Assessment of correlation of lipid profile and coronary angiography in coronary artery disease in Indian Population

1Dr J S Dhadwad, 2Dr N G Karandikar

1Assistant Professor, Department of Medicine, P. Dr. D Y Patil Medical College, Pimpri, Pune, India
2Professor, Department of Medicine, B J Medical College, Pune, India
Corresponding author: Dr J S Dhadwad

Abstract:

Introduction: There are several lines of evidence suggesting that postprandial lipemia increases the risk of atherogenesis. In the present study, we evaluated the correlation of lipid profile and coronary angiography in coronary artery disease.

Material & methods: In present study 50 patients of coronary artery disease who have undergone coronary angiography where selected for over a period of Dec.2003 to may 2005 with reference to lipid profile and coronary angiography.

Observations and results: 10(20%) out of 50 patients shows normal coronary angiography 38(76%) out of 50 patients shows significant stenosis out of which 62% male and 14% female.

Conclusion: From present study it may be concluded that low serum high-density lipoprotein level is associated with increased risk of coronary artery disease and coronary artery stenosis either significant or non-significant directly correlates with the postprandial lipid levels.

Introduction

Postprandial lipemia, characterized by a rise in triglycerides rich lipoproteins after eating, is a dynamic, nonsteady--state condition in which humans spend the majority of time. There are several lines of evidence suggesting that postprandial lipemia increases the risk of atherogenesis. Exchange of core lipids between postprandial lipoproteins and low density lipoprotein (LDL)/ high density lipoproteins (HDL) increased during prolonged lipemia, resulting in small, dense, LDL particles and reduced HDL cholesterol levels. Hemostatic variables, including clotting factors, platelet reactivity and monocyte cytokine expression, may be increased during p postprandial lipemia. In the present study, we evaluated the correlation of lipid profile and coronary angiography in coronary artery disease.

Material & methods:

In present study 50 patients of coronary artery disease who have undergone coronary angiography where selected for over a period of Dec.2003 to may 2005 with reference to clinical profile and lipid profile.

Inclusion Criteria: All patients of coronary artery disease who have undergone coronary angiography irrespective of their age and sex.
Exclusion Criteria:
Hepatic dysfunction
Acute & chronic pancreatitis
Deranged renal function
Congenital heart disease (CHD)
Diabetics moieties on insulin
Uncontrolled HTN

Coronary Angiography and lipid profile report collected and analyzed.
Sample size was determined by expert statistician.
Lipid profile (fasting and postfrontal):
1) Fasting sample—Collected after over night fast
2) Postprandial sample- collected after 8 hr of major meal.
3) Risk factor analysis
4) Correlation of risk factor and lipoprotein with clinical severity.
5) Coronary angiographic profile and lipoprotein profile correlation with severity.

Clinical profile
Detailed case history
Post history
History of risk factors
Family history of CAD

Observations
The present study of 50 patient of coronary artery disease who undergone coronary angiography with special preference to postprandial lipemia.

1. Risk factor for CHD

Table 1 Age and sex distribution (n=50)

<table>
<thead>
<tr>
<th>Age group</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-30</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>31-35</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>36-40</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td>&gt;40</td>
<td>34</td>
<td>8</td>
<td>42</td>
<td>84%</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>9</td>
<td>50</td>
<td>100%</td>
</tr>
</tbody>
</table>

2. Smoking (n=50)

<table>
<thead>
<tr>
<th>Class</th>
<th>No. of patients</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td>21</td>
<td>42%</td>
</tr>
<tr>
<td>Non smoker</td>
<td>29</td>
<td>58%</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100%</td>
</tr>
</tbody>
</table>

42% patients in this study were smoker (smokes 5-8 cigarettes/day since 10-15 years)
Percentage of non smoker is more in this study group i.e. 58%
3. Lipoprotein profile

<table>
<thead>
<tr>
<th>Lipoproteins (ATP III guideline)</th>
<th>No. of patients (%)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypercholesterolemia (TC&gt;200mg%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertriglyceridemia (TC&gt;200mg%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HDL &lt; 30 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LDL&lt;130mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VLDL &gt;40mg</td>
<td></td>
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</tr>
</tbody>
</table>

F- Fasting,  PP – Postprandial % percentage

From this 27(54%) out of 50 patients show hypercholesterolemia (TC>200mg%) after 8 hours of their major meal.

34(68%) out of 50 patients shows hypertriglyceridemia exaggerated response after 8 hours of their major meal. HDL < mg% 23 (46%) in fasting state and 28 (56%) in postprandial states.

4. Coronary angiographic profile ( n=50)

<table>
<thead>
<tr>
<th>Type of CAD</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant CAD</td>
<td>31</td>
<td>7</td>
<td>38</td>
<td>76%</td>
</tr>
<tr>
<td>Insignificant CAD</td>
<td>02</td>
<td>00</td>
<td>02</td>
<td>4%</td>
</tr>
<tr>
<td>Normal coronaries</td>
<td>07</td>
<td>03</td>
<td>10</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>10</td>
<td>50</td>
<td>100%</td>
</tr>
</tbody>
</table>

10(20%) out of 50 patients shows normal coronary angiography 38(76%) out of 50 patients shows significant stenosis out of which 62% male and 14% female.

Discussion

Coronary Artery Disease (CAD) is a major cause of premature death and disability throughout the world. Tobacco use is an important and an avertable cause of CAD. The use of tobacco is on the rise worldwide, especially among the youth [13]. The present study of 50 patient was indented to evaluate risk factors associated with coronary artery disease, clinical profile, lipid profile and relation between coronary angiography profile and lipid profile.In present study 84% of patient were ages of 40 years and above. Only 8% between 36-40 year, 4% between 31-35 years and 24-30 year. This is an agreement with other study conducted by Gohlke et al have shown the incidence tobe 67% in 35-39 age group and 8% below 30 year age.PK Biswas et al showed that 9.7% of patients in age group 20-30 year while 90.3% belong to 31-40 year of age.

KC Garg et al observed that out of 60 cases of aged 40 years and below were 20(33.3%) while of age 40 and above was 40 (66.6%). Even among the female both in our
study are above 40 years of age. The finding in present study are comparable to above studies which indicates that coronary artery disease is common after the age of 40 years.

In present study 50 patients of coronary artery disease out of which 41 (82%) were male, 9 (18%) were female. This is an agreement with 92% male affection has shown by Glover et al. In the present study it was found that 21 (40%) out of 50 were smoker and 29 (58%) were non-smoker. This agrees with Jaychandran et al. 1987 have found that 43% of CHD have hypercholesterolemia. Wasir et al. found 44% hyperlipidemia, to be the commonest risk factor of CHD.\(^6\)

10 (20%) patients shows hypertriglyceridemia in the fasting state while 34 (68%) of patients shows hypertriglyceridemia (TG > 200 mg%) in their postprandial state. Caullard et al. reported a significant association between the magnitude of the postprandial aTG response and fasting plasma HDL cholesterol concentration. However, the subject included in their study shown a wider range of fasting TG concentration (44-390 mg%) while in our study it was 85-280 mg%. Axelson et al. showed 50% greater TG response in CHD. The ARIC study extent that finding to a large sample men and women and support the interpretation of Axelson et al. that rise in lipoprotein is of intestinal origin.\(^7\)

23 (46%) patient shows LDL more than 180 mg% in their fasting state while 26 (52%) of patients shows LDL > 100 mg% in their postprandial state. 5 (10%) of patient in this study shows fasting VLDL > 40 mg% while 25 (50%) shows same in their postprandial state.

In the present study criteria of 70% or more of major coronary artery except left main (50% or more) was selected which was also the criteria in one and the biggest coronary angiographic study CASS. In present study 31 male (62%) and 7 female (14%) total 76% patients of CHD shows significant coronary involvement and 10 (20%) patients shows normal coronaries. Percentage of insignificant coronary involvement was 2%. This is an agreement with other studies conducted by Warren et al. 1979, Glover et al. 1982, Kaul et al. 1985, which shows that significant obstructive disease constitute largest group and there is definite male preponderance.\(^8\)

Relation between lipid profile and coronary angiography.

In this study patients with significant coronary angiographic involvement shown serum cholesterol 260±10, TG 230±12, HDL 28±2, LDL 92±5, while the profile in normal angiography, serum cholesterol 140±10, TG 160±10, HDL 30±7, LDL 65±5, VLDL 20±5. Suggestive exaggerated lipoprotein levels and especially in postprandial state in significant coronary angiographic involvement.

This agrees with ARIC study (The Atherosclerosis Risk In Communities). In the ARIC study they consider carotid thickness and derange lipid profile. There were 602 participants greater postprandial response in men exceeded that in women by 32%.\(^9\)
Conclusion

From present study it may be concluded that low serum high-density lipoprotein level is associated with increased risk of coronary artery disease and coronary artery stenosis either significant or non-significant directly correlates with the postprandial lipid levels.

References:
