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Comparative Study of Lipoprotein (a) Levels in Patients with and without Acute Coronary Syndrome (ACS)

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Abstract

Background: Cardiovascular diseases (CVD), particularly acute coronary syndrome (ACS), remain a major cause of morbidity and mortality. Lipoprotein (a) [Lp(a)] is a potential independent risk factor for cardiovascular events. This study compared Lp(a) levels and lipid profiles in ACS and non-ACS patients in a tertiary care setting.

Methods: A cross-sectional study was conducted at Ramaiah Medical College, including 118 participants categorized into ACS (n=59) and non-ACS (n=59) groups. Data on demographics and lipid profiles—total cholesterol (TC), low-density lipoprotein (LDL), triglycerides (TGL), high-density lipoprotein (HDL)—along with Lp(a) levels were collected. Independent t-tests and Chi-square tests were used for comparisons.

Results: The mean Lp(a) levels were 48.78 mg/dL in the ACS group and 41.59 mg/dL in the non-ACS group (p=0.770), showing no significant difference. LDL levels were higher in the ACS group (115.15 vs. 101.22 mg/dL, p=0.150), as were triglycerides (157.42 vs. 148.98 mg/dL, p=0.570), though neither was statistically significant.

However, the ACS group was significantly older (63.39 vs. 54.95 years, p=0.0003). A higher proportion of ACS patients were male (74.6% vs. 59.3%), but the difference was not statistically significant (p=0.130).

Conclusions: Lp(a) levels did not significantly differ between ACS and non-ACS patients. While LDL and TGL levels were higher in ACS patients, they lacked statistical significance. Older age was significantly associated with ACS. Further studies are needed to explore Lp(a) and lipid parameters in ACS risk stratification.

Keywords: Lipoprotein(a), Acute Coronary Syndrome, LDL, Triglycerides, Cardiovascular Risk

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1. Introduction

Cardiovascular diseases (CVD) remain a major global health challenge, with ACS being a leading contributor to morbidity and mortality. Lipoprotein(a) [Lp(a)] has been identified as an independent cardiovascular risk factor, potentially contributing to atherosclerosis and thrombogenesis. While elevated LDL and TGL levels are well-established contributors to ACS, the specific role of Lp(a) remains unclear. This study aimed to compare Lp(a), LDL, and TGL levels in ACS and non-ACS patients in a tertiary care setting.

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2. Materials and Methods

Study Design and Setting: This cross-sectional study was conducted at Ramaiah Medical College.

Study Population:

- **Inclusion Criteria:** Adults (≥18 years) diagnosed with ACS (myocardial infarction or unstable angina) and non-ACS patients presenting for routine cardiovascular evaluation.
- **Exclusion Criteria:** Patients with known genetic lipid disorders, inflammatory conditions affecting lipid metabolism, and severe comorbidities with a life expectancy <6 months.

Data Collection:

- **Clinical and Demographic Data:** Age, sex, medical history, medications.
- **Lipid Profile Analysis:** Fasting blood samples analyzed for TC, LDL, HDL, TGL, and Lp(a) at the central lab.

Statistical Analysis:

- Independent t-tests were used for continuous variables.
- Chi-square tests were used for categorical comparisons.
- Significance threshold set at $p < 0.05$.

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3. Results

3.1 Demographic Characteristics

Characteristic	ACS Group (n=59)	Non-ACS Group (n=59)	p-value
Age (years)	63.39 ± 12.98	54.95 ± 11.17	0.0003
Male (%)	74.60%	59.30%	0.13

3.2 Lipid Profiles and Lp(a) Levels

Variable (mg/dL)	ACS Group (n=59)	Non-ACS Group (n=59)	p-value
Lipoprotein(a)	48.78 ± 26.71	41.59 ± 51.58	0.77
LDL	115.15 ± 48.38	101.22 ± 44.45	0.15
Triglycerides	157.42 ± 80.68	148.98 ± 77.15	0.57

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4. Discussion

This study did not find a statistically significant difference in Lp(a) levels between ACS and non-ACS patients. However, the trend of higher LDL and TGL levels in ACS patients aligns with established cardiovascular risk factors. The significantly older age of ACS patients suggests an age-related impact on disease development. Possible reasons for non-significant findings include:

1. **Sample Size:** A larger cohort may be needed to detect statistically significant differences.
2. **Heterogeneity of ACS:** Variability in ACS subtypes may dilute lipid parameter effects.
3. **Other Risk Factors:** Hypertension, diabetes, and smoking, which were not accounted for in this study, may have influenced results.

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5. Limitations

- Cross-sectional design limits causal inference.
- Single-center study restricts generalizability.

- Lack of detailed cardiovascular risk factor adjustments.
- Sample size may limit statistical power.

6. Conclusion

Although Lp(a) levels were not significantly different between ACS and non-ACS groups, a trend towards higher LDL and TGL levels in ACS patients was observed. Older age was significantly associated with ACS. Future multi-center, prospective studies with larger sample sizes and comprehensive cardiovascular risk assessments are required to better establish the clinical significance of these lipid markers.

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Conflict of Interest Statement None declared.

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References

- 1. Cai G, Huang Z, Zhang B, Yu L, Li L. Elevated lipoprotein (a) levels are associated with the acute myocardial infarction in patients with normal low-density lipoprotein cholesterol levels. Biosci Rep [Internet]. 2019 [cited 2024 May 16];39(4). Available from: https://pubmed.ncbi.nlm.nih.gov/30894407/
- 2. Hanif S, Akhtar B, Afzal MN. Serum Lipoprotein (a) levels in acute coronary syndrome; Comparison of younger and elderly patients with healthy controls: Serum Lipoprotein (a) in ACS. Pak J Med Sci Q [Internet]. 2019 [cited 2024 May 16];35(6):1718. Available from: http://dx.doi.org/10.12669/pjms.35.6.377
- 3. Kamstrup PR, Benn M, Tybjærg-Hansen A, Nordestgaard BG. Extreme lipoprotein(a) levels and risk of myocardial infarction in the general population: The Copenhagen City Heart Study. Circulation [Internet]. 2008;117(2):176–84. Available from: http://dx.doi.org/10.1161/circulationaha.107.715698
- 4. Rosenson RS, Brewer HB, Rader DJ. Lipoproteins as biomarkers and therapeutic targets in the setting of acute coronary syndrome. Circ Res [Internet]. 2014;114(12):1880–9. Available from: http://dx.doi.org/10.1161/circresaha.114.302805
- 5. Schwartz GG, Ballantyne CM, Barter PJ, Kallend D, Leiter LA, Leitersdorf E, et al. Association of lipoprotein(a) with risk of recurrent ischemic events following acute coronary syndrome: Analysis of the dal-outcomes randomized clinical trial. JAMA

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Cardiol [Internet]. 2018 [cited 2024 May 16];3(2):164. Available from: https://jamanetwork.com/journals/jamacardiology/fullarticle/2659486.