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Emerging Significance of Measuring Non HDL - Cholesterol in CAD

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Abstract
Coronary Artery Disease burden is alarmingly high and is a purpose of challenge. There are many correctable danger factors for CAD. Of these dyslipidemia has the highest danger for myocardial infarction. Of all the lipoproteins, LDL plays a relevant role in CAD. Reduction of LDL-C results in widespread decrease in CAD incidence. However, there are several other atherogenic lipoproteins in the blood like LDL cholesterol-enriched remnants of TG – rich lipoproteins, VLDL, IDL and LDL which accounts for 25%. These are the NON-HDL - C leading to increase in CAD incidence. This study emphasis the importance of non HDL-C in predicting CAD.
Key Words: *Coronary Artery Disease (CAD), NON-HDL-Cholesterol.*

Introduction

Coronary Artery Disease (CAD) results in more deaths, disability and economic constrains than other illness even in the advanced countries(1). CAD is the leading cause of mortality and morbidity even in growing nations, like India. Various risk factors had been illustrated as the predisposing factors along with smoking, alcohol, weight problems, hypertension, diabetes mellitus, and dyslipidemia. Atherosclerosis is the primary cause of CAD (7). Atherosclerotic plaque formation and pathological vascular remodelling therefore cause impaired tissue perfusion and ischemia.

Low density lipoprotein cholesterol (LDL-C) is constantly regarded as a key component for atherosclerosis and a primary goal of lipid reducing therapy for cardiovascular illnesses(2). Recently, it has been studied that non HDL cholesterol has a more benefit over LDL cholesterol in predicting coronary artery disease. Our study pursuits to become aware of non High Density Lipoprotein Cholesterol (non-HDL-C) as a threat predictor for atherosclerosis. Non HDL-C is the sum of cholesterol accumulated in all lipoproteins except HDL, along with chylomicrons, VLDL, and their remnants IDL (Intermediate Density Lipoproteins), LDL (Low Density Lipoproteins), LP (Lipoprotein)(3). Non HDL - C calculated by using this formula Non HDL-C (mg/dl) = TC – HDL-C.

It was found that increased levels of non HDL-C via 1 mg/dl will increase the threat of loss of life because of cardiovascular risk through 5% and seems to be a better predictive indicator than the conventional lipid risk factors[4]. Low density lipoprotein cholesterol (LDL-C), for decades has been considered and a marker for coronary artery

disease. But many persons with normal LDL-C are determined to be stricken by CAD [6]. This shows that LDL-C, triglycerides and other cholesterols besides HDL-C should be taken into consideration whilst predicting CAD. Thus these days non HDL-C is gaining extra importance as predictor of CAD.

Materials and Methods

This is a prospective study consisting of 100 patients which includes equal numbers of study and control. Study group consists of patients recognized with Coronary Artery Disease based on ECG, ECHO, and cardiac enzymes. Control group includes patients without CAD who attended master health check in RMMCH. The aim of this study was to assess the lipid profile in patients with established coronary artery disease and to evaluate the patients with and without CAD, to predict morbidity in cardiovascular disease with NON-HDL cholesterol levels. Age >18 yrs of both sexes, coronary artery disorder recognized based on ECG, ECHO, and Cardiac enzymes had been included. Age< 18 yrs, patients on lipid reducing drugs, chronic liver diseases, thyroid disorder, renal disease were excluded.

Results

In a total of a 100 patients in the study, men constituted approximately 54% and females 46% (Table 1). Majority of CAD patients had been among 56 – 65 years (Table 1). On contrast of risk factors like diabetes, hypertension, smoking and alcohol consumption, it turned into discovered that 42 patients had been diabetic, 22 have been hypertensive, 28 have been people who smoke, 19 had been alcoholic. Majority of the patients have been diabetic (Table 2).

Figure 1: Gender Wise Distribution

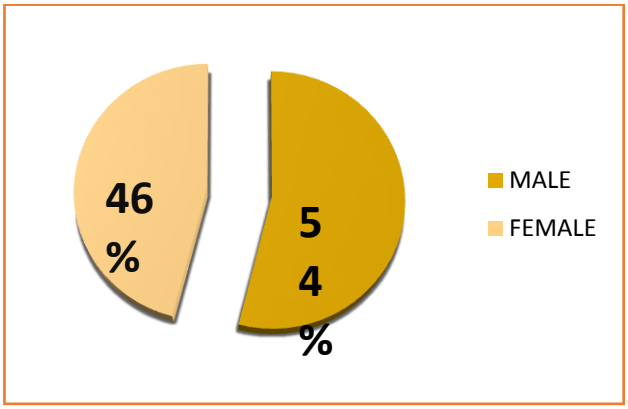

Table 1: Age Wise Distribution

Age in years	Cases	Control	Percentage
35-45	4	6	10%
46-55	12	13	25%
56-65	13	17	30%
66-75	11	10	21%
76-85	10	4	14%
TOTAL	50	50	

Table 2: Risk Factor Distribution

Risk factors	Cases	Control	total
Diabetic	20	22	42
Hypertensive	11	11	22
Smokers	18	10	28
Alcoholic	10	9	19

Table 3: Lipid Parameters

	levels(mg/dl)	cases	control
	<100	26	15
	101-130	4	25
LDL-C	131-160	17	8
	>160	3	2
NON-HDL-C	<130	11	31
	131-160	16	13
	161-190	7	4
	>190	16	2
TGL	<150	26	29
	>150	24	21

Table 4 : Statistical Analysis of Lipid Parameters

	CASES	CONTROL	P VALUE
AGE	63.42±11.5	59.7±11.01	0.104
TCL	216.20±52.6	166.34±30.96	<0.001
LDL	110.02±35.7	113.76±20.2	0.522
HDL	42.38±4.75	43.96±5.09	0.112
NON-HDL	163.94±50.8	122.38±33.9	<0.001
TGL	143.68±26	156.44±58.8	0.191

Though LDL-C is constantly taken into consideration as key thing in cardiovascular disease, in our group lipid parameter analysis

ordinary LDL-C Levels <100 mg/dl was seen in 26 out of 50 patients with CAD. NON-HDL-C levels >130mg/dl was seen in 39 out of 50 with CAD. Low LDL-C is related to decrease CAD occurrence. But our study challenges this conditional principle, as 26 out of fifty patients in study group with CAD had LDL-C <100 mg/dl.

Discussion

This study was done on 100 patients with 50 cases (with CAD) and 50 control (without CAD). Older individual are more likely to have CAD. Male gender commonly had CAD. Majority of patients with CAD had risk factors like diabetes. The mean Total cholesterol, Non-HDL-C all were significantly increased.

Less than half of the patients had triglycerides levels elevated more than >150 mg/dl. The Lipid Research Clinics Program Follow Up study reveals that use of NON-HDL-C attention in CAD risk prediction even in population having triglycerides <200 mg/dl.[8].

Ruminska et al. Evaluated the usefulness of non-HDL-C in the lipid disorders. Patients with elevated non-HDL-C (> 123 mg /dl) had extensively better values of waist circumference and serum TC, LDL-C, TG, TC: HDL-C, TG: HDL-C and lower HDL- C[9].

Non-HDL-C level became related CAD hazard even at the rate of normal LDL-C . Treatment intention for NON-HDL-C is 30 mg/dl above the LDL-C remedy goal [5].

In the EPIC-Norfolk prospective population observe, individuals with high non-HDL-C levels were at multiplied CAD hazard independently of LDL-C values[10].

Few studies have proved the predictive value of non-HDL-C and its superiority over LDL-C in causing cardiovascular disease.[11-12] A study by Arsenault et al states that non-HDL-C should nevertheless predicts CAD even at low LDL-C degrees[13]. Another study postulates that NON-HDL-C turned into proposed to be a very good predictor independent of LDL-C levels in initial CAD.[14].

Conclusion

Our study concludes that Non-HDL-C ranks over LDL-C, besides having other benefits like inclusion of all apolipoprotien B, valid postprandial degrees, no extra cost for checking out, evaluation desirable in patients with elevated triglycerides ranges.

Non-HDL-C considered secondary goal of therapy after attaining target LDL. Laboratories ought to encourage reporting NON-HDL-C and clinicians ought to consider it for further decision in management.

References

1. Katarzyna Bergmann: non HDL cholesterol and evaluation of cardiova-scular risk eJIFCC. 2010;21 (3):181-4 .
2. Expert panel on detection, Evaluation and Treatment of high blood cholesterol in adults (ADULT TREATMENT PANEL III) JAMA. 2001; 285 (19):2486-97 .
3. Bittner V. Non HDL-C measurement, interpretation and significance. Adv. Stud Med 2007:7(1):8-11.
4. Liu J, Sempos C, Donacue RP. Joint distribution of non HDL and LDL cholesterol and coronary heart disease risk prediction among individuals with and with diabetes. Diab care. 2005; 28(8):1916-21.
5. National Cholesterol Education Program (NCEP) Expert panel on Detection, Evaluation and Treatment of High Blood Cholesterol In Adults final report circulation 2002, 106 :3143-3421.
6. Arsenault BJ,Boekholdt SM, Kastelein JJ (2011) Lipid parameters for measuring risk of cardiovascular disease. Nat Rev Cardiol 8: 197-206.
7. Pasterkamp C, Falk E (2000) Atherosclerotic plaque rupture: an overview. J Clin Bas Cardiol 3:81-86.
8. Cui Y, Blumenthal RS, Flaws JA, Whiteman MK, Langenberg P, et al (2001) Non high density lipoprotein cholesterol

level as a predictor of cardiovascular disease mortality. Arch Intern Med 161:1413-1419.

9. Ruminska M, Czerwonogrodzka A, Pyrzak B, et al evaluation of non-hdl-c in children and adolescents with abdominal obesity ped pol 2010,1.
10. EPIC Norfolk prospective study on Role of NON-HDL cholesterol stratification for coronary artery disease Jamal.S. Rana,S Matthijs Borkholdt (2012) Vol 130-134.
11. John J.P. Kastelein, Wim A. Van der steeg, Ingarholme, Michael Gaffney, Nilo BC, Philip Barter, *et al*. Lipids, Apo lipoproteins and their ratios in relation to cardiovascular events with statin treatment. Circulation. 2008; 117(2): 3002-9.
12. Jain Liu, Christopher Sempos, Richard P,Donahue, Joan Dorn, Maurizio Trevisan, Scott M, Grundy: Joint distribution of Non-HDL lipoprotein and coronary artery disease risk prediction among individuals with and without diabetes. Diabetes care 2005;28(8):1961-21.
13. Arsenault BJ, Rana JS, Stroes ES, Després JP, Shah PK, Kastelein JJ, *et al*. Beyond low-density lipoprotein cholesterol: respective contributions of Non- HDL-Cholesterol levels, triglycerides, and the total cholesterol/high density lipoprotein cholesterol ratio to coronary heart disease risk in apparently healthy men and women. J Am Coll Cardiol. 2009; 55(1):35-41.
14. Jain Liu, Christopher Sempos, Richard PD, Joan Dorn, Maurizio Trevisan, Scott MG. Non-HDL Lipoprotein and VLDL cholesterol and their risk predictive values in coronary heart disease. Am J Cardiol. 2006; 98(10):1363-8.