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Research Article

# A study to focus on the prevalence of hyperlipidemia in master health check- up patients at a multi specialty hospital

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**ABSTRACT**

Coronary heart disease is now becoming the major leading cause of mortality in India, and thus the study reveals the prevalence of hypercholesterolemia, Hypertriglyceridemia, increased levels of LDL-C and low levels of HDL-C, which are well known risk factors for cardiovascular diseases in all groups. The study was conducted for a period of six months- from November2009-April 2010. The study was carried out in Mediciti hospitals, under the master health check-up programme, a total of 397 patients were taken for the study. In this, 245 (62%) were males with the mean age of 49.59±12.81 tears and 152 females (38%) within the mean age of 49.13±10.60. Hyperlipidemia was more common in the age groups of 40-59 yrs for both. There were more males than females. This study concludes that there is a need for the prevention and control of Hyperlipidemia and a separate scoring system should be developed for the risk prediction towards coronary heart disease, for Indian population.

**Keywords:** Coronary heart disease; hypercholesterolemia; Hypertriglyceridemia; Hyperlipidemia

## INTRODUCTION

Hyperlipidemia is an elevation in atherogenic lipoprotein particles, including Cholesterol, cholesterol esters, and triglycerides. It also includes a low HDL-C level. (Erick. T. Herfindal 8th Edition)

**Basic description of lipids and lipoproteins (NCEP** ATPIII Sep 2002)

Cholesterol is a fat like substance (lipid) that is present in cell membranes and is a precursor of bile acids and steroid hormones. Cholesterol travels in the blood in distinct particles containing both lipids and proteins (lipoproteins). Therefore hyperlipidemia can also be called as hyperlipoproteinemias.

Three major classes of lipoproteins are found in the serum of a fasting individual: Low density lipoproteins (LDL), High density lipoproteins (HDL), and very low density lipoproteins (VLDL). Another lipoprotein class, Intermediate density lipoprotein (IDL) resides between VLDL and LDL. In clinical practice, IDL is included in the LDL measurement.

LDL cholesterol makes up 60-70 percent of the total serum cholesterol. It contains a single apolipoprotein, namely apo B-100 (apo B). LDL is the major atherogenic lipoprotein and has long been identified by NCEP as the primary target of cholesterol lowering therapy. HDL cholesterol normally makes up 20-30 percent of the total serum cholesterol. The major apolipoproteins of HDL are apo A-I and apo A-II. HDL cholesterol levels are inversely correlated with risk for CHD.

The VLDL is triglyceride-rich lipoproteins, but contain10–15 percent of the total serum cholesterol. The major apolipoproteins of VLDL are apo B-100, apo Cs (C-I, C-II, and C-III), and apo E. VLDL are produced by the liver and are precursors of LDL; some forms of VLDL, particularly VLDL remnants, appear to promote atherosclerosis, similar to LDL. VLDL remnants consist of partially degraded VLDL and are relatively enriched in cholesterol ester.

A fourth class of lipoproteins, chylomicrons, is also triglyceride-rich lipoproteins; they are formed in the intestine from dietary fat and appear in the blood after a fat-containing meal. The apolipoproteins of chylomicrons are the same as for VLDL except that apo B-48 is present instead of apo B-100.

Hyperlipidemia is an elevation in atherogenic lipoprotein particles, including Cholesterol, cholesterol esters, and triglycerides. It also includes a low HDL-C level. (Erick. T. Herfindal 8th Edition)

The aim study is to focus on the prevalence of hyperlipidemia in subjects who register for master health check-up programme.

## MATERIAL AND METHODS

The study population includes 397 patients of both the sexes with one or more abnormal lipid levels. The study was carried out in Mediciti hospital, under the

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master health check-up programme, which is 1500 bedded tertiary care multi-specialty teaching hospital Patient's data were collected from the medical database which included

Demographics (Age, Sex) Anthropometric measurements (Ht, Wt, & BMI), Social history (Smoking, Exercise & Diet), General information (Past history, Family history, Medication profile, BP), Clinical laboratory results (Lipid profile, Blood sugar).All analytical measurements were carried out in clinical laboratory department, using standard procedures.

Statistical analysis was carried out using Statistical software. (SPSS 15)

**RESULTS**

AGE AND SEX DISTRIBUTION: A total of 397 patients were taken for the study. In this, 245 (62%) were males with the mean age of 49.59±12.81 tears and 152 females (38%) within the mean age of 49.13±10.60. Hyperlipidemia was more common in the age groups of 40-59 yrs for both. There were more males than females.

FAMILY HISTORY: A family history of heart problem was seen in 62 (25.30%) males and 38(25%) of the female patients.

SMOKING: A total of 82(35.9%) male patients were smokers. None of the female patients were in this category.

EXERCISE: 54 (22.04%) male patients and 22 (14.47%) female patients were found to have Physical activity.

PAST HISTORY: 79 (32.2%) males and 53(34.9%) females were having the past history of either dyslipidemia, Blood pressure or Diabetes.

BODY MASS INDEX: The mean Body mass index was found to be 25.70±3.95 kg/m² for males and 27.56±for females, of which 102 (41.63%) males and 47(31%) of females were in the overweight category and 43(17.55%) males 53(34.86%) of females were found to be obese.

TOTAL CHOLESTEROL VS GENDER: 123(5.20%) males and 82(54%) were in the desirable range, 92 (37.5%) and 50 (32.9%) were in the borderline high, and 30(12.24%) and 20(13.15%) were having the high Total cholesterol levels.

TRIGLYCERIDES VS GENDER: 50 (20.4%) males and 32(21.1%) females were having the high triglycerides and 3(1.2%) males were having the very high level of Triglycerides.

HDL-C VS GENDER: 52(21.2%) males and 20(13.15%) females were in the low range.

LDL-C VS GENDER: 47 (19.1%) males and 21 (13.8%) females were having the high levels and 7 (2.85%) males and 7(4.60%) of females were having the very high levels of LDL-C.

SYSTOLIC BLOOD PRESSURE**:** 88 (35.91%) males and 39(25.65%) females were in the Stage I HTN. 46 (18.78%) males and 33(21.71%) females were in the Stage II HTN.

DIASTOLIC BLOOD PRESSURE: 71 (29%) males and 36(23.7%) females were having the Stage I HTN. 77(31.42%) males and 30(19.73%) females were having the Stage II HTN.

FASTING BLOOD SUGAR: 45(18.37%) males and 20(13.16%) females were having the increased levels of fasting blood sugar

POST PRANDIAL BLOOD SUGAR**:** 92 (37.55%) males and 64(42.10%) females were having the high values of post prandial blood sugar.

**Table 1: Risk percentage in males using LDL-C**

| RISK PERCENTAGE (%) | <40 YEARS | 40-59 YEARS | ≥ 60 YEARS |
|---|---|---|---|
| <10% | 70 | 57 | 1 |
| 10-20% | 8 | 52 | 15 |
| >20% | - | 16 | 26 |

1 patient under the age group of 20 years

**Table 2: Risk percentage in males using TC**

| RISK PERCENTAGE (%) | <40 YEARS | 40-59 YEARS | ≥ 60 YEARS |
|---|---|---|---|
| <10% | 70 | 51 | 2 |
| 10-20% | 6 | 61 | 20 |
| >20% | 1 | 13 | 20 |

1 patient under the age group of 20 years

**Table 3: Risk percentage in females using LDL-C**

| RISK PERCENTAGE (%) | <40 YEARS | 40-59 YEARS | >60 YEARS |
|---|---|---|---|
| <10% | 19 | 76 | 9 |
| 10-20% | 2 | 25 | 8 |
| >20% | - | 2 | 2 |

8 patients under the age group of 30 years

**Table 4: Risk percentage in females using TC**

| RISK PERCENTAGE (%) | < 40 YEARS | 40-59 YEARS | > 60 YEARS |
|---|---|---|---|
| <10% | 20 | 72 | 10 |
| 10-20% | 1 | 30 | 7 |
| >20% | - | 1 | 3 |

8 patients under the age group of 30 years

**DISSCUSSION**

This study reveals the prevalence of hypercholesterolemia, hypertriglyceridemia, increased levels of LDL-C and low levels of HDL-C, which are well known risk factors for cardiovascular diseases in all groups. Of the 397 patients, a higher number of male populations were noted. Increased prevalence of serum lipids was more prominent in the age groups of 40-59 in both the sexes. It has been observed that in comparison with

western population, a relatively lower level of cholesterol appears to predispose Indians to CHD. Also in a Hyderabad based hospital study, it was shown that around 75% of patients with MI had TC levels < 200mg/dL indicating that the threshold for the TC levels above which it poses a risk for CHD is low in Indians (Kumar et al 2005). In this study we have observed 123 **(**50.20%) of male patients and 82(54%) of female patients were in the desired range, yet they might be at risk for CHD.

Here we observed that 50 (20.4%) of male patients and 32 (21.1%) of female patients were having the high levels of triglycerides and 3 (1.2%) male patients were having very high levels.

In this study, males were found to be more overweight than females whereas females were found to be more obese than male population. Here we observed that 52 (21.2%) males and 20 (13.15%) females were having low levels of HDL-C.

In this study we have observed that 89(36.3%) males and 57(37.5%) females were in the borderline high, 47(19.1%) males and 21 (13.81%) females were in the high level and 7 (2.85%) males and 7(4.60%) females were having very high levels of LDL-C values.

The other CHD risk factors like blood pressure and diabetes were also found to more in the ages of 40-59 years in both the genders.

Here we observed that in Systolic blood pressure 88 (35.91%) males and 39 (25.65%) females fall in the Stage I HTN, and 48 (18.78%) males and 33(21.71%) females were in the Stage II HTN.

Diastolic blood pressure shows 71 (29%) males and 36 (23.7%) females were in the Stage I HTN, and 77 (31.42%) males and 30 (19.73%) females fall in the Stage II HTN.

Diabetics have two to three times higher risk of developing CHD In this study we have observed that 45 (18.36%) males and 20 (13.15%) females were having increased levels of FBS, 92 (37.55%) males and 64 (42.10%) females were having increased levels of PPBS.

In this study, Coronary risk prediction algorithms were used to predict the risk for Coronary heart disease using TC and LDL-C categories. The scoring based on LDL-C has shown 232 patients (128 males and 104 females) had < 10% risk ,110 patients (75 males and 35 females) were in the 10-20% risk category and 46 patients (42 males and 4 females) had >20% risk.

The scoring based on TC has shown that 225 patients (123 males and 102 females) were under < 10 % risk, 125 patients (87 males and 38 females) were in the 10-20% risk category and 38 patients (34 males and 4 females) fall in the > 20 % risk.

Since South Asian Indians have 3 times the higher risk of developing CHD when compared to western population. For LDL-C, 232 patients (128 males and 104 females) had < 30% risk, 110 patients (75 males and 35 females) were in the 30-50% risk and46 patients (42 males and 4 females) had > 50% risk.

For TC, 225 patients (123 males and 102 females) were under <30% risk, 125 patients (87 males and 38 females) were in the 30-50% risk and 38 patients (34 males and 4 females) fall in the >50% risk.

## CONCLUSION

This study concludes that there is a need for the prevention and control of Hyperlipidemia and a separate scoring system should be developed for the risk prediction towards coronary heart disease, for Indian population.

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