Lipid Profile in a Tertiary Care Center

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ABSTRACT

Introduction: Lipid profile is changing with changing developmental status and lifestyle in less developed countries and coronary artery disease risk factor is rising. The aim of the study is to find the lipid pattern in Department of Medicine in tertiary care hospital.

Methods: An observational prospective study was conducted in 408 subjects from January 2009 to February 2010. Study subjects were selected irrespective of co-morbid condition and coronary risk factors.

Results: The mean Triglycerides, Cholesterol, LDL, HDL were 138.3±78.3 mg/dl, 180.2±53.7 mg/dl, 113.8±41.2 mg/dl, 40.1±10.1 mg/dl respectively. The Triglycerides (>140 mg/dl), Cholesterol (>250 mg/dl), LDL (>92 mg/dl), HDL (<45mg/dl) were 35.5%, 7.6%, 67.9%, 76% respectively.

Conclusions: Lipid profile is becoming atherogenic with high triglyceride, high LDL and low HDL being the most common abnormality. An epidemiological study is recommended to understand the true burden of the disease in the community.

Key Words: *atherogenic, cholesterol, coronary artery disease, lipid profile, triglyceride*

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INTRODUCTION

In Western countries, it has been shown that coronary heart disease (CHD) is related to high serum total cholesterol (TC) levels.[1] In less developed continents such as Asia and Africa, serum lipid levels are low and CHD incidence is much lower as compared with Western countries.[1] With growing urbanization and industrialization in Asia, it has been shown that there is a concomitant rise in the level of serum TC and with it a rise in CHD. [1,2] Similar pattern of rise has also been observed in Southeast Asian region with a slow progress towards the suburban and rural area.[2-4] Studies correlating with coronary risk factor and lipid profile in our setup are few with some study suggesting high total cholesterol and LDL as the common abnormality and some correlating with adverse cardiac outcome.[5-9] The objective of the study is finding the lipid pattern in Kathmandu University Teaching Hospital.

METHODS

A prospective observational study was carried out in Dhulikhel Hospital, Kavrepalanchowk district from January 2009 to March 2009. Ethical approval was taken from the hospital. The study subjects were taken based on convenient sampling method. All the study subjects in the Outpatient Department irrespective of their comorbid condition and risk factor predisposing to coronary artery disease were included in the study. Study subject who were terminally ill and admitted as inpatients were excluded. The lipid profile classification based on different level was classified as per the hospital guidelines. Data analysis were done using Microsoft excel 2007 and SPSS 11.9 Version.

Total of 408 cases were taken and their lipid profile studied. Majority of subject fell within 45-60 years (35%) age group followed by 30-45 (25%) years. Male to Female ratio was 1.87:1.00 (Table1).

Table 1. Age and sex structure of the patients

Age	Male (%)	Female (%)	Total (%)
≤ 15	7 (2.6)	-	7 (1.7)
15-30	26 (9.8)	18 (12.7)	44 (10.8)
30-45	65 (24.4)	37 (26.1)	102 (25.0)
45-60	96 (36.1)	48 (33.8)	144 (35.3)
60-75	60 (22.6)	34 (23.9)	94 (23.0)
³75	12 (4.5)	5 (3.5)	17 (4.2)
Total	266 (100)	142 (100)	408 (100)

Table 2. HDL level for males and females

HDL level	Male (%)	Female (%)	Total (%)
Below 45 mg/dl	203 (76.3)	107 (75.4)	310 (76.0)
45-55 mg/dl	48 (18.0)	25 (17.6)	73 (17.9)
55 mg/dl and above	15 (5.6)	10 (7.0)	25 (6.1)
Total	266(100.0)	142 (100.0)	408 (100.0)

HDL level for male and female (below 45 mg/dl) was recorded to be 203 (76.3%) and 310 (75.4%) respectively. Overall, 310 (76%) were below 45 mg/dl (Table 2).

Table 3. LDL level for males and females

LDL level	Male (%)	Female (%)	Total (%)
≤92	86 (32.3)	45 (31.7)	131 (32.1)
92-150	137 (51.5)	81 (57.0)	218 (53.4)
³150	43 (16.2)	16 (11.3)	59 (14.5)
Total	266 (100.0)	142 (100.0)	408 (100.0)

LDL level above 150 mg/dl were 59 (14.5%), and 218 (53.4%) were between the ranges of 92-159 mg/dl (Table 3). Values were comparative for both male and female.

Table 4. Triglycerides(TG) levels for males and females

TG level	Male (%)	Female (%)	Total (%)
≤40mg/dl	3 (1.1)	1 (0.7)	4 (1.0)
40-140mg/dl	168 (63.2)	91 (64.1)	259 (63.5)
³140 mg/dl	95 (35.7)	50 (35.2)	145 (35.5)
Total	266 (100.0)	142 (100.0)	408 (100.0)

TG values above 140 mg/dl were found to be 145 (35.5%) and were comparative among male and female. Majority of people fell within 40-140 mg/dl (63.5%) (Table 4).

Table 5. Levels of Cholesterol by sex

Cholesterol level	Male (%)	Female (%)	Total (%)
≤150mg/dl	65 (24.4)	40 (28.2)	105 (25.7)
150-250 mg/dl	178 (66.9)	94 (66.2)	272 (66.7)
³250 mg/dl	23 (8.6)	8 (5.6)	31 (7.6)
Total	266 (100.0)	142 (100.0)	408 (100.0)

Majority have cholesterol within the range of 50-150 mg/dl (66.7%). Cholesterol values among male and female were comparative (Table 5).

Statistics	AGE	HDL (mg/dl)	LDL (mg/dl)	TG (mg/dl)	Cholesterol (mg/dl)
Mean	50.2	40.1	113.8	138.3	180.2
Std. Deviation	16.1	10.1	41.2	78.3	53.7
Minimum Value	1.0	1.0	32.0	10.0	24.0
Maximum Value	99.0	98.0	353.0	775.0	694.0
Total count (N)	408.0	408.0	408.0	408.0	408.0

Mean age of presentation was 50.2 ± 16.1 years of age. TG values were 138 ± 78.3mg/dl, LDL values were 113.8 ± 41.2mg/dl and HDL values were 40.1 ± 10.1mg/dl and cholesterol values were found to be 180 ± 53.7mg/dl (Table 6).

DISCUSSIONS

The study makes an effort to find the changing pattern of lipid profile and subsequent risk for developing coronary artery disease in our population. With growing population, changes in lifestyle and food habit especially in suburban and rural areas of the country, there is a potential threat of increasing risk factor for possible coronary artery disease. The study is conducted in Kathmandu University Teaching Hospital, located in Dhulikhel in Kavrepalanchowk district. The data although may not be as representative of the true rural population but shows the preponderance of a rural community. An epidemiological study with randomized population would have been more accurate, however we make an attempt to bring the changing pattern of coronary risk factor in the suburban population and hence the study is unique in itself.

The cholesterol level in our study is 272 (66.7%) within the range of 150 to 250 i.e. above optimal and borderline high with the mean cholesterol being at 180 ± 78.3 showing much variation. Similar study conducted in Kathmandu valley in 2004 showed 30.25% had cholesterol high at similar ranges with more male preponderance.[5] Another study done in National heart center in 2008 showed the cholesterol level to be $184 \pm 50.70.6$A study done in India with lower socioeconomic strata showed the cholesterol level to be 37.4% in men and 43.1% in women.9 Another study done in Rajasthan India, urban as compared to rural men the prevalence of hypercholesterolemia >200 mg/dl (28% vs. 22%).[10] Other rural India studies, showed the mean value of 220 mg/dl.[11] The values in the study although shows high percentage is interpreted at the ranges of 150-250 mg/dl and can be compared to other studies. This only shows that there is definite rise in cholesterol level in rural setup as it was present in the urban areas three or four years back.

LDL level above 150 mg/dl were 59 (14.5%), and 218 (53.4%) were between the ranges of 92-159 mg/dl with a mean value 113 ± 41.2 mg/dl. Values were comparative for both male and female. In contrast, Kathmandu study showed above 160 mg/dl as 5% with mean of 84.97 mg/dl.[5]National heart center showed mean of 111.9 ± 42.0 with >190 found in 5.8% of study subject.6 The values are slightly higher as compared to the urban population hinting the possible increasing magnitude of high LDL.

HDL level for male and female (below 45 mg/dl) was recorded to be 203 (76.3%) and 310 (75.4%) respectively. Overall, 310 (76%) were below 45 mg/dl. The mean value in our study was 40.1 ± 10.1 mg/dl. Other studied in urban setup showed mean value to be 49.08 mg/dl5 and $45.0 \pm 11.70.6$ Similarly, values <40mg/dl were 23.30%5 and 40%6 were shown by the same studies. Although the ranges were different, one cannot rule out the decreasing HDL values.

In our study TG values above 140 mg/dl were found to be 145 (35.5%) and were comparative among male and female. Majority of people fell within 40-140 mg/dl (63.5%) with a mean value of 138.3 ± 53.7 mg/dl. A study in Kathmandu showed 31.5% had level >200mg/dl with a mean TG of 176.12mg/dl5 and National heart center study shows 147.4 ± 79.9 mg/dl with normal TG (<150 mg/dl) found in 61.5%.6 The values are fairly comparable supporting the evidence that triglyceride level are on rise in these population.

Adverse dietary, anthropometric and metabolic factors are predictors of early and accelerated atherosclerosis in rural population of this part of world which is rising.[12,13] Hypertension ,Smoking , abnormal lipid profile, obesity , glucose intolerance, genetic susceptibility and lack of physical activity has been cited as the possible reason for changing coronary risk factor in this part of world.[1,2,12-17]

Although, the study was unique on its way, it has its own limitation. Appropriate sampling and accurate sample size for a true epidemiological picture cannot be ruled out. Similarily, various comorbid conditions that play a role in changing the lipid profile are the other aspect to be considered. Hence, an epidemiological survey at a national level is recommended to get the true burden in urban, suburban and rural area of the country.

CONCLUSIONS

Lipid abnormalities are increasing in our population. High triglyceride, high LDL and low HDL are the most common abnormality. Atherogenic lipid profile among this population cannot be ruled out.

A national level epidemiological study is recommended for comparative analysis of changing lifestyle and lipid profile and its implication on coronary artery disease.

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