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LDL/HDL Cholesterol Ratio - Significance in Prognosis of Acute Myocardial Infarction

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ABSTRACT
Coronary artery disease emerged as the major cardiovascular disorders of the era, becoming the most common cause of premature death. Study of its risk factors and their association with complication helps in monitoring the prognosis and preventing the complications and death in AMI
Keywords: *LDLc, HDLc, AMI, STEMI , NSTEMI , UA.*

INTRODUCTION

In developing countries like India, its prevalence is in step ascent, and threatening to overtake malnutrition and infectious diseases as the major cause of death.

Thus myocardial infarction remains an important health problem, and merits continued attention from basic and clinical researchers, epidemiologists and practicing physicians. The advancement of pathophysiology of atherosclerotic vascular diseases have brought new insight regarding potential indicators of underlying hidden atherosclerosis and cardiovascular risk. For atherosclerosis event various factors like Total cholesterol, LDL cholesterol, HDL cholesterol, Triglycerides, homocysteine, and various modifiable and non modifiable risk factors play a major role. This study relates to the significance of LDL/HDL Cholesterol Ratio in prognosis of Acute Myocardial Infarction.

METHODOLOGY

This prospective study was done on Patients who have been diagnosed as acute myocardial infarction (STEMI or UA or NSTEMI) and admitted to CCU and ICU of Rajah Muthiah Medical College and Hospital.

Diagnosis of Acute myocardial infarction was made by

- History – sudden onset of chest pain, pain more than 20 mins, pain at rest. +
- Elevated biochemical markers – CKMB, cardiac Troponin, +
- Electrocardiogry

ST segment elevation in leads,

Lead I, AVL, II, III, AVF, V_4-V_6

→ >0.1mV in 2 contiguous leads.

Lead V_2-V_3 → ≥ 0.2 mV (2 mm) in two contiguous leads.

ST depression - ≥ 0.05mV (0.5mm) in two contiguous leads.

T wave inversion - ≥ 0.1mV (1mm) in two contiguous leads.

Apart from routine blood investigations, Lipid Profile, CKMB, TROPONIN T, electrocardiography and echocardiography was done in all patients. All patients were followed up during hospitals stay and observed for the development of complications.

Estimation of lipid profile:

Lipid profile was done. Total cholesterol, Triglycerides, LDL cholesterol and HDL cholesterol were estimated by CHOD/POD, semi auto analyzers - 540 nm calorimetric method.

Lipid abnormalities:

Is marked as anyone of the below criteria

- Total cholesterol ≥ 150 mg /dl
- Triglyceride ≥ 150 mg /dl
- LDL cholesterol ≥ 100 mg /dl
- HDL cholesterol < 40 mg /dl
- LDLc / HDLc > 3

OBSERVATIONS AND RESULTS

Out of 100 patients with acute myocardial infarction, 68 patients had STEMI and 32 patients had UA or NSTEMI.

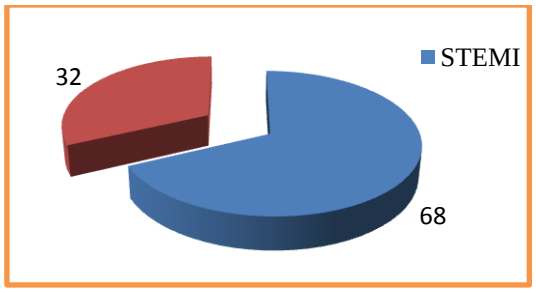

Figure 1. Classification of AMI

Patients with abnormal lipid values:

In the study lipid abnormalities were as follows.

Table 1: Abnormal Lipid Parameters

Abnormal Lipid Parameters	No of patients
TC ≥ 150	50
TGL ≥ 150	36
LDL ≥ 100	29
HDL ≥ 40	37

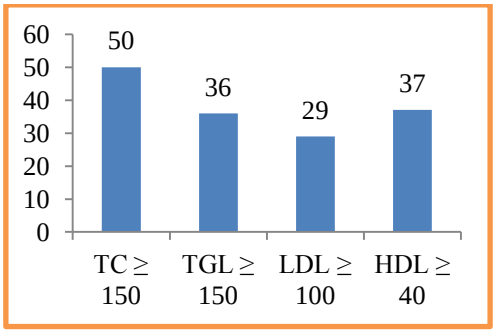

Figure 2. Abnormal Lipid Parameters

Table 2: LDLc / HDLc ratio

LDLc / HDLc	No of patients
≥ 3	17
< 3	83

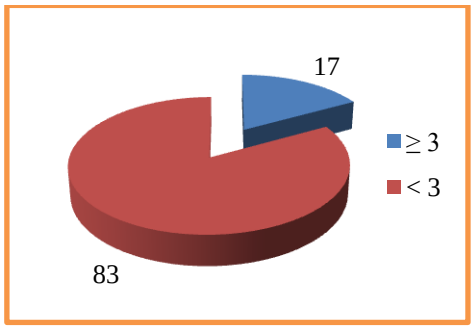

Figure 3. LDLc / HDLc ratio

Complications of MI:

Left ventricular failure was the most common complication seen in 36(36%) patients, followed by Cardiogenic shock 9(9%), Atrioventricular block 4(4%). Out of 100 patients, 4(4%) patients had Ventricular Tachycardia. Thus 56(56%) patients suffered from complications whereas 44(44%) patients did not have any complications.

Table 3: Complications of MI

Complications	No. of Patients	Percent
Left Ventricular Failure	36	36
Cardiogenic shock	9	9
Atrioventricular Block	4	4
Bundle Branch Block	3	3
VT	4	4
Total	56	56

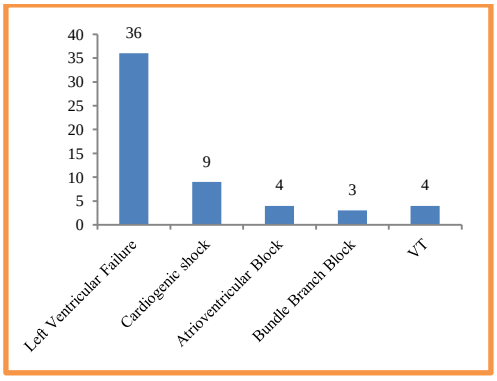

Figure 4: Complications of MI

LDLc / HDLc Ratio and Complications:

In the study patients with Acute myocardial infarction who had elevated LDLc / HDLc Ratio ≥ 3 at the time of admission and those who developed acute complications were observed and following result were obtained.

Table 4: Association of LDLc / HDLc Ratio Vs Complications

LDLc / HDLc Ratio	Complications				Total
	With Complications		Without Complications		
	N	%	N	%	
LDLc / HDLc Ratio < 3	46	55.4	37	44.6	83(100)
LDLc / HDLc Ratio ≥ 3	10	58.8	7	41.2	17(100)
Total	56		44		

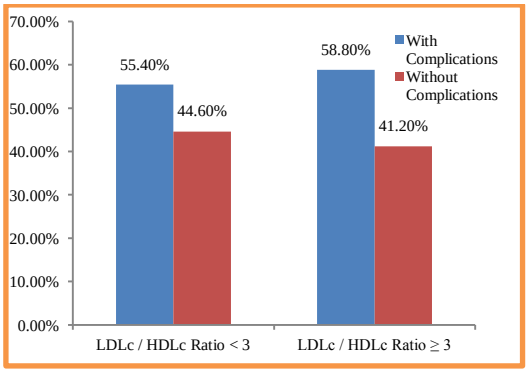

Figure 5: Association of LDLc / HDLc Ratio Vs Complications

CHI-SQUARE TEST

	Value	'P' value
Chi – Square test	.066	.797

About 55.4% patients with LLC\DLC ratio <3 are associated with complications where as 44.6% of patients having LDLC\HDLC ratio of <3 are without any associated complication following MI About 58.8% of patients whose LDLC\HDLC ratio is greater than or equal to 3 have associated with complications following MI where as 41.2% of patients with LDLC\HDLC ratio ≥ 3 have not associated with complications the chi-square test of association is insignificant (x2 =.066, P=.797) therefore DLC\HDLC ratio not significantly inflvenving the complications following MI.

DISCUSSION

In our study 50 patients had increased TC, 36 had increased TG and 37 had decresed HDL. Most common lipid abnormalities were high TC and low HDL levels. In Foussas et al[34] study 64.6% of patients had lipid abnormalities. And in Mohmoud Suleiman et al[35] study 41% of patients had dyslipidemias. LDL/HDL ratio was taken in all patients. Among 100 patients LDL/HDL ratio was ≥ 3 in 17 patients and ≤ 3 in 83 patients. So the ratio is not significant (p<0.01) with the incidence of myocardial infarction.

CONCLUSION

- This study shows that LDLc/HDLc ratio was observed in only less no of patients.
- No significant correlation was found between the LDLc/HDLc ratio and the incidence of complications in acute myocardial infarction.
- The study concludes that LDLc/HDLc ratio does not serves as an significant prognostic marker for monitoring the complications of acute myocardial infarction.

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