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A Study On Microalbuminuria in Non-Diabetics and Normotensive Patients of Ischemic Heart Disease (IHD)

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Abstract

Background: Ischemic heart disease (IHD) account for large proportion of deaths and disabilities worldwide. Microalbuminuria is a known indicator of atherosclerosis and its association with ischemic heart disease (IHD) has been extensively studied. But the significance of urine microalbumin in non-diabetics, non-hypertensive ischemic heart disease, however, is yet to be elucidated. *Materials and Methods:* In present study 100 patients of ischemic heart disease (IHD) with no history of diabetes mellitus and hypertension were studied to ascertain the role of microalbuminuria as a marker of ischemic heart disease. *Results:* Out of all patients 85% were males and 15% females. In present study microalbuminuria (20–200 mg/L) was found in 69% of patients. *Conclusion:* In present study high microalbuminuria was observed in non-diabetic non-hypertensive ischemic heart disease patients.

Keywords: Microalbuminuria; Ischemic heart disease; Non-diabetes; Non-hypertensive.

Introduction

Ischemic heart disease is a disorders of the heart and blood vessels. They account for large proportion of deaths and disabilities worldwide. Ischemic heart disease (IHD) has now become one of the leading causes of death worldwide, accounting for more than 7.3 million deaths in 2008 alone.[1] Moreover, over 80% of cardiovascular deaths now occur from low- and middle-income countries.[2] As India is in the transition stage, facing dual burden of communicable and non-communicable diseases and 24% of deaths in India are accounted to cardiovascular etiology.[3] Currently 31.8 million Indians are living with Ischemic heart disease IHD, and the death rate from cardiovascular diseases in India has rose 111 time from 1990 to 2020,[4] with Ischemic heart disease (IHD) contributing the major share.[5]

The term microalbuminuria (MA) is confusing, as it does not reflect small albumin molecule but rather little more than usual or normal quantities of the molecule. Microalbuminuria (MA) is conventionally defined as urinary albumin excretion between 30–300 mg/24 hour for timed 24 hours urine collections and between 20–200 mg/L for untimed samples.[6] This range of albumin in urine cannot be detected by routine urine test. It is pertinent to note that these cut-off values have been primarily defined for proteinuria in diabetic individuals, and are yet to be rigorously validated in non-diabetic individuals.

In terms of a temporal model of association of biomarkers with evolving IHD,[7] urinary microalbumin occupies the early end of the spectrum, as an indicator of subclinical disease. The close association between microalbuminuria and coronary artery disease is readily explained by the shared pathogenetic mechanisms of endothelial dysfunction, systemic inflammation and vascular injury;[8] it is reasonable to assume that such a relationship should exist regardless of the

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concomitant presence or absence of diabetes. There is a paucity of data to establish a link in between 'microalbuminuria' and 'IHD with non-diabetics, normotensive patients'; as very few studies have been conducted; as compared to IHD patients with diabetic and/or coronary artery disease. With this background present study was conducted at tertiary care teaching hospital, to study the role of microalbuminuria in non-diabetics and normotensive patients of ischemic heart disease (IHD).

Materials and Methods

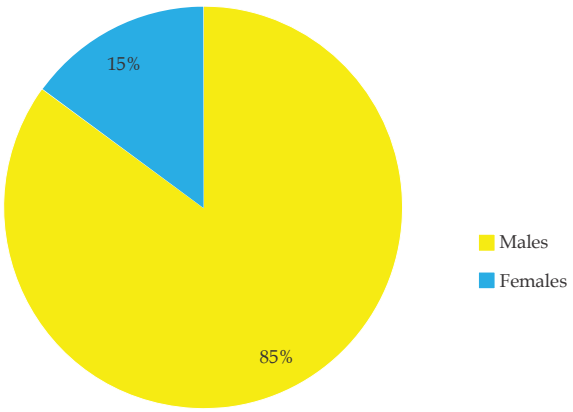
Institutional Ethics Committee (IEC) permission was obtained before commencement of study. This was a descriptive type of cross sectional study, conducted in the tertiary care teaching hospital of medical college of Madhya Pradesh. Present study was carried out in the intensive care unit (ICU) of Medicine department for the period of three years. In present study 100 patients of ischemic heart disease (IHD) with no history of diabetes mellitus and hypertension were included after written informed consent. Patients of kidney disease, congestive cardiac failure and in whom urine showing macroalbuminuria (dipstick test), RBC count > 50/μl and Leucocyte count > 75/μl were excluded from study. Females' patients who were pregnant or had vaginal discharge were also kept out of study. Early morning spot urine sample was collected by ensuring all due precaution, and microalbuminuria estimation was done by immunoturbidimetry method. Pre-structured and pre-determined proforma was used to collect information on patient's clinical history, examination and investigation.

Statistical Analysis

Data coding and entry was done in Microsoft Excel spread sheets and descriptive and inferential statistical analysis was done by using SPSS version 21 (Statistical Package for Social Sciences) software. The raw data was compiled, classified, presented in a tabulated manner to bring out important details. Quantitative and qualitative data were presented using mean, standard deviation, range and proportion, frequency count respectively. Fisher's exact test was used to find out association and 5% level of significance considered significant ($p < 0.05$).

Results

Total 100 patients of ischaemic heart disease who had no history of diabetes mellitus and hypertension were included in the present study. Out of all patients 85% were males and 15% females (Graph 1). Youngest and oldest patients were of 28 years and 85 years age. Mean age of males and females were 53.47 ± 13.82 years and 64 ± 12.89 years respectively. Most of the males and females were in the age group of 41–50 years and 61–70 years respectively (Table 1). In present study microalbuminuria (20–200 mg/L) was found in 69% of patients (Table 2). Most common complaint reported by patient was chest pain (86%) and 41% patients had breathlessness. Most of the patients of IHD presented with anterior wall MI followed by inferior wall MI (14%).



Graph 1: Genderwise distribution of the participants (n = 100).

Table 1: Age and Genderwise Distribution of the Participants (n = 100)

Sr. No.	Age groups (Yr.)	Males	Females	Total
1.	< 30	04 (04.7%)	00 (0.00%)	04
2.	3–40	14 (16.47%)	00 (0.00%)	14
3.	41–50	21 (24.70%)	03 (20.0%)	24
4.	51–60	18 (22.35%)	02 (13.13%)	21
5.	61–70	19 (23.52%)	06 (40.0%)	26
6.	71–80	08 (9.41%)	02 (13.13%)	10
7.	>80	01 (1.17%)	02 (13.13%)	03
8.	**Total**	**85 (85.0%)**	**15 (15.0%)**	**100 (100%)**

Table 2: Distribution of IHD Patients According to Urine Albumin Level (Mg/L)

Sr. No	Urinary Albumin (Mg/L)	No of patients (%)
1.	< 20 Mg/L	31 (31.0%)
2.	20–200 Mg/L	69 (69.0%)
	Total	**100 (100%)**

To check the association in between age and urine albumin level, patients were divided in two age groups; those who are more than and less than 60 years old. Out of 63 less than sixty years old patients 43 (68.25%) had microalbuminuria and out of 37 more than sixty years old patients, 70.27% (26) had microalbuminuria. Fisher's exact test showed non-significant association with age and urine albumin level (p = 1.00). Out of all male 71.76% (61) had urine albumin level in the range of 20–200 mg/L (microalbuminuria) while 53.33% (08) of females had microalbuminuria. Non-significant association was found in between level of microalbuminuria and gender of the patients (p = 0.22) In present study, 32 patients reported to have family history of ischemic heart diseases (IHD); and 68 reported no history of IHD in their family. Out of 32 patients of positive family history of IHD, 22 (68.75%) had microalbuminuria; while out of 68 patients of negative family history of IHD, 47 (69.11%) had microalbuminuria. No significant difference was seen in between family history of IHD and microalbuminuria on Fisher's exact test (p = 1.00) (Table 3).

Table 3: Distribution of Microalbuminuria in IHD Patients

Sr. No	Variable Absent (< 20 mg/L)		Microalbuminuria Present (20–200 mg/L)		p	Fischer's Exact Test
1.	Age (Yr.)	≤ 60	20	43	1.00	Non-significant
		> 60	11	26		
2.	Sex	Male	24	61	0.22	Non-significant
		Female	07	08		
3.	Family h/o IHD	Present	10	22	1.00	Non-significant
		Absent	21	47		
4.	Smoking	Present	11	28	0.66	Non-significant
		Absent	20	41		
5.	Alcohol	Present	05	18	0.31	Non-significant
		Absent	26	51		
6.	BMI	≤25	06	09	0.55	Non-significant
		>25	26	59		

Prevalence of smoking was seen 39% in present study. Out 85 males patients 43.52% (37) were smokers while out of 15 females 13.33% (02) were smokers. Out of all smokers 28 (71.79%) had microalbuminuria and 41 (67.21%) nonsmokers had microalbuminuria. Non-significant association was seen in between smoking addiction and microalbuminuria (p = 0.66). In this study habit of alcohol consumption was seen in 21 (24.70%) males and 02 (13.33%) females. Overall prevalence of alcohol consumption was seen in 23% of the patients. Microalbuminuria was seen 78.26% (18) patients with history of alcoholism while in those without history of alcoholism it was 66.23% (51). The difference was not significant (p = 0.31). In present study 15 participants had body mass index (BMI) less than 25 and 85 participants had BMI more than 25. Out of 15 who had less than 25 BMI 60% (09) had microalbuminuria and out of 85 whose BMI was more than 25, 69.41% (59) had microalbuminuria. The difference in between body mass index and urine albumin level was not statistical significant (p = 0.55).

Discussion

Ischemic heart disease became a major disease burden in India. To target preventive strategies, risk stratification of the population should be effective. Hitherto, microalbuminuria was considered as a marker of endothelial dysfunction in diabetes mellitus, but some studies have shown microalbuminuria as an effective marker of generalized vascular dysfunction even in non-diabetic population. Present cross sectional study was carried out in 100 patients of IHD with no history of diabetes mellitus and hypertension. To ascertain the role of microalbuminuria as a marker of ischemic heart disease was the main objective of

present study. In present study microalbuminuria (20–200 mg/L) was found in 69% of patients. In this study among the patients with IHD 85% of population were males and 15% were females. This is accordance with the knowledge that males are more prone for ischemic heart disease than females. In present study most common presenting complaint was chest pain (86%), followed by breathlessness (41%). Yudkin *et al.*,[10] reported chest pain as symptoms in 68% of the patients and breathless in 23% of patients.

Microalbuminuria was also seen in more in male as compared to females. Gould *et al*.[9] in their study, reported higher albumin excretion rate in males as compared to females. Study conducted by Romundstad *et al*.[11] and Gerstein *et al*.[12] also reported higher incidence of microalbuminuria in males as compared to females. In present study proportion of microalbuminuria was somewhat similar either in less than, or more than sixty years old patients. Damsgaard *et al*.[13] reported increased level of urine level of albumin excretion with age. In this study non-significant association was observed in between family history of IHD and microalbuminuria. Damsgaard *et al*.[13] reported significant association in between family history of IHD and microalbuminuria. Prevalence of microalbuminuria was found to be more in smokers than nonsmokers, but statistical association was non-significant. Rao *et al*.[14] reported statistical significant association in between smoking and microalbuminuria. In our study prevalence of microalbuminuria was found to be more in alcoholic than nonalcoholic but statistical association was non-significant. Gerstein *et al*.[12] also reported similar finding in his study. Present study reported non-significant association of microalbuminuria with body mass index. Rao *et al*.[14] also reported non-significant association in between BMI and microalbuminuria.

Conclusion

In present study high microalbuminuria was observed in non-diabetic non-hypertensive ischemic heart disease patients.

References

1. World Health Organization (WHO). Cardiovascular diseases, fact sheet number 317 [Internet]. Geneva, Switzerland: WHO; 2013, Available from: http://www.who.int/mediacentre/factsheets/fs317/en/ [Last accessed in 2015].
2. Alwan A, Maclean DR, Riley LM, *et al*. Monitoring and surveillance of chronic non-communicable diseases: Progress and capacity in high-burden countries. Lancet. 2010;376:1861–8.
3. Alwan A, Armstrong T, Cowan M, *et al.* Non-communicable diseases country profiles 2011 [Internet] 2011. [Last accessed in 2015]. Available from:http://whqlibdoc.who.int/publications/2011/9789241502283_eng.pdf .
4. Gaziano TA, Bitton A, Anand S, *et al*. Growing epidemic of coronary heart disease in low- and middle-income countries. Curr Probl Cardiol. 2010;35:72–115.
5. Smith SC, Jr. Reducing the global burden of ischemic heart disease and stroke: A challenge for the cardiovascular community and the United Nations. Circulation. 2011;124:278–9.
6. Bangstad HJ, Try K, Dahl JK, *et al*. New Semi quantitative dipstick test for Microalbuminuria. Diabetes care. 1991;14:1094–97.
7. Vasan RS. Biomarkers of cardiovascular disease: Molecular basis and practical considerations. Circulation 2006;113:2335–62.
8. Weir MR. Microalbuminuria and cardiovascular disease. Clin J Am SocNephrol. 2007;2:581–90.
9. Gould MM, Mohamed-Ali V, Goubet SA, *et al.* Associations ofurinary albumin excretion rate with vascular disease in europidnondiabetic subjects. J Diabetes Complications. 1994;8:180–88.
10. Yudkin JS, Forrest RD, Jackson CA. Microalbuminuria as predictor of vascular disease in non-diabetic subjects. Islington Diabetes Survey. Lancet. 1988;2:530–33.
11. Romundstad S, Holmen J, Kvenild K, *et al*. Microalbuminuria and all-cause mortality in 2,089 apparently healthy individuals: A 4.4-year-followup study. The Nord-Trondelag Health Study (HUNT), Norway. Am J Kidney Dis. 2003;42:466–73.
12. Gerstein HC, Mann JF, Yi Q, Zinman B, *et al.* Albuminuria and risk of cardiovascular events, death, and heart failure in diabetic and non-diabetic individuals. JAMA. 2001;286:421–26.
13. Damsgaard EM, Froland A, Jorgensen OD, *et al*. Microalbuminuria as predictor of increased mortality in elderly people. BMJ. 1990;300:297–300.
14. Rao BS, Rao AG. Estimation of the Prevalence of Microalbuminuria in Non-Diabetic Patients with Coronary Artery Disease (CAD). International Journal of scientific study. 2017;5(9):135–37.