A Study on the Prevalence of the Microalbuminuria in non Diabetic, Normotensive Patients with the Acute Myocardial Infarction and to Predict Its Prognostic Significance

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Abstract

Background: *The excretion of albumin in urine of 30-300 mg/day is referred to as microalbuminuria, which is not be detected through ordinary urine assessments. The presence of increased Urinary albumin excretion (UAE) signals an growth inside the transcapillary leak rate of albumin and is consequently a marker of micro vascular disorder. Thus, microalbuminuria is an early reaction to myocardial infarction.*

Methods: *A health facility based totally descriptive study of a hundred patients of acute myocardial infarction became achieved to find the prevalence of microalbuminuria among non-diabetic normotensive individuals of acute Myocardial Infarction; to confirm its prognostic importance of in-hospital complications of the patients admitted; and to set up the correlation of microalbuminuria with cardiac biomarkers.*

Results: *Microalbuminuria check became positive in 87% patients. The prevalence of microalbuminuria in our study is about 87% and in hospital complications of the acute myocardial infarction patients occur statistically more in patients who are having persistent microalbuminuria on both day 1 and day 5 of urine protein estimation.*

Conclusions: *Microalbuminuria is more prevalent in patients with acute myocardial infarction patients. Hence, Microalbuminuria is a non specific yet high sensitive marker of myocardial infarction and it could be used as a further biochemical parameter in acute myocardial infarction patients who were non diabetics and can be used as a marker for predicting in-hospital complications*

Keywords: *Acute myocardial infarction, in-hospital complications, Microalbuminuria.*

Introduction

The excretion of albumin in urine, from about 30 to 300 mg/day is known as microalbuminuria. This precise range of the albumin in urine are not detected by way of typical urine assessments. The Microalbuminuria was known to be associated with diabetes mellitus over a period of time. In diabetes, microalbuminuria is an early predictor of renal dysfunction. It normally takes greater than 5 years in patients with type I diabetes to have microalbuminuria. Such patients go into mounted nephropathy later. The presence of extended Urinary albumin excretion signals an increase in trans-capillary escape rate of albumin and is

consequently a significant marker of micro vascular disease. Acute myocardial infarction is certainly one of most prevalent illnesses in hospitalized patients in developed international locations.

The morbidity and mortality rate following acute myocardial infarction is still on high. 1 in 25 sufferers who survives the preliminary duration of hospitalization dies in the 1st 12 months after acute myocardial infarction.[1] Microalbuminuria has been implicated as a sensitive indicator of non-renal disorder also. The association of microalbuminuria with coronary heart disease is very critical due to the large burden of cardiovascular morbidity and mortality on this country and additionally in abroad countries.[4] Myocardial infarction is the most important manifestation of cardiovascular diseases.

Microalbuminuria is an early response to myocardial infarction. Study by Berton et al implied that microalbuminuria happens in acute myocardial infarction and predicts the early mortality.[2,3]

In the descriptive study in western India in 2002, microalbuminuria determined to be related to intimal media thickening of carotid artery and coronary artery sickness. Also, studies indicate that microalbuminuria is also common in non-diabetic population and is located to be an unbiased indicator of cardiovascular disorder and mortality.[5,6]

Few studies had been carried out to assess microalbuminuria among the non-diabetic patients, specifically in India. In the prevailing study, a try has been made to examine if the microalbuminuria is found to be associated with acute myocardial infarction, even on non-diabetic population.

Microalbuminuria is defined as excretion of albumin within range from 30 to 300 mg /day in urine. It is not exclusive shape or fraction of albumin, but microalbuminuria is simply a totally small quantity of the albumin. Albumin is reasonably small and it is frequently the first protein to be present inside the urine after the kidney is affected. The table underneath gives the values which constitute microalbuminuria.[5,7]

The aims of the present study is to find out the prevalence of microalbuminuria in non-diabetic normotensive patients of acute Myocardial Infarction, and to discover the association between the extent of microalbuminuria and inhospital complications, and to discover the correlation of microalbuminuria with the cardiac biomarkers.

Category	Timed collection μg/min	24 hour collection (mg/24 hour)	Spot collection	
			μg/mg	μg/mmol
Normal	<20	<30	<30	<3.4
microalbuminuria	20- 200	30-300	30-300	3.4-33.9
macroalbuminuria	>200	>300	>300	>33.9

Materials and Methods

100 patients with clinically diagnosed acute myocardial infarction were selected from the CCU of Raja muthiah Medical College and Hospital, chidambaram. Clinical diagnosis was based on ECG finding and cardiac markers.

Study Design: hospital based descriptive study

Study Period: September 2016 to October 2018

Inclusion Criteria
1. Age 12 to 70 years
2. STEMI
3. NSTEMI

Exclusion Criteria
1. Hypertensives
2. Diabetics
3. Kidney disease
4. Drugs causing microalbuminuria
5. Multiple myeloma
6. Patients with acute febrile illness
7. Patients with, UTI, hematuria

The patients were admitted in CCU. Diagnosis of acute myocardial infarction was done after clinical presentation, ECG changes and raised cardio biomarker in form of CKMB. Patients ECG, CKMB, renal function tests, 24 hour urine

albumin were analysed on day one and day 5 of admission. The patients were educated about the study and written consent of the patients for participation in the study were obtained.

History, socioeconomic data were collected and recorded in structured proforma. demographic variables included age, sex, smoking and alcohol history, past history of any cardiovascular or renal disease and treatment history. Detailed general physical and systemic examinations were done.

All the patients were kept and observed in CCU for initial 2 to 3 days or more depending upon their clinical condition and then in a ward for total of 5 to 7 days. All the patients were treated with standard protocol drugs like antiplatelet agents, analgesics, thrombolytic therapy (if not contraindicated), beta blockers, statins and ACE inhibitors. Other Therapeutic measures were used in complicated cases as per their need
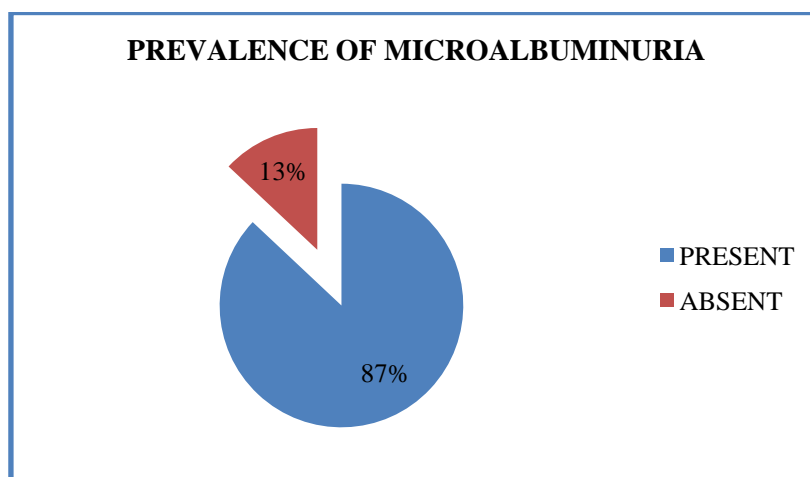
All clinical and laboratory data were obtained during the first week of hospitalisation. left ventricular ejection fraction was assessed in all patients on the second day. urinary albumin excretion was assessed in two 24 hour urinary collections, performed on the first and fifth days after admission. here urine albumin is measured by radio immuno assay.

The permission from the ethical commitee of Raja muthiah medical college was obtained.

Statistical Analysis

Descriptve and statistics were applied. In case of categorical variables chi square test was applied and incase of quantifiable variable independent T test was applied. Statistical analysis was done using SPSS- version 20.

Results
Table 1

Biochemical parameters	Mean value
RBS	122.08 ± 24.4551
CKMB	77.880 ± 68.0278
SBP	115.6 ± 9.4623
DBP	74.8 ± 6.4322
TOTAL CHOLESTEROL	178.44 ± 26.6046
TRIGYLCERIDES	142.28 ± 54.0804
LDL	120.96 ± 29.2664
HDL	41.78 ± 6.5883
BMI	24.16 ± 2.7299
24 HOUR URINE PROTEIN	117.31 ± 76.8870

Out of the 100 patients, 56% were male. The age groups 51 - 60 years has the highest number with 32 patients (32%). Of the 100 patients microalbuminuria was found in 87 patients (87%). mean random blood sugar among the patients with microalbuminuria is 124.46, whereas the mean random blood sugar among the patients without microalbuminuria is 106.15. The mean body mass index of patients with microalbuminuria is 24.45, whereas the mean body mass index of patients with microalbuminuria is 22.16. In this study total number of STEMI patients is 54 and total number of NSTEMI patients is 46. In this study the percentage of inhospital complications is 30% and patients without complications is 70 %

Figure 1

PREVALENCE OF MICROALBUMINURIA

13%
87%
■ PRESENT
■ ABSENT

Table 2 Socio-Demographic Characteristics

Age	Frequency	Percentage
1. ≤40	14	14
2. 41-50	28	28
3. 51-60	32	32
4. 61-70	26	26
Sex		
1. Males	66	66
2. Females	34	34
Diet		
1. Veg	28	28
2. Both	72	72
Personal History		
1.smoker	45	45
2.alcoholic	6	6
3. both	26	26
4. NIL	23	23

Discussion

In present study we take 100 patients diagnosed as acute myocardial infarction. Diagnosis of AMI done from clinical presentation, CKMB, ECG. We found that out of 100 patients 87 patients had microalbuminuria and there is significant proportion of patients having early in hospital complications. Studies which were conducted in past have mixed opinion regarding microalbuminuria and in hospital complications.

A Study of Safaa Ali Khudhair et al found that microalbuminuria is the significant predictor of in-hospital morbidity and mortality in patients with acute myocardial infarction.[9] Study carried by Abdul ghaffar etal found that the microalbuminuria may also have an association with Acute myocardial infarction in the absence of traditional risk factor like DM and Hypertension.[10] 97.77% smokers have presence of microalbuminuria on the first day of admission. From this study we can say that the level of urine microalbumin does not vary with the level of CK-MB. So, it is statistically non-significant.

All the cases in the present study has a normal renal function (Urea < 30 mg/dl and creatinine < 1.1 mg/dl). Therefore, microalbuminuria was not related to renal dysfunction in these patients. Our study in this respect agrees with the views of Peter Gosling, who considered it to be a sensitive indicator of non-renal disease.

Loannis Lekatsas et al found that Microalbuminuria is a significant predictor for in-hospital morbidity and mortality in first 7 days after myocardial infarction in non diabetic patients.[11] Lazzeri, Chiara et al studied that among hypertensive nondiabetic patients with ST elevation myocardial infarction, microalbuminuria to be present and found it does not yield prognostic information about in-hospital mortality or complications.[8]
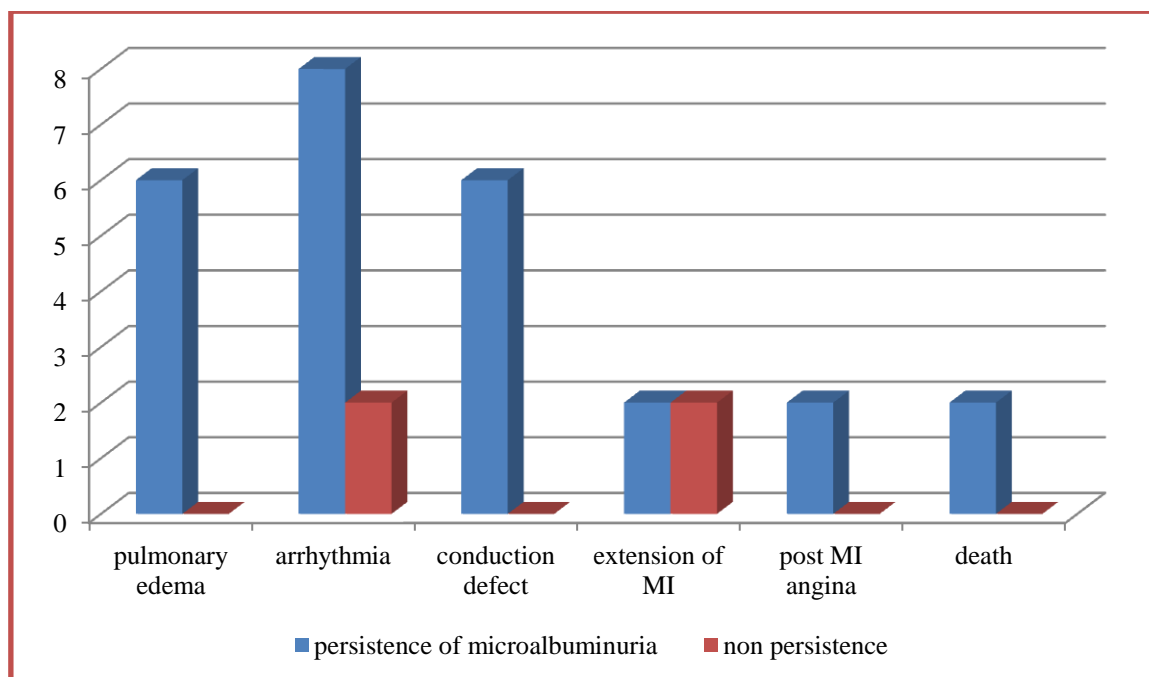
Microalbuminuria in prediction of inhospital morbidity and mortality:

The presence of microalbuminuria on the first day of acute myocardial infarction doesnt significantly predict the outcome of the development of in hospital complications versus the absence of microalbuminuria. whereas the presence of microalbuminuria ob both the first and fifth day of acute MI predicts the complications significantly.

Table 3 In-Hospital Complications in Patients with Acute Myocardial Infarction

Complications	Microalbuminuria					
	Present		Absent		Total	
	N	%	N	%	N	%
1.pulmonary edema	6	6.9	0	0	6	6
2.arrythmia	8	9.2	0	0	8	8
3.conduction defect	6	6.9	2	15.4	8	8
4.extension of MI	2	2.3	0	0	2	2
5.post MI angina	2	2.3	2	15.4	4	4
6.death	2	2.3	0	0	2	2
7.none	61	70.1	9	69.2	70	70
TOTAL	87	87	13	13	100	100

Figure 2

Early in hospital complications are in the form of Arrythmias, Conduction defects, Pulmonary edema, Post MI angina, Extention of MI and Death. 68% of patients have persistence of microalbuminuria on fifth day of urinary albumin estimation. Among them in hospital complications occur in about 86% of the patients.

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