viz., hypertension, smoking, hypercholesterolemia.The relation between microalbuminuria and cardiovascular diseases is significant owing to the burden of cardiovascular morbidity and mortality.

The present study was to know the prevalence of microalbuminuria in non-diabetic, non-hypertensive acute myocardial infarction patients, to contribute to the existing knowledge of microalbuminuria as an early marker of endothelial dysfunction.

**MATERIALS AND METHODS**

A cross-sectional hospital- based study. was conducted from August 2016 to September 2018 in, Dr. Pinnamaneni Siddhartha Medical Sciences & RF, Chinnaoutpalli, Krishna Dist, Andhra Pradesh, India.Fifty non-diabetic and non-hypertensive patients of acute myocardial infarction were

included in the study after taking the consent .Sterile containers without preservative were used to collect the random mid-stream urine samples (10 ml), and assayed for microalbumin determined by Micral (semiquantitative method).

**INCLUSION CRITERIA:**

Patients of age group (40-70yrs), Non-diabetics, Non-hypertensives with myocardial infarction.

**EXCLUSION FROM THE STUDY:**

**PATIENTS WITH**

- a) Myocardial infarction following surgery
- b) major trauma,
- c) diabetes mellitus,
- d) hypertension (BP>140/90 mm Hg)
- e) any systemic infection,
- f) urinary tract infection
- g) inflammatory diseases like rheumatoid arthritis
- h) nephropathy

**PATIENT PREPARATION**

The patients, were educated about the study and written consent of the patients for participation in the study were obtained.

**INVESTIGATIONS PERFORMED**

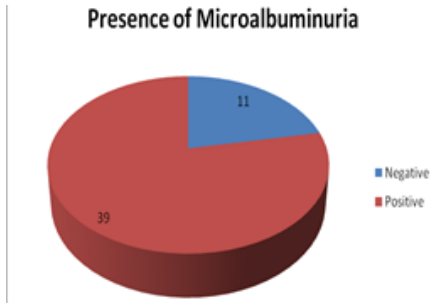
- Random blood sugar (RBS)
- HbA1c {glycated hemoglobin}
- Troponin-T
- Serum Creatinine
- Microalbumin in urine.
- Electrocardiogram
- Echocardiogram

**STATISTICAL ANALYSIS:**

Data were entered in MS-Excel and analyzed in SPSS V22. Descriptive statistics, represented with percentages, Mean with SD. Chi-square test and Fisher Exact test were applied to find significance. P<0.05 was considered as significant statistically.

**RESULTS**

I Out of 50 patients presented with MI, Microalbuminuria is present in 78% of cases and absent in 22% of cases



| MA                | Count | Percent |
|-------------------|-------|---------|
| Negative(<30mg/L) | 11    | 22%     |
| Mild(30-100mg/L)  | 3     | 6%      |
| Moderate(101-200) | 27    | 54%     |
| Severe(201-300)   | 9     | 18%     |
| Total             | 50    | 100%    |

**Descriptive Statistics**

|    | N  | Minimum | Maximum | Mean   | SD    |
|----|----|---------|---------|--------|-------|
| MA | 50 | 12.00   | 252.00  | 133.84 | 73.14 |

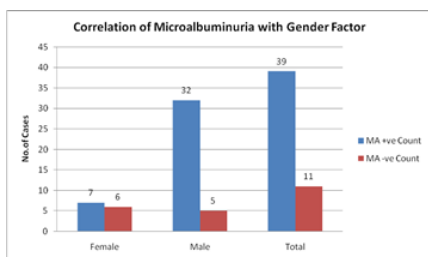
**II. CORRELATION OF MICROALBUMINURIA WITH SEX**

- Out of total 37 male patients, significantly positive micro albuminuria (p-value- 0.04) was seen in 32 patients. Microalbuminuria in males is mostly in the moderate range (24), 6 cases were in severe range.

**Table 2 correlation of microalbuminuria with sex**

| Sex    | MC       |      |          |        | Total |
|--------|----------|------|----------|--------|-------|
|        | Negative | Mild | Moderate | Severe |       |
| Female | 6        | 1    | 3        | 3      | 13    |
| Male   | 5        | 2    | 24       | 6      | 37    |
| Total  | 11       | 3    | 27       | 9      | 50    |

**P=0.04**



**III. CORRELATION OF MICROALBUMINURIA WITH SMOKING**

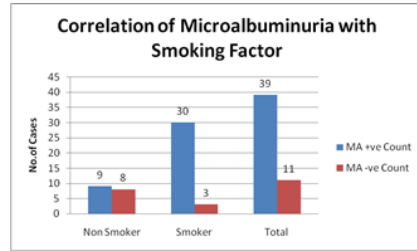
- Out of 33 smokers, 30 were microalbuminuria positive showing a significant p-value of 0.006, showing a strong correlation between smoking and microalbuminuria, they were in the range of mild (1), moderate (21), severe (8)

**Table-3 Correlation of Microalbuminuria with Smoking**

| Smoking    | MC       |      |          |        | Total |
|------------|----------|------|----------|--------|-------|
|            | Negative | Mild | Moderate | Severe |       |
| Non Smoker | 8        | 2    | 6        | 1      | 17    |

| Smoker | 3  | 1 | 21 | 8 | 33 |
|--------|----|---|----|---|----|
| Total  | 11 | 3 | 27 | 9 | 50 |

**P=0.006**



**DISCUSSION**

The urinary protein albumin, is increasingly recognised as the earliest sign of vascular damage in both the kidney and the heart. The phenomenon of albuminuria was known for more than 200 years and the association between kidney disease and MA dates to the epochal insights of Richard Bright in 1827(7). The prognostic value of MA for CVD was first established in patients with DM. The results from several studies has indicated that MAU is a marker of cardiovascular risk even in non-diabetic subjects. Moreover, several studies have demonstrated that MA is an independent predictor of cardiovascular morbidity and mortality in non-diabetic populations.

In patients with hypertension and diabetes renal impairment will be evaluated by MA in clinical practice. MA is closely associated with cardiovascular risk factors such as age, smoking, hypertension, diabetes, Dyslipidemia and lack of physical activity.

For the relationship between microalbuminuria and cardiovascular risk, several possible explanations had proposed. It is unlikely that MA per se is the cause of the observed increase in risk. Microalbuminuria, which is caused by glomerular capillary injury, may be a marker for diffuse endothelial dysfunction. It may lead to inflammatory responses and in turn start the atherosclerotic process(8). According to Steno hypothesis, albuminuria reflects a general vascular dysfunction and leakage of albumin and other plasma macromolecules such as low-density lipoproteins into the vessel wall that may lead to inflammatory responses and in turn start the atherosclerotic process. High sensitivity C-reactive protein has also found raised in the serum of general population having microalbuminuria, marking microalbuminuria as the useful indicator representing low-grade systemic inflammation and also a risk factor for cardiovascular system in apparently healthy individuals.

In a prospective population-derived cohort study(9), microalbuminuria in the absence of a CVD history, hypertension and diabetes was associated with an increased risk for incident cardiovascular events and mortality.

While Yudkin et al(5), considered that microalbuminuria was to be an independent risk indicator of cardiovascular disease, Gosling reported in his study that microalbuminuria helps to identify patients at risk of developing cardiovascular diseases, and it is considered a sensitive indicator of inflammation reflecting vascular permeability in the absence of renal disease(10). In his study, it revealed that more studies are required for a conclusion about microalbuminuria as an emerging cardiovascular risk factor. The ability of Microalbuminuria to predict adverse cardiovascular events is not only restricted to high-risk populations. In a low-risk population for CVD, this fact was supported by Hillege et al(11). They demonstrated that MAU could predict CVD and non-CVD mortality in a general population

In the present study, it found that microalbuminuria is signifi

cantly present in patients of myocardial infarction (78%) who are non-diabetic and non-hypertensives.

Our study results did not match with the percentage of patients with Microalbuminuria found in other studies. The reasons for the higher values might be due to the effect of risk factor smoking which was present in 66% (33/50) of patients.

Microalbuminuria itself does not establish cardiovascular events; but it serves as a marker for identifying those who may be at increased risk. The risk for major cardiovascular events increased at every level of urinary albumin excretion, including levels within the normal range. Thus according to Ruggenti and Remuzzi (12) the concept of normal or abnormal albuminuria should be abandoned, and the unifying term of albuminuria could be used to describe measurable amounts of albumin in the urine.

**CONCLUSION**

This study shows an association between urinary albumin excretion and cardiovascular risk in a strict non-diabetic non-hypertensive subset of the population with myocardial infarction.

As the present study was a cross-sectional survey, the causal relationship between albuminuria and CVD could not be made. Follow-up data are needed to establish further the prognostic value of microalbuminuria for cardiovascular disease in the population at large.

Therefore, although cost-effective studies of intervention for albuminuria in the general population are still required, it seems sensible to implement early screening strategies for the prevention and treatment of albuminuria in subjects with high-risk factors for albuminuria.

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