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Research Article

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Serum HDL Cholesterol levels in young healthy population: A cross sectional study at a tertiary care centre

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ABSTRACT

HDL cholesterol (HDL-C) level is a major risk factor in the Coronary Heart Disease (CHD).Thus interventions are required to increase HDL cholesterol to prevent the risk of Coronary heart disease. "Low HDL cholesterol" or "Hypoalpha"syndrome is the most frequent lipoprotein abnormality in coronary patients .HDL cholesterol promotes fibrinolysis. An open labelled cross sectioned study was conducted in master health check up, Out Patient Department, Sree Balaji Medical College And Hospital, Chromepet, during August 2015 to October 2015.In my study serum HDL cholesterol levels were estimated in young healthy population. 64 out of the 100 patients from study population had high serum HDL cholesterol levels (mean 42.3; SD 5.80). Treatment modalities to increase HDL cholesterol level can be adopted to avoid adverse cardiovascular outcomes.

Keywords: HDL-C, Dyslipidemia, Coronary heart disease, Metabolic syndrome

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INTRODUCTION

Dyslipidemia is one of the most significant condition in developed countries .The prevalence is about 8-9.5% in 1990 in the urban population of India. The prevalence of lipid abnormalities in 30 years old and younger age group people is increasing tremendously in developed countries. This is often due to high carbohydrate ,high fat, calorie-rich diet,alcohol consumption, tobacco use, and sedentary life style. (1) (2).Primary dyslipidemia is due to genetic defect in metabolism of lipoprotein and secondary dyslipidemia is due to underlying cause that influences circulating levels of lipid .Lipid triad (elevated triglycerides ,decrease HDL ,small dense low density lipoprotein cholesterol)is the most common established risk factor for cardio vascular disease .Risk is greater when it is accompanied by diabetics and hypertension (3) (4)

Dyslipidemia is defined by National Cholesterol Education Programme as follows:
Triglycerides ≥ 150mg/dl
Cholesterol ≥ 200mg/dl
LDLCholesterol≥130 mg/dl
HDL Cholesterol<40 mg/dl (men),and <50 mg/dl (women). (5)
HDL-C levels are independent ,strong inverse predictor of coronary heart diseases and acts as a anti atherogenic and the mechanism by which HDL protects CHD is removal of cholesterol from peripheral tissues to liver and excretion

in bile (6).The study for UK progression of diabetes suggested that 0.1 mm increase in HDL –C would reduce CHD by 15 % (7)

OBJECTIVES

To compare the HDL Cholesterol levels in men and women and to compare HDL Cholesterol levels among patients of different religions.

EXPERIMENTAL SECTION

An open labelled cross sectioned study was conducted in master health check up OPD, Sree Balaji Medical College And Hospital, Chrompet during the period of August 2015 to October 2015. The study was approved by institutional ethics committee and the patients voluntary informed written consent obtained after explaining the risk and benefits to the patient. The100 patients were randomly selected: 41 males and 59 females .Information regarding personal history, educational level, history of chronic illnesses, smoking and tobacco intake were recorded. The inclusion criteria : healthy male and female population of age >20 years and <39 years were selected .The exclusion criteria : any history of Diabetes mellitus ,Hypertension, Dyslipidemia ,pregnant women, smoking, alcohol ,and patients who were not willing to participate in the study. Patients who are <20 years and >39 years, the individuals who are not able to give informed consent, any other health or mental condition were excluded.

PROCEDURE:

3 ml of venous blood samples was collected after overnight 9 hours of fasting for estimating HDL cholesterol (mg/dl) levels by using end profile direct enzymatic method in a fully automated biochemistry analyser . (8)

STATISTICAL ANALYSIS :

Data analysis was performed by means of the SPSS statistical software package. For Windows (version 9.0; SPSS Inc., Chicago, USA). Results were expressed as the mean±SD. Pearson chi –square was test to compare the proportion between male and female

RESULTS

Mean HDL-C level in study population was 42.3 mg/dl, Standard deviation was 5.80. 64 out of the 100 patients from study population had high serum HDL-C levels .CHI-SQUARE statistic is $C^2$is 15.3188 . p value is significant at $p<0.05$(table 1).More females in the study population had lower HDL-C in comparison to males. 41% of males and 79 % of females from study population had low HDL-C levels which was statistically significant (chart 1). Hindus had lower HDL-C levels followed by Christians and Muslims in this study population (chart 2,table 2)

TABLE 1:HDL-cholestrol Normal vs Abnormal in men and women

HDL-CH Level	SEX				Total		C^2-Value	P-Value
	Male		Female					
	N	%	N	%	N	%		
Normal	24	59	12	21	36	36	15.3188	<0.05
Abnormal	17	41	47	79	64	64		
Total	41	100	59	100	100	100.0		

TABLE 2 : HDL Level in different Religion Group

	TOTAL	NORMAL HDL	LOW HDL
CHRISTIANS	12	8	4
MUSLIMS	10	9	1
HINDUS	78	47	31

CHART 1: Bar Diagram showing HDL levels in male and female

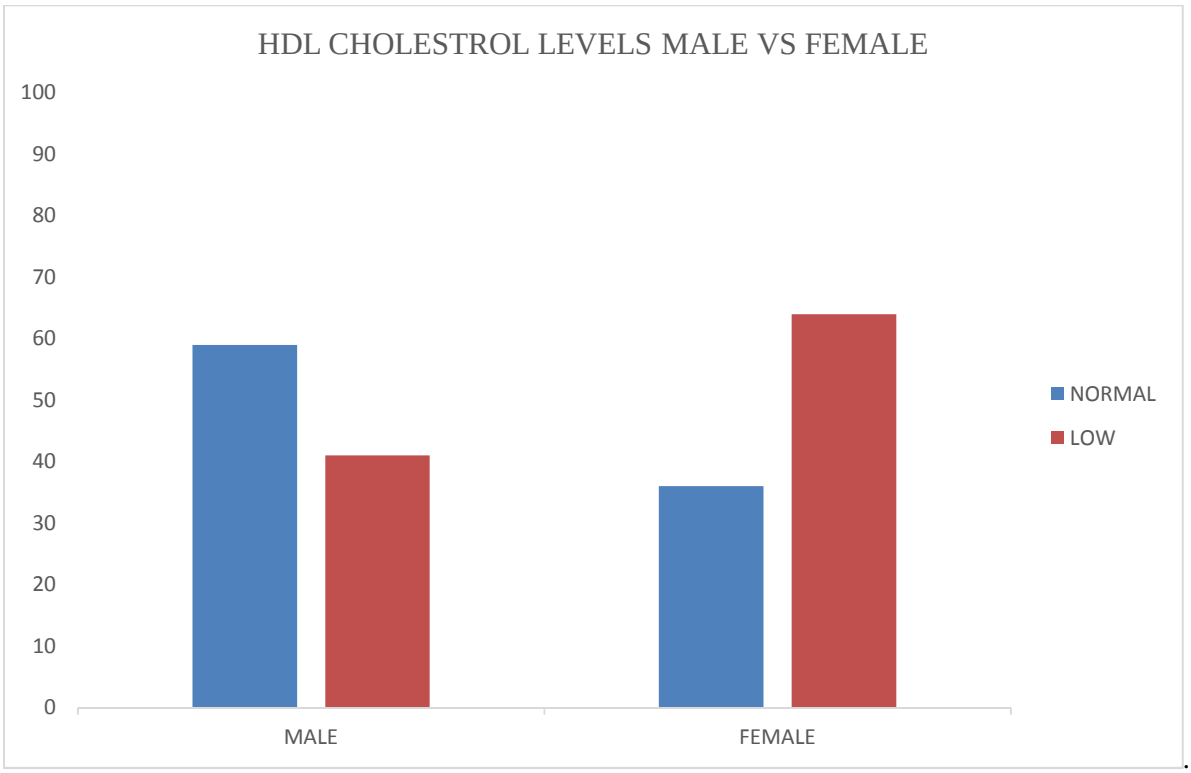
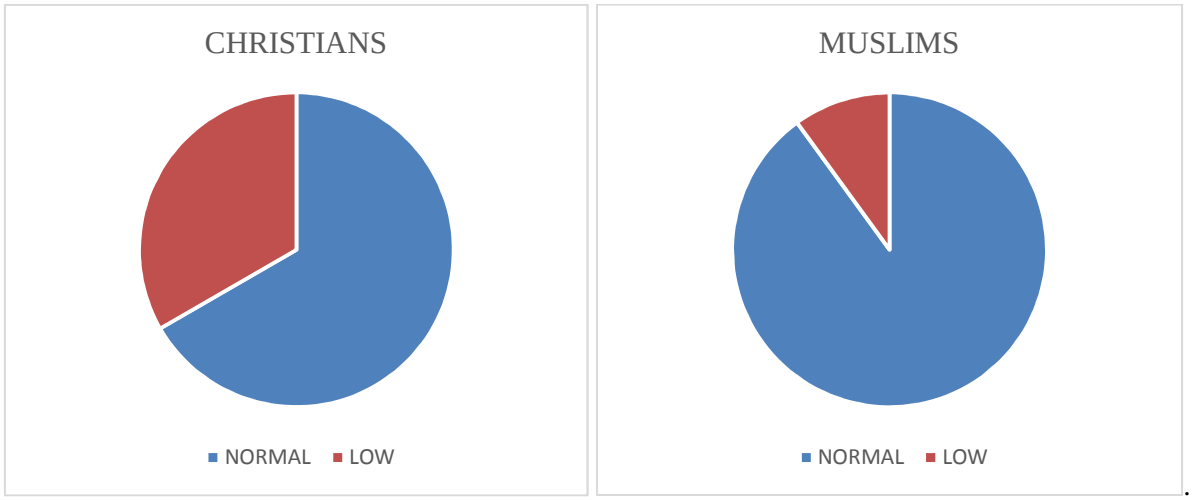
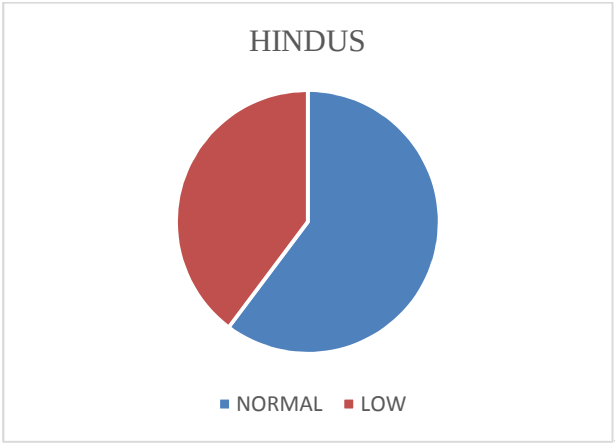


CHART 2 : HDL-C levels in different Religion Groups





DISCUSSION

Our study shows that 64% of the urban young population had abnormal HDL-C levels.41% of males and 79 % of females from study population had low HDL-C levels which was statistically significant. Margaret et al NCHS Data showed that approximately 17% of adults (just over one-quarter of men and less than 10% of women) had low HDL-C during 2011–2012 (9). Jiang et al of the Inter ASIA Collaborative group showed that prevalence of low HDL cholesterol (40 mg/dL) was 19.2% in the general adult population (35 to 74 years of age) in China. They did not observe a large difference in HDL-C levels in men and women in the Chinese population (10). Aguilar-Salinas et al showed that most common lipid abnormality was a low HDL-C (46.2% for men, 28.7% for women, and 36% for both genders) in a nationwide survey in Mexico (8)

Low HDL cholesterol is one of the component in the trait of metabolic syndrome (Reduced HDL- C ,Increased triglycerides, Increased blood sugars, Abdominal obesity, Elevated blood pressure).HDL has two main apolipoprotein components they are apoA1 and apoAII. Gene deletion of apoA 1results in low levels of HDL cholesterol. HDL has anti oxidant properties. It has anti-thrombotic, anti inflammatory activity and reverse cholesterol transport function (11)

Obesity has strongest correlation with decreased serum HDL-C levels where as weight loss have significant increase in HDL –C levels. HDL is strongly controlled by genetic factors i.e .genetic deficiency of cholesteryl ester transfer protein (CETP) is associated with elevated HDL-C levels (12) (13)

Major lipoprotein disturbance in the metabolic syndrome is a reduction in HDL cholesterol. This reduction is a consequence of changes in HDL composition and metabolism. In the presence of hypertriglyceridemia, a decrease in the cholesterol content of HDL is a consequence of reduced cholesteryl ester content of the lipoprotein core in combination with cholesteryl ester transfer protein mediated alterations in triglyceride, making the particle small and dense. This change in lipoprotein composition also results in increased clearance of HDL from the circulation. The relationships of these changes in HDL to insulin resistance are probably indirect, occurring in concert with the changes in triglyceride-rich lipoprotein metabolism.

Beyond weight reduction, there are very few lipid-modifying compounds that increase HDL cholesterol. Statins, fibrates, and bile acid sequestrants have modest effects (5–10%), and there is no effect on HDL cholesterol with ezetimibe or omega-3 fatty acids. (14)

Nicotinic acid is the only currently available drug with predictable HDL cholesterol-raising properties. The response is dose-related and can increase HDL cholesterol ~30% above baseline. (15)

CONCLUSION

More than half of asymptomatic young urban south Indians had low HDL-C values irrespective of their sexes. Females had lower HDL-C than men among the study population. Hindus had lower HDL-C than other religions

among the study population.Association of low HDL-C with increased cardiovascular morbidity and mortality is well known. This explains the need to adopt methods to raise the HDL-C in patients at risk.

LIMITATIONS OF THE STUDY

- Small sample size
- Sample bias as more patients were from Hindu population than other religions

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