A STUDY OF PREVALENCE OF MICROALBUMINURIA IN NON-DIABETIC ISCHEMIC HEART DISEASE

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ABSTRACT

BACKGROUND
Cardiovascular disorders are the most serious prevalent disorders and account for approximately 12 million deaths annually and is the commonest cause of death globally. Ischemic Heart Disease (IHD) causes more deaths and disability and incurs greater economic costs than any other illness in the developed world. IHD is a condition in which there is an inadequate supply of blood and oxygen to a portion of the myocardium; it typically occurs when there is an imbalance between myocardial oxygen supply and demand. Microalbuminuria is a known indicator of atherosclerosis and its association with IHD has been extensively studied in the diabetic population; however, significance of urinary micro albumin in non-diabetics is yet to be elucidated. The primary aim of this study was to study the prevalence of micro albuminuria in IHD.

METHODS
An observational cross-sectional study was conducted in the department of cardiology, Karnataka Institute of Medical Sciences. A total of 70 cases of newly detected Ischemic Heart Disease was included in the study based on inclusion and exclusion criteria. Data was compiled in MS Excel and was checked for its appropriateness and then analyzed.

RESULTS
Out of the total 70 cases, 43 (61.4%) were males and 27 (38.6%) were females. In our study, majority of the cases were in the age group of 51-60 yrs. which constituted 35.7% of the total cases studied. Out of the total cases, 52 (74.3%) cases had microalbuminuria. Mean microalbumin level was 61.89 ± 35.14. Out of a total of 70 cases, 55 cases (78.6%) had myocardial infarction and 15 cases (21.4%) had presentation of Unstable Angina. Amongst 55 cases of myocardial infarction, 42 cases (76.36%) had microalbuminuria and amongst 15 cases had unstable angina 10 cases (66.67%) had microalbuminuria. The mean level of microalbuminuria in infarct cases was 66.6 ± 36.37, and amongst ischemia cases was 44.64 ± 24.02. The calculated difference for mean level of microalbuminuria between ischemia and infarct cases was statistically significant (p<0.05).

CONCLUSIONS
Our study shows higher prevalence of microalbuminuria in Ischemic Heart Disease and can be regarded as an important additional risk factor for IHD and it is recommended to add this laboratory workup as a tool for primary prevention of IHD.

KEYWORDS
Microalbuminuria (MAU), Ischemic Heart Disease (IHD)


BACKGROUND
Cardiovascular disorders are some of the most serious disorders. Cardiovascular disease accounts for approximately 12 million deaths annually and is the commonest cause of death globally. Previously considered the disorder of the affluent, the past three decades have seen considerable decline in the incidence and prevalence of atherosclerotic coronary artery disease (CAD) in the industrialized western world, however this is becoming epidemic in developing world including India.¹ The situation is further grim by the fact that an estimated 31.8 million Indians currently live with ischemic heart disease (IHD); the death rate from cardiovascular disease in India is projected to rise by an astounding 111 percent over rates in 1990 by 2020.² IHD causes more deaths and disability and incurs greater economic costs than any other illness in the developed world. IHD is a condition in which there is an inadequate supply of blood and oxygen to a portion of the myocardium; it typically occurs when there is an imbalance between myocardial oxygen supply and demand.³ 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.⁴ One such novel risk factor is microalbuminuria (MAU).
albuninuria which has emerged as an independent and robust risk factor. Micro albuminuria is a well-accepted marker for micro and macro vascular damage in patients with diabetes mellitus. However more and more evidences is accumulating that micro albuminuria is an important cardiovascular risk factor even in the general population.\(^6\) Urine micro albumin has been extensively studied in diabetes mellitus and is now recognized as a marker for systemic atherosclerosis.\(^6\) Micro albuminuria is defined as a urinary albumin excretion of 30 mg/24 hours to 300 mg/24 hours or a urine albumin creatinine ratio of 30 mg/g to 300 mg/g in an early morning sample.\(^7\) The close association between micro albuminuria and coronary artery disease is explained by the shared pathogenetic mechanisms of endothelial dysfunction, systemic inflammation and vascular injury.\(^8\)

This study was conducted to determine the prevalence of micro albuminuria in ischemic heart disease in non-diabetics and compare the mean urine micro albumin between myocardial ischemia and infarct.

**METHODS**

This study was conducted in Department of cardiology, Karnataka Institute of Medical Sciences Hubli. This study was designed as an observational cross-sectional study. Study period was from January 2019 to June 2019. Total 70 cases were selected based on inclusion and exclusion criteria.

**Inclusion Criteria**
1. Age > 20 years.
2. Criteria for diagnosis of IHD were:
   a) Chest pain suggestive of angina.
   b) Electrocardiographic changes.
   c) Transthoracic echocardiographic changes.
   d) D) Biochemical markers.

**Exclusion Criteria**
1. Age < 20 years.
3. Presence of vaginal discharge in female patients.
4. Dipstick positive proteinuria.
5. >10 leucocytes or Red Blood Cells per high power field on microscopy.
6. Acute or Chronic renal failure.
7. Drugs like angiotensin converting enzyme inhibitors (ACEI) and angiotensin receptor blockers (ARBs).

Urine micro albumin levels were estimated in early morning spot urine sample and same sample was used to estimate urinary creatinine and urine micro albumin creatinine ratio was obtained and expressed in mg/g. Data was compiled in MS excel and was checked for it appropriateness and then analyzed. Unpaired student t test was used as statistical test for comparing mean levels of micro albuminuria in myocardial ischemia and infarct. P value less than 0.05 was considered statistically significant.

**RESULTS**

In the present study out of total 70 cases, majority of the cases were male 43(61.4%) and 27(38.6%) cases were female. Majority of the cases were in the age group 51-60 years 25 cases (35.7%), followed by 61-70 years 18 cases (25.7%), 41-50 years 11 cases (15.7%), 31-40 years 10 cases (14.3%), >70 years 4 cases (5.7%). In 2017 Rao BS et al in their study of micro albuminuria in coronary artery disease among non-diabetic individuals out of 60 subjects had 47 males (78.3%) and 13 females (21.7%).\(^9\)

**TABLE 1. Gender and Age Distribution of Cases**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>43</td>
<td>61.4</td>
</tr>
<tr>
<td>Female</td>
<td>27</td>
<td>38.6</td>
</tr>
</tbody>
</table>

**TABLE 2. Prevalence of Micro Albuminuria among IHD Cases**

<table>
<thead>
<tr>
<th>Micro Albuminuria</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>52</td>
<td>74.3</td>
</tr>
<tr>
<td>Absent</td>
<td>18</td>
<td>25.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean Albumin Levels</th>
<th>Frequency</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>61.89 ± 35.14</td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 3. Association of Micro Albuminuria with Ischemia and Infarct Cases**

<table>
<thead>
<tr>
<th>Micro Albuminuria</th>
<th>Frequency</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infarct</td>
<td>42(76.36%)</td>
<td>66.6</td>
</tr>
<tr>
<td>Ischemia</td>
<td>10(66.67%)</td>
<td>44.64</td>
</tr>
<tr>
<td>p value</td>
<td>0.0309</td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSION**

In the present study out of 70 cases studied, 43 cases (61.4%) were male and 27 cases (38.6%) were female. In 2017 Sunjayapradhep R.L. et al in their study of micro albuminuria in coronary artery disease among non-diabetic individuals out of 60 subjects had 47 males (78.3%) and 13 females (21.7%).\(^9\) In 2006 Hashim Rizwan et al in their study of one hundred non diabetic IHD had 73 males (73%) and 27 females (27%).\(^10\) In 2017 Rao BS et al in their study of non-diabetic patients with CAD had 78.3% males and 21.7% females.\(^11\)
In the present study the mean age of the cases were 54.19 ± 12.09 yrs. with majority of the cases belonging to the age group of 51-60 yrs. (35.7%). In 2015 Naha S et al in their study had the mean age group of 54.98 ± 11.2 yrs. In 2015 Patil Manish et al in their study, they found mean ages was 54.24 ± 11.44 yrs. with majority of the patients in the age group of 41-60 yrs. Rao BS et al in their study found the mean age among study subjects was 55.13 ± 9.95 yrs.

In the present study the prevalence of microalbuminuria in IHD cases was 74.3% and mean microalbumin levels amongst IHD cases was 61.89 ± 35.14. F Aziz et al in their study on microalbuminuria as predictor of severity of coronary artery disease in non-diabetic patients found the prevalence of microalbuminuria to be 56.5% in CAD patients. Rao BS et al in their study found the prevalence of microalbuminuria amongst CAD patients without diabetes to be 88.3% and mean microalbum level was 56.9 ± 30.4. Tab sum N et al in their study on microalbuminuria in non-diabetic CAD found the prevalence of microalbuminuria to be 60%.

In the present study mean micro albumin levels amongst infarct case was 66.6 ± 36.37 and amongst unstable angina case was 44.64 ± 24.02 and this difference of mean micro albumin levels amongst infarct cases and unstable angina cases was statistically significant (p <0.05). Patil Manish et al in their study found the mean micro albumin levels amongst ischemia cases to be 67.5 ± 7 and amongst infarct cases to be 98.09 ± 28.8 and this difference amongst mean micro albumin levels was statistically significant.

CONCLUSIONS
In our study, we found significantly high levels of microalbuminuria in IHD cases. Since the microalbumin is simple and inexpensive investigation, early identification may influence the strategy of management and ultimately may change the outcome of the disease. It is recommended to add this laboratory workup as a tool for primary prevention of IHD.

REFERENCES