

A Comparative Study of Lipid Profile In Hospitalized Patients

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Abstract

Dyslipidaemia is a major risk factor for the development of cardiovascular disease. Present study, was aimed to find out the lipid profile in hospitalized patients. The mean \pm SD (mg/dl) level of total cholesterol (TC), triglyceride (TG), low density lipoprotein (LDL) and high density lipoprotein (HDL) in hospitalized patients were 183.02 ± 49.76 , 165.04 ± 81.2 , 113.16 ± 41.25 and 36.46 ± 9.14 , respectively. The higher LDL level was found in 18% of patients while 14% patients were at borderline. The higher TG level was found in 14% of patients while 26% patients were at borderline. Higher HDL level (>40 mg/dl) was found in 34% of the total hospitalized patients. Present study showed the desirable TC level in 66%, normal TG in 46% and normal LDL (<129 mg/dl) in 68% of hospitalized patients. Mean TC, TG, LDL and HDL levels showed increasing trend with age. Extremely significant correlation was found in total cholesterol where as significant correlation was found in TG while no significant correlation was found in HDL and LDL in 21-40 yr age group in total hospitalized patients. Highly significant correlation was found in total cholesterol where as extremely significant correlation was found in HDL while no significant correlation was found in TG and LDL in 41-60 yr age group in total hospitalized patients. We conclude that lipid profile estimation should be done in all hospitalized patients as early as possible, irrespective of etiology, so that better management is possible for these patients.

Introduction

The largest proportion of non communicable diseases (NCDs) deaths is caused by cardiovascular disease (48%), followed by cancers (21%) and chronic respiratory diseases (12%).(1) It is projected that the annual number of deaths due to cardiovascular disease will increase from 17 million in 2008 to 25 million in 2030. (2) Worldwide, there is a wide variation in mean population cholesterol levels. Increased serum total cholesterol (TC), triglyceride (TG), low density lipoprotein (LDL) level and decreased high density lipoprotein (HDL) are associated major risk factors for cardiovascular disease (CVD). High cholesterol levels are estimated to cause 56 percent of global ischemic heart disease.(3) Diagnosis of

hyperlipidemia in hospitalized patients confers potential benefit in terms of initiation of treatment. The study of lipid profile is of primary importance due to its role in development of atherosclerosis. Approximately 10% of the global population is affected by dyslipidemia. In the developed countries (USA, Europe and Japan) there are more than 240 million people with abnormal lipoprotein levels. It is estimated that by 2020, CVD will be the largest cause of disability and death in India.(4) Serum levels of lipids and lipoprotein lipids have proven to be the most potent and best substantiated risk factors for atherosclerosis in general and coronary heart disease in

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particular.(5-8) Present study, was aimed to find out the prevalence and distribution of lipid profile in hospitalized patients.

Material and Methods

For the present study 50 control subjects and 50 hospitalized patients of different wards of civil hospital, Ahmedabad had been selected. All the subjects were advised to attend fasting at least for 12 hours prior to the blood sampling. Only the adults aged >21 years were included in the study. The lipid measurements were performed in the Hi-Tech Biochemistry laboratory, BJ Medical College, Ahmedabad. Non fasting subjects were excluded in the study. TC, TG, LDL and HDL cholesterol were estimated by using commercially available enzymatic colorimetric test following the protocol and instructions of the manufacturer.

Lipids levels were classified according to the classification recommended by National Cholesterol Education Program (NCEP) and Adult Treatment Panel III (ATP III) guidelines.(9,10) Desirable level of TC was <200 mg/dl, borderline high was between 200-239 mg/dl and high TC was considered when the level was > 240 mg/dl. Similarly optimal level of LDL was defined when it was <100 mg/dl, near optimal level was between 100-129 mg/dl, borderline high was between 130-159 mg/dl, the level was considered high when it was between 160-189 mg/dl. When LDL level was >190 mg/dl then it was defined very high, according to the guideline. Similarly TG level was considered normal when it was <150 mg/dl, borderline high TG was between 150-199 mg/dl, between 200-499 mg/dl was considered high TG and very high TG was defined when it was >500 mg/dl. Desirable HDL was considered when it was >40 mg/dl. Percentage distribution of the total study group was calculated according to the lipid profile classification.

Statistical Analysis

Statistical significance (student's t- test) was applied to analyse the difference of lipid levels among above

mentioned different age groups. The cut off value of $p < 0.05$ was considered for the statistical significance. The Pearson correlation coefficient test was used for assessment of correlation between lipid profile and age in studied group.

Results

Present study was aimed to find out the lipid profile of hospitalized patients (n = 50; M: 28 and F: 22; Mean age: 42.42 ± 8.9 years). The mean \pm SD (mg/dl) level of total cholesterol (TC), triglyceride (TG), low density lipoprotein (LDL) and high density lipoprotein (HDL) in hospitalized patients were 183.02 ± 49.76 , 165.04 ± 81.2 , 113.16 ± 41.25 and 36.46 ± 9.14 , respectively. The mean \pm SD (mg/dl) level of total cholesterol (TC), triglyceride (TG), low density lipoprotein (LDL) and high density lipoprotein (HDL) in control subjects were 157.38 ± 19.58 , 131.72 ± 22.59 , 108.90 ± 15.78 and 44.84 ± 8.33 , respectively. Mean TC, TG, LDL and HDL levels showed increasing trend with age. The statistically significant difference was observed in LDL in the age group of 41-60 years when compared with younger age group while statistically no significant difference was observed in TC, TG and HDL when compared with younger and older age group. In age groups of 21 - 40 years and 41 - 60 years, the mean values were 150.48 ± 30.28 mg/dl, 209.33 ± 48.74 mg/dl for TC; 149.43 ± 70.16 mg/dl, 194.89 ± 85.98 mg/dl for TG; and 32.17 ± 6.71 mg/dl, 39.70 ± 9.24 mg/dl for HDL-C 92.17 ± 38.57 mg/dl, 128.78 ± 36.86 mg/dl for LDL-C.

The normal TC was found in 66% of the hospitalized patients while 8% had high TC. Higher percentage of females than males had borderline TC. Higher level of TC was observed among males (9.10%) than in females (7.14%).

The normal TG level was found in 46% of patients. Higher percentage of males than females had borderline TG. Higher level of TG was observed among males (31.82%) than in females (25%). The normal LDL level was found in 68% of patients. Higher level of LDL was

Table. 1 Statistical analysis of Lipid Profile of subjects (Control v/s Patients) studied in 21-40 Yr. age groups

't' value in 21- 40 Yr. Age	Male	Female	Total
Group Lipid Profile			
Total Cholesterol	0.9496	0.8288	1.196
Triglyceride	1.137	1.173	1.286
HDL	3.083**	5.744**	5.24**
LDL	0.7907	2.78	2.117*

* $p < 0.05$, ** $p < 0.005$

Table-2 Statistical analysis of Lipid Profile of Subjects (Control v/s Patients) Studied in 41-60 Yr. Age Groups

't' value in 41- 60 Yr. Age Group	Male	Female	Total
Lipid Profile			
Total Cholesterol	4.065**	3.281**	5.110**
Triglyceride	1.073	4.078**	3.411**
HDL	2.401*	0.7279	2.357*
LDL	3.191**	0.5316	2.505*

* $p < 0.05$, ** $p < 0.005$

Table-3 Correlation coefficient (r) between Age Group (21-40 Yr.) and Lipid Profile parameters in hospitalized patients

'r' value in 21- 40 Yr. Age Group	Male	Female	Total
Lipid Profile			
Total Cholesterol (TC)	0.8324**	0.8692**	0.8380**
Triglyceride(TG)	0.4715	0.09723	0.4378*
HDL	0.01013	0.7238*	0.3426
LDL	0.2866	0.5361	0.3859

* $p < 0.05$, ** $p < 0.005$

Table-4 Correlation coefficient (r) between Age Group (41-60 Yr.) and Lipid Profile parameters

'r' value in 41- 60 Yr. Age Group	Male	Female	Total
Lipid Profile			
Total Cholesterol (TC)	0.5899*	0.5512*	0.5489**
Triglyceride(TG)	-0.3208	-0.1036	-0.2392
HDL	-0.3317	0.2523	-0.03739
LDL	0.6740*	0.6221*	0.6268**

* $p < 0.05$, ** $p < 0.005$

observed among males (22.73%) than in females (14.28%). Higher HDL level ($>40\text{mg/dl}$) was found in 34% of hospitalized patients which were comparable with previous report. 11 Higher percentage of males (35.72%) than females (31.82%) had HDL level above 40mg/dl .

Statistically very significant "p" value observed in both

male and female in studied group in HDL-C, while significant "p" value observed in total studied group in LDL-C (Table-1).

Statistically extremely significant "p" value observed in TC, while very significant "p" value observed in TG and significant "p" value observed in HDL-C and LDL-

C in total studied group in 41-60 years age group (Table-2).

Very significant correlation was found in total cholesterol where as significant correlation was found in TG while no significant correlation was found in HDL and LDL in 21-40 years age group in total hospitalized patients (Table-3).

Highly significant correlation was found in total cholesterol where as extremely significant correlation was found in LDL while no significant correlation was found in TG and HDL in 41-60 years age group in total hospitalized patients (Table-4).

Discussion

Association of lipid profiles is reported with age and lifestyle. (11, 12) The increase in mean Cholesterol, triglyceride and low density lipoprotein level can be due to the changing life style of the people during recent years associated with rapid and unplanned urbanization and also globalization. (13,14) Steady increase of cholesterol levels has also been reported in other Asian countries during the last decade of the 20th century. (15) This study mainly limits with the unavailable data of hypertension, family history and obesity of the individuals who were enrolled in the study, because these parameters are positively correlated with dyslipidemia.

Conclusion

We conclude that lipid profile estimation should be done in all hospitalized patients as early as possible, irrespective of etiology, so that better management is possible for these patients. Dietary education of hospitalized patients and inclusion of exercise programmes at health centres will likely to improve CVD mortality in hospitalized patients.

ACKNOWLEDGEMENTS

We are thankful to all the staff members of Hi-Tech Laboratory, B. J. Medical College, Civil Hospital, Ahmedabad, for their support and cooperation.

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