

EFFECT OF CORONARY ARTERY DISEASE DURATION ON; PLASMA LIPIDS & LIPOPROTEINS CONCENTRATION

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ABSTRACT

Present study evaluated a new factor i.e. effect of coronary artery disease (CAD) duration on plasma lipids and lipoproteins concentration. 105 patients of atherosclerotic CAD were divided as: group-A (n=59) having CAD duration 1 year, group-B (n=25) and group-C (n=21) having CAD duration 3 years. In group-A, 79% patients had positive history of vegetable oil use, group-B, 68% and in group-C, 61% patients have positive history of vegetable oil use in their diet after onset of CAD symptomatology. Results showed that total cholesterol (TC), LDL and LDL-C which were significantly raised in group-A and B, become non-significantly raised levels in group-C when each group compared with control subject (n=35) while except significantly decreased levels ($p < 0.02$) of HDL₂-C in group-B, all other parameters (TC, triglycerides, LDL, LDL-C, VLDL-C, THDL-C and HDL-C) showed non-significant difference when compared with group-A. Non-significant difference in levels also seen in group-C when compared with group-A. Study concluded that after 3 years of CAD duration TC, LDL and LDL-C levels were decreased. However, this effect may be depended upon vegetable oil use. While effect of CAD duration on HDL-C levels remained controversial.

KEY WORDS: MI-Myocardial infarction, CAD-Coronary artery disease, LDL-Low density lipoprotein, LDL-C LDL cholesterol, T-HDL-C Total high density, Lipoprotein cholesterol, HDL₂-HDL₃ Sub fractions of HDL, VLDL-Very low density lipoprotein.

INTRODUCTION

Coronary artery disease (CAD) is a condition of diverse etiology, all having in common disturbance between oxygen supply and demand¹. The most common cause of ischemia is atherosclerotic disease of epicardial coronary arteries². In CAD

patients Lewis et al³ found raised triglyceride and cholesterol concentration in VLDL, which were the most frequent at normalities followed by raised cholesterol content of LDL. Elevated plasma LDL have been associated with accelerated atherogenesis⁴. Both T-HDL-C and HDL-C levels

have inverse association with risk of acute myocardial infarction (MI), whereas role of HDL₃-C remained equivocal⁵. Serum triglycerides give wider discrimination than total cholesterol in identifying not only patients with multivessel disease but also those with important single vessel disease⁶.

Atherosclerotic process begins years before the onset of CAD symptomatology and usually during acute attack of CAD, levels of plasma lipids and lipoproteins are affected¹. Present study was designed to observe the independent effect of CAD duration on plasma lipids and lipoproteins, after onset of CAD symptomatology.

METHODS

Data of 105 male patients of atherosclerotic CAD admitted for coronary angiography at N.I.C.V.D Karachi during September 1991 to February 1992 and 35 apparently healthy male control subject was reviewed.

All patients were non-diabetic, non-hypertensive and having no hepato-renal disease. Patient having recent MI (less than 12 weeks) and those taking lipid affecting drugs were not included in this study. Control subjects were of the same age and socioeconomic class as CAD patients. Blood samples were estimated for total serum cholesterol,

triglyceride, LDL and VLDL⁷ THDL-C and HDL₃-C. While LDL-C, VLDL-C and HDL₂-C were calculated by formula. All patients were divided into three groups. Group-A having 1 year CAD duration, Group-B, 2 years and Group-C having 3 years CAD duration.

RESULTS

Group-A included 59 male CAD patients (age, 45.98 ±1.07 years), group-B having 25 patients (age, 51.28 ±1.77 years) and in group-C, 21 patients (age 53.85 ±1.86 years) were included. Mean age of 35 control subject was 49.34 ±1.94 years. In group-A 79%, group-B 68% and in group-C, 61% patients had positive history of vegetable oil use in their diet after onset of CAD. While none of the control subjects uses vegetable oil in their diet.

Table-1 shows comparison of serum values of lipids and lipoproteins among patient's group and with control subjects. In group-A and B all lipids and lipoproteins parameters in study were significantly different when compared with controls, while except TC, LDL and LDL-C all other lipids and lipoproteins levels were significantly different in group-A and B, when compared with control subjects. In comparison among all patients groups, only HDL₂-C level in group-B was significantly decreased (p<0.02) when compared with group-A.

	Control (n=30)	Group A (n=59)	Group B (n=25)	Group C (n=21)
Total serum cholesterol	196.57±3.64	219.81±7.44***	220.44±9.73*	208.71±2.73
Triglyceride	127.57±5.15	184.66±9.85***	195.28±14.78****	203.04±7.40****
LDL	120.11±3.59	157.77±8.28***	156.32±10.73	144.90±14.87
LDL-C	117.11±3.40	149.93±8.26****	147.60±9.20****	133.95±14.21
VLDL	54.02±4.22	1.05.28±7.00***	125.76±13.09	123.95±13.87****

VLDL-C	25.11±1.03	36.27±1.87***	39.88±2.96****	43.76±3.72****
THDL-C	53.88±1.24	33.23±0.71***	32.36±1.00****	32.04±1.07****
HDL3-C	28.85±1.18	23.76±0.56****	24.44±0.92***	23.23±0.74***
HDL2-C	24.74±0.72	9.97±0.53****	7.92±0.50****	8.80±1.10****
*P <0.05, **P<0.02, ***P<0.01, ****P<0.001, X=Group-B v/s Group-A				

DISCUSSION

In this study total serum cholesterol, LDL and LDL-C levels were affected by 3 years duration of CAD. These levels which were significantly raised in group-A and B showed nonsignificant difference when compared each group with control subjects. Similar observations were found in our one previous study⁹ and other studies^{10,11}, in which these levels were significantly decreased in patients using vegetable oil. Initially it was thought that these effects (in this study) after 3 years of CAD duration may be due to vegetable oil use. However, when history of vegetable oil use was reviewed it was found that in all patient groups majority were using vegetable oil, greater number of such patients were in group-A (79%) rather than group-C (61%). Considering these observations study concluded that vegetable oil use may not affect these lipids and lipoprotein independently rather CAD duration is also important.

On the other side significantly decrease ($p < 0.02$) levels of HDL₂-C in group-B give more complex picture. If duration of CAD was the factor for this decrease then no more work after 3 years (group-C). This indicates that effect of CAD duration on HDL-C was not independent. However, which other factor or mechanism involve in this, decreases of the HDL₂-C in group-B while not in group-A or C. Other studies^{12,13} also reported that effect of polyunsaturated fat on HDL-C is more controversial. Analysis of our data shows that significantly decrease level of HDL₂-C in group-B is neither independent effect of vegetable oil use

nor independent effect of CAD duration. Even if we consider dependent role of both factor, reason or mechanism for decrease of HDL₂-C in this study not reasonably explainable. Other factors may involve, which need to be explored. Finally study concluded that CAD duration after onset of CAD symptomatology may influence the levels of plasma lipids and lipoproteins. However, whether this influence is independent or dependent to other factors, yet to be determined.

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