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Original Research Article

Lipoprotein (A) Levels in Patients of Acute Coronary Syndrome Admitted in Coronary Care Unit, S P Medical College, Bikaner, Rajasthan

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Abstract:

Introduction: High levels of lipoprotein(a) [Lp(a)] are associated with increased risk of acute coronary syndrome (ACS). We explored whether Lp(a) exhibits a association with ACS.

Methods: Hospital based cross-sectional study. Was conducted on 100 patients with acute coronary acute coronary syndrome (ACS). The serum lipo-protein(A) level was measure and ECG was done at the time of admission and repeated as necessary. Lp (a) was measure by antigen antibody agglutination test.

Results: 49% patients were belong to age group 41-60 Yrs followed by 47% patients were more than 60 Yrs age group. 53% patients were male and 47% patients were female . 50% patients were belong to middle socio-economic status and 40% patients were belong to upper socio-economic status. 58% patients were obese followed by 37% patients BMI was normal and 5.00% patients were morbid obesity.31.00% patients were present with positive family history. 36% patients were present with positive smoking history. 30% patients were present with positive Tobacco chewing history. 25% patients were present with positive alcohol history. SBP was 128.02±11.06 mm of Hg and DBP was 80.02±8.01 mm of Hg. FBS was 110.06±19.36 mg/dl and PPBS was 165.39±34.02 mg/dl. Serum cholesterol was 185.36±43.28 mg/dl,Serum triglyceride was 151.23±60.35 mg/dl, LDL was 107.58±36.24 mg/dl and HDL was 44.23±7.14 mg/dl. lipo-a was 51.77±11.23mg/dl. The association between age and lipo-protein a level was found statistically significant(p value 0.001). The association between sex and lipo-protein a level was found statistically Insignificant(p value 0.321).

Conclusion: Lp(a) seems to be an independent risk factor for acute coronary syndrome (ACS), and high Lp(a) levels increased the risk for acute coronary syndrome (ACS).

Introduction

Lipoprotein(a) was described in human plasma by Berg as a genetic variant of βlipoprotein. [1] Lp(a) is an LDL like molecule consisting of an apoprotein (apo) B100 particle attached by a disulphide bridge to apo(a). Apo(a) is a member of a family of "kringle" containing proteins, such as plasminogen, tissue platelet activator (tPA), prothrombin, factor XII, and macrophage stimulating factor (MSF). [2-3] Lp(a) shares a high degree of sequence identity with plasminogen. Lp(a) values can be increased as part of the acute phase response, and in diabetes mellitus, chronic renal failure, nephrotic syndrome, cancer, menopause, and hypothyroidism. Lp(a) values are decreased in liver failure and hyperthyroidism. Furthermore, nicotinic acid, tamoxifen, oestrogens, progesterone, and anabolic steroids might decrease Lp(a) concentrations. Fibrates have been shown, in some studies, to reduce Lp(a) concentrations, whereas statins might increase Lp(a) concentrations. [4]

High levels of lipoprotein(a) [Lp(a)] are associated with increased risk of acute coronary syndrome (ACS). We explored whether Lp(a) exhibits a stronger association with ACS.

Aims and Objectives

- To estimate the Lipo-protein(A) in acute coronary syndrome patient.
- To determine the socio-demographic profile of acute coronary syndrome Patients.
- To determine the clinical profile of acute coronary syndrome patients .

Material and Methods

Study design: Hospital based cross-sectional observational analytic study.

Study place: Coronary care unit , department of cardiology, S.P. Medical College and P.B.M. Associated Group of Hospitals, Bikaner

Sample size: Sample size of 93 patients required at 80% study power and alpha error 5%. It is round of 100 patients for present study expecting approx. 5% not willing to study when 6.5% (3-10%) prevalence of acute coronary syndrome in India. (Shiv Shankar Singh S et al)

Sampling Method: Simple random sampling

Inclusion Criteria:

- Cases were willing to participate in study.
- Age more than 18 Yrs and less than 80 Yrs
- All cases presented with symptoms suggestive of ACS

Exclusion Criteria:

- Cases was not willing to participate in study
- Those cases with proven noncardiac chest pain
- All patients on drugs those effected the level of lopo-protein (A)
- Patient's age less than 18 years and 80 years was exclude from the study.

Data Collection:

- Detailed history was taken in each patient and information of every patient was recorded in a separate proforma.
- The serum lipo-protein(A) level was measure and ECG was done at the time of admission and repeated as necessary.
- Lp (a) was measure by agglutination due to an antigen – antibody reaction between Lp (a) in a sample and anti-Lp (a) antibody absorbed to latex particles.

Results

Table 1: Socio-demographic profile

Mean age in yrs	56.36±9.63
Male : Female	53:47
BMI in kg/mt2	26.39±2.01
Family history present	31.00%
Smoking	36.00%
Alcoholic	27.00%
FBS in mg/dl	110.06±19.36
PPBS in mg/dl	165.39±34.02
Triglyceride in mg/dl	151.23±60.35
Cholesterol in mg/dl	185.36±43.28
LDL in mg/dl	107.58±36.24
HDL in mg/dl	42.12±7.24

Table 2: Lipo-a wise distribution of study subjects

Lipo-a in mg/dl	
Mean	51.77
SD	11.23

In present study, FBS was 110.06±19.36 mg/dl and PPBS was 165.39±34.02 mg/dl. A fasting blood sugar level of 99 mg/dL or lower is normal, 100 to 125 mg/dL indicates you have prediabetes, and 126 mg/dL or higher indicates you have diabetes. Postpardina blood sugar level of 140 mg/dL or higher indicates diabetes. Serum total cholesterol: was measured by Enzymatic method Normal serum cholesterol: 150-250 mg/dl. Serum HDL cholesterol: was measured by "Phosphotungstate method. Normal HDL – Cholesterol: 30 – 70 mg/dl. Serum LDL cholesterol: If the value of Triglycerides is known, LDL-cholesterol can be calculated based on Friedewald" sequation. Serum Triglycerides: was measured by enzymatic colorimetric method Normal Serum Triglycerides: Male: 60-165 mg/dl Female: 40-140 mg/dl. Lipo-a was 51.77±11.23mg/dl.

Discussion

In present study, lipo-a was 51.77±11.23 mg/dl. Our study has highlighted few important aspects. Firstly, it strengthens that Pakistani patients with CVD have significantly higher mean Lp(a) levels as compared to their counterpart with normal coronary arteries.90 Our study adds to the already existing similar evidence proven by Pakistani researchers91 but with improved methodology that both cases and controls were exactly classified on the basis of coronary angiography. The 30 mg/ dl cutoff of high Lp(a) we used is consistent with recommendation generated by EPIC-Norfolk data that suggests that Lp(a) level between 24-36 mg/dl should be used to estimate risk of coronary artery disease. [5]

Recently, a large cross-sectional study in seven different ethnicities from INTERHEART project [6] also established that patients with first acute MI have high mean Lp(a) levels. Persons with high Lp(a) levels (>50 mg/dl) had 48% higher odds of having acute MI as compared to controls, and this association was independent from other risk factors of coronary artery disease. South-Asians have high population attributable risk (9-10%) due to high prevalence of elevated Lp(a) in this population. The odds ratio of having an acute MI with Lp(a) >50 mg/dl was 1.48 in whole INTERHEART population, but it was not reported separately for South Asian population. Our study had higher odds of acute coronary syndrome (2.7 in whole study population, and 3.65 in patients

younger than 45 years) with Lp(a) cutoff of 30 mg/dl as high. Taking this cutoff at 50 mg/dl also yielded OR 2.08 (not shown in results) that is also higher 52 than collective INTERHEART data. This reflects important association of Lp(a) with acute coronary syndrome in Pakistani population, and more so in patients ≤45 years of age. A large scale cross sectional study PROMIS (Pakistan Risk Of Myocardial Infarction Study) involving 9015 Pakistani patients with acute MI and 8629 matched controls analyzed various biochemical and genetic variants with coronary artery disease, reported that OR of ischemic heart disease increases by 1.10 per 1 SD increase in Lp(a) concentration, even after adjusting for Lp(a) isoform and conventional lipids concentration. [7]

Lipoprotein(a) has been recognised as an important genetically determined risk factor for development of atherosclerotic cardiovascular disease. Recent European and American guidelines have been identified lipoprotein (a) as a risk enhancing factor for development of ASCVD. Lipoprotein(a) is not commonly measured in clinical practice in part because no currently available treatment exist with established benefit of vascular outcome. There are several goal of Lipoprotein(a) study including characteristic of Lipoprotein(a) pattern in a large secondary prevention population and increasing awareness of the importance of Lipoprotein(a) as a risk factor for ASCVD. This study also identify the patients of increased level of Lipoprotein(a) for treatment and secondary prevention of pre-existing of coronary artery disease.

Conclusion

Lp(a) seems to be an independent risk factor for acute coronary syndrome (ACS), and high Lp(a) levels increased the risk for acute coronary syndrome (ACS).

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