Original Research Article

A study of prevalence of microalbuminuria in non-diabetic non-hypertensive coronary artery disease

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Abstract

Background: Microalbuminuria is a marker of widespread vascular damage in diabetic as well as non-diabetic patients. However, more and more evidence is accumulating that microalbuminuria is an important cardiovascular risk factor even in the general population. Its early detection helps in preventing the progression of cardiac decompensation. Aggressive treatment of microalbuminuria is associated with improved renal and cardiac functions.

Aim of the study: To find out the prevalence of microalbuminuria in non-diabetic and non-hypertensive patients with coronary artery disease.

Materials and methods: Prospective nonrandomized case series was done in the Department of General Medicine, GAAMCH, Karapettai, Kanchipuram in the year 2017. In this 50 non-diabetic and non-hypertensive CAD patients were selected from those admitted in General Medicine ward. Data collection was by clinical history, examination and investigations such as blood investigations- fasting blood sugar, blood urea, serum creatinine, serum electrolytes, fasting lipid profile, urine albumin, and deposits, chest X-ray PA view, ECG, Echo were done and reports were analyzed thoroughly.

Results: Among the males, 94.3% were smokers and 5.7% were non-smokers. 100% of women were non-smokers. There were 12 patients with abnormal total cholesterol, out of which 10 patients (83.33%) had microalbuminuria and out of 38 patients (73.68%) with normal total cholesterol, 28 had microalbuminuria. The observation showed that there was no significant association between total cholesterol and microalbuminuria (P>0.05).

Conclusion: Among the 50 non-diabetic non-hypertensive CAD patients, 38 patients (76%) had microalbuminuria. Microalbuminuria is positively associated with the ischemic heart disease in non-diabetic non-hypertensive CAD patients and can be regarded as an additional risk factor for ischemic heart disease. Hence screening for microalbuminuria is a worthwhile public tool for cardiac risk stratification and targeting preventive strategies.

Key words

CAD- Coronary artery disease, TGL- Triglycerides, HDL-High density lipoprotein, Smoking, Microalbuminuria.

Introduction

IHD which has an estimated prevalence of 6–9% in the general population in India may become the leading cause of mortality and morbidity in India in the next decade [1]. Since the pioneering work of Framingham study, many prospective and clinical studies have identified series of independent risk factors for ischemic heart disease among which age, male gender, a positive family history of premature atherosclerotic disease, cigarette smoking, diabetes mellitus, hypertension, dyslipidemia, obesity, physical inactivity are traditional risk factors [2]. The interest in improving cardiovascular risk assessment, resulting from a better understanding of the pathogenesis of atherosclerosis and identification of new targets for anti-atherosclerotic drug therapy has stimulated the search for novel risk factors [3]. One such novel risk factor is microalbuminuria which has emerged as an independent and robust risk factor. Microalbuminuria is a marker of widespread vascular damage in diabetic as well as non-diabetic patients. However more and more evidence is accumulating that microalbuminuria is an important cardiovascular risk factor even in the general population. Its early detection helps in preventing the progression of cardiac decompensation [4]. Aggressive treatment of microalbuminuria is associated with improved renal and cardiac functions.The present study is being conducted to determine the prevalence of microalbuminuria in non-diabetic and non-hypertensive ischemic heart disease patients and its association with other known cardiovascular risk factors [5].

Materials and methods

Prospective non-randomized case series was done in the Department of General Medicine, GAAMCH, Karapettai, Kanchipuram in the year 2017. In this study, 50 non-diabetic and non-hypertensive CAD patients were selected from those admitted in General Medicine ward. Data collection was by clinical history, examination and investigations such as blood investigations-fasting blood sugar, blood urea, serum creatinine, serum electrolytes, fasting lipid profile, urine albumin, and deposits, chest X-ray PA view, ECG, Echo were done and reports were analyzed thoroughly. Microalbuminuria was detected by the immunoturbidimetric method in early morning first voided urine. The reference range of normal microalbuminuria was 0 – 20 mg/l. Early morning first voided urine after discarding initial 10 – 20 ml of urine was collected using sterile plastic container and investigation was done within 2 hours of collection of urine.

Inclusion criteria: The diagnosis of coronary heart disease was based on 12 lead ECG, cardiac enzyme estimation, echocardiography and rose questionnaire. Normal values of Total cholesterol <200 mg/dl, HDL >40 mg/dl (Male), >50mg/dl (Female), TGL150 mg/dl, LDL <130 had been taken as the cut-off value for this study.

Exclusion criteria: Hypertension as defined by JNC VII and patients who were taking antihypertensive drugs. Diabetes mellitus defined as per ADA criteria, Patients with urinary tract infection, congestive cardiac failure, seizures, and fever, Urine showed – macroalbuminuria.

Statistical analysis

The data was presented as Mean ± 2SD. The limits of significance were calculated using SPSS version 13 software. Microsoft Word and Microsoft Excel were used to generate graphs, tables, etc.

Results

Fifty patients fulfilling the criteria for the study were included. The study was done over a period of nine months.

In the present study, out of 50 patients, 35 were male and 15 were female (**Table – 1**). The mean age of the study population was 55.8 ± 10.7 with the range of 26 – 75 years. The median age was 57 years. The mean age for males was 53.8±11.6 years and the same of females was 60.5 ± 6.7 years. The difference in mean was statistically significant (P <0.05). This interpretation revealed that males were affected by CAD earlier than females.

Table – 1: Sex distribution in study subjects.

Sex	No. of patients	%
Male	35	70%
Female	15	30%

Table – 2: Physiological, biochemical profile and microalbuminuria of the study subjects.

Variables	Mean	SD	Median	Mode
Systolic BP	115.6	9.5	120	110
Diastolic BP	74.8	6.5	80	80
Fasting blood sugar	100.0	8.6	100	100
Total Cholesterol	178.6	26.8	178.5	175
Triglycerides	144.5	51.1	137	110
HDL-C	42.6	3.8	42.5	40
LDL-C	123	24.8	120	120
Microalbuminuria	35.9	22.2	30	30

Table - 2 shows a description of the physiological measures. The Mean±SD, Median, Mode of each variables were represented. In this study, the major dyslipidemia was increased TGL, increased LDL and decreased HDL.

Table - 3 shows the components of lipid profile. The major dyslipidemia in the study subjects were increased TGL (36%), increased LDL (36%) and decreased HDL (30%).

There were 27 males (77.1%) and 11 females (73.4%) with abnormal microalbuminuria level in the present study. This showed that patients with microalbuminuria are having a higher risk of developing ischemic heart disease (**Table – 4**).

Table - 5 showed the prevalence of microalbuminuria among CAD patients as 76% and the same as the normal population was 15%. The difference between the two prevalence rates was statistically significant (P<0.001).

Discussion

Ischemic heart disease will become a major disease burden in India in the next decade. To target preventive strategies, risk stratification of the population should be effective. There are many reports emanating from the western literature about microalbuminuria as an independent risk factor for the development of IHD [6]. This study had 76% of male patients compared to 26% of female patients. This is in accordance with males are more prone to IHD than females. The mean age of the study population was 55.8±10.7 years. The median age was 57 years. The mean age of males was 53.8±11.6 years and the same of females was 60.5±6.7 years. The significant difference in mean age between the sexes shows that male is affected by coronary heart disease quite earlier than females [7]. All the females were in the post-menopausal age group, which shows that sex hormones have a protective effect as far as the cardiovascular system is concerned. Smoking is present in 66% of the study subjects. Among males 94.3% were smokers but none of the females were smokers. The smokers had been affected by the disease quite earlier than the nonsmokers, since the mean age of the smokers was 52.9±11 years and the mean age of nonsmokers was 61.5± 6.8 years. The difference between the mean was statistically highly significant (P <0.05) [8]. This indicates that smoking is an important risk factor for IHD.

Fuster V, et al. had found a prevalence of 41.6% in males and 29.5% in females in their study for smoking as a risk factor [9]. The mean fasting blood glucose was 100±8.6mg/dl, the mean systolic BP was 115.6±9.5mmHg, the mean diastolic BP- 74.8±6.5 mmHg indicating all patients are non-diabetic non-hypertensive. The mean Total cholesterol was 178±26.8, mean TGL was 144.5±51.1, mean HDL was 42.6±3.8, mean LDL was 123±24.8.The major dyslipidemia in the study subjects were increased TGL (36%), increased LDL (36%) and decreased HDL (30%) [10]. The present study showed that 76% of patients with IHD had microalbuminuria which shows a positive association. Smoking habit was not statistically significantly associated with microalbuminuria (P>0.05). The lipid profile was not statistically significantly associated with microalbuminuria (P>0.05) [11, 12].

Table – 3: Abnormal lipid parameters.

Lipid parameters	Male (n=35)		Female (n=15)		Total (n=50)	
	n	%	n	%	n	%
Total CHO (>200 mg%)	8	22.9	4	26.7	12	24
TGL (>150 mg%)	11	31.4	7	46.7	18	36
HDL (M<40 mg% F<50 mg%)	2	5.7	13	86.7	15	30
LDL (>130 mg%)	12	35.3	6	40	18	36

Table - 4: Levels of microalbuminuria (mg/L).

Microalbuminuria (mg/L)	Male (n=35)		Female (n=15)		Total (n=50)	
	n	%	n	%	n	%
<20	8	22.9	4	26.7	12	24%
20-40	18	51.4	7	46.7	25	50%
>40	9	25.7	4	26.7	13	26%

Table – 5: Prevalence of microalbuminuria in non-diabetic non-hypertensive cad patients.

Microalbuminuria	CAD Patients		Significance
	n	%	P < 0.001
Normal (<20mg/l)	12	24	
Abnormal (>20mg/l)	38	76	

Conclusion

Among the 50 non-diabetic non-hypertensive CAD patients, 38 patients (76%) had microalbuminuria. Microalbuminuria is positively associated with the Ischemic heart disease in non-diabetic non-hypertensive CAD patients and can be regarded as an additional risk factor for ischemic heart disease. Hence, screening for microalbuminuria is a worthwhile public tool for cardiac risk stratification and targeting preventive strategies.

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