Study of Apoprotein A1 in Acute Coronary Syndrome Patients

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Abstract: Background: This study was to determine whether the plasma level of apolipoprotein-A1(Apo-A1) is a better discriminator of coronary artery disease than the level of high density cholesterol(HDL). Methods: Blood samples were collected for Apo-A1 estimation at baseline from 75 patients with acute myocardial infarction (MI) and 75 patients with Unstable angina (UA) / Non ST elevation MI(NSTEMI) and age and sex matched 50 controls. Results: The level of plasma apolipoprotein A1 in 75 patients with acute MI was 99.00±18 mg/dl, which was significantly lower (<0.001) than the level in 50 controls 151.0±24 mg/dL. The level of plasma apoA1 in 75 patients with unstable angina / NSTEMI was 118±17 mg/dl, which was also lower (<0.001) than the level in 50 controls 151.0±24 mg/dL. The level of HDL cholesterol in acute coronary syndrome patients and controls was statistically not significant (p>0.05) i.e., 38.33±5.35 mg/dL, 39.33±3.09 mg/dL and 38.79±6.91 mg/dl respectively. Conclusion: This study underscores the importance of HDL-cholesterol in predicting the risk of coronary events and demonstrates protective effect of apo lipoprotein-A1.

Keywords: Apolipoprotein A1; Coronary artery disease; HDL; UA/ NSTEMI

1. Discussion

- The present study of Apo-A1 estimation in coronary heart disease was done on 150 patients and 50 controls in the Department of General Medicine, Government General Hospital, Guntur over a period of Feb 2016 – Feb 2019.
- The purpose of this prospective case control study was to assess the predictive value of apo-lipoprotein A1 as a marker of Coronary Heart Disease.
- Among the acute myocardial infarction group, total number of male patients was 49 (65.3%) and 26 female patients (34.7%) and in UA/NSTEMI, there were 59 male (80%) and 16 females (20%).
- In the acute myocardial infarction group the majority of cases were between 41-50 years and in UA/NSTEMI, the majority of cases were between 51 and 60 years of age. The mean age in AMI group, UA/NSTEMI group and control group was 49.4, 52.2 and 55.4 years respectively.
- The common presenting symptom in AMI and UA/NSTEMI was chest pain (100%). Only 5 patients presented with breathlessness in AMI group (6%).
- In the UA/ NSTEMI group 45 out of 75 patients (60%) had previous episodes of AMI (20 patients) or previous hospital admission for angina (25 patients).
- Common risk factor was smoking, which was present in 46% of AMI group, 60% of UA/NSTEMI group and 50% controls.
- Hypertension was a risk factor in 27% of patients in acute myocardial infarction group and 33% of patients with UA/NSTEMI group, no case in control group.
- Diabetes mellitus was seen in 16% of AMI and 13% of UA/ NSTEMI group, no case in control group.

2. Results

From above table, it is evident that Apo-A1 (mean 99±18 mg/dl) is significantly less than that of controls (151±24 mg/dl) (p<0.001) in acute myocardial infarction patients. Apo A1 value was significantly low in patients with UA/NSTEMI (112±15 mg/dl) when compared to controls (151±24 mg/dl) (p<0.001).

3. Summary

- In our study, family history of coronary heart disease was found in 24% in acute myocardial infarction and 13% of UA group and 10% of controls.
- Apo-A1 was measured by immuno-turbidimetric method.
- The apolipoproteins especially A1 and B are useful in discriminating coronary heart disease in the elderly when other lipids lost their discriminative value in the aged, as proved by Avagadro et al.
- HDL cholesterol has no relationship to the apo-A1 value and apo-A1 can be taken as an individual risk factor or marker in coronary heart disease.
- We have found a very little difference in HDL between AMI, NSTEMI and controls. This shows the inconsistency of HDL in predicting CHD as was previously thought.
- Patients who had chest pain had low levels of Apo A1, when compared to controls, though not as low when compared to patients who had previous episodes of MI.

<table>
<thead>
<tr>
<th></th>
<th>AMI</th>
<th>NSTEMI/ UA</th>
<th>CONTROLS</th>
<th>P VALUE</th>
<th>LEVEL OF SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APO A1</td>
<td>99±18 mg/dL</td>
<td>112±15 mg/dL</td>
<td>151±24 mg/dL</td>
<td>&lt;0.001</td>
<td>Highly significant</td>
</tr>
<tr>
<td>TOTAL CHOLESTEROL</td>
<td>208.07±17.280 mg/dl</td>
<td>182.32±25.46 mg/dl</td>
<td>156.68±28.08 mg/dl</td>
<td>&lt;0.001</td>
<td>Highly significant</td>
</tr>
</tbody>
</table>

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or previous episode of chest pain. It can be taken as a good discriminator for Coronary Heart Disease.

- Patients who have survived an attack of chest pain, had low levels of apolipoprotein A1 in the present study. This shows that low level of apo-A1 may be taken as a risk factor for coronary heart disease.
- Reisen et al. indicated that apo A and B levels, total cholesterol and LDL-cholesterol are good discriminators of severity of Coronary Heart Disease, while HDL-cholesterol is a more suitable parameter for epidemiological studies.
- A strong and significant inverse association exists between HDL-C and MI even after accounting for a large number of other coronary risk factors.

4. Conclusion

From the above study we conclude that apolipoprotein-A1 is a better predictive marker of coronary heart disease than HDL.

References

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