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 (p<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 (p<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 group, 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.

	AMI	NSTEMI/ UA	CONTROLS	P VALUE	LEVEL OF SIGNIFICANCE
APO A1	99±18 mg/dL	112±15 mg/dL	151±24 mg/dL	<0.001	Highly significant
TOTAL CHOLESTEROL	208.07 ± 17.28057	182.32 ±25.46	156.68±28.08	<0.0001	Highly significant

HDL CHOLESTEROL	39.86 ±5.29	39.05±3.28	40.79±6.50	>0.05	Not significant
LDL CHOLESTEROL	121.21 ± 17.24676	111.90±25.26	74.05±27.48	<0.0001	Highly significant
TRIGLYCERIDES	211.67 ± 59.89853	165.73±33.48	100.97±25.061	<0.0001	Highly significant

- 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-turbidometric method.

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

- 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

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.

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