ORIGINAL ARTICLE

Abnormal Lipid Profile in Patients with Coronary Artery Disease

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ABSTRACT

Objective: To determine the frequency of abnormal lipid profile in patients presented with coronary artery disease.

Study Design: Cross-sectional/observational

Place and Duration: Conducted at Wazirabad Institute of Cardiology, Wazirabad for duration of one year, November 2019 to Oct 2020.

Methodology: Total two hundred and twenty patients of both genders ages between 30 to 75 years were presented in this study. Patients detailed demographics age, sex and body mass index were recorded after taking written consent. Blood sample of all the patients were taken for laboratory test. Frequency of lipid profile (Cholesterol, triglycerides, HDL-C, LDL-C and VLDL) were measured. Complete data was analyzed by SPSS 24.0 version.

Results: Total 133 (60.45%) were males and 87 (39.55%) were females. Mean age of the patients were 54.74±4.39 years and mean BMI was 26.78± 5.14 kg/m^2. Out of 220 patients frequency of abnormallipid profile was found among99 (45%) patients. Mean total Cholesterol was201.42±8.65and Low Density Lipoprotein was 109.18±24.16 in the cases, whereas the High Density Lipoprotein-Cholesterol was 50.90±9.36. Serum Triglycerides was214.84±65.23 increased among cases

Conclusion: We found in this study that frequency of lipid profile in patients presented with coronary artery disease was very high and total cholesterol and LDL were significantly high as compared to HDL c.

Keywords: Coronary Artery, Serum triglyceride, Serum cholesterol, Lipid profile

INTODUCTION

The key causes for morbidity and mortality are known as coronary heart disease (CHD) or cardiovascular disease and have enormously large socio-economic pressures worldwide. There are numerous risk factors for CHD in the literature, such as hyperlipidemia. By 2020, more than 11.1 million deaths from the CHD are expected by the World Health Organization (WHO). Annual cardiovascular deaths are expected to grow to 25 million by 2030 from 17.5 million in 2012. About 14 million Indian people suffering from coronary heart disease (CHD), 1.5 million of whom die annually from Acute Myocardial (AMI) and 500,000 of whom die every year. This is due to industrialization, urbanising and related shifts in the style of living that is referred to as epidemiologic transition[1,2]. Blood flow loss is caused by the partial or full blockage of one or more these arteries. On the surface of the heart are the four major coronary arteries of the left, main left, circumflex arteries and descending left anterior arteries .[3]

CHDs are sudden death's most predictable cause. For several years, the prevalence of CHD in developing countries has been thought to be relatively low. A surprisingly high proportion of mild to serious CHD has been recorded in recent studies in several patients. Men have a higher prevalence of CHD than women. Its prevalence however has a link with age. In 18 to 45 years, it's around 0.7% and 55 years and beyond 13.3%. The age-standardized CVD mortality rate of 272 per 100000 inhabitants in India is projected to be above the world average of 235 in every 100,000 population, according to the global Burden of Disease study[4,5].

The following are recommended values for above-mentioned cardiovascular risk factors in compliance with the recommendations of the American Heart Association: total cholesterol: 40 mg/dL; and LDL: [6]

The word cardiovascular disease is a category of heart or blood vessel disorders that include primarily ischemic heart disease, rheumatism and strokes. The lipid profile is a group of tests frequently carried out together to determine the likelihood of cardiovascular disorders. These tests indicate whether anyone might have a heart attack or a stroke due to the obstruction of blood vessels or artery hardness. They are excellent indicators. The lipid profile typically includes: elevated blood circulation cholesterol levels are closely related to cardiovascular progression. Usually total blood cholesterol synthesis is about 1g (1000 mg) per day in a person with approximately 68 kg.

In order to reduce its risk factors CHD needs an integrated approach. The detection and control of risk factors are important in the primary prevention and prevention of recurring CHD as a secondary prevention in asymptomatic individuals over 40 years of age. The control of risk factors should be thought of as the treatment or mitigation of the phase of the atherosclerotic illness. Risk factors for CHD are modifiable and unalterable; the existence of risk factors which cannot be altered can require more intensive risk factors management.[9]

In the past 20 years, significant progress has been made in identifying and strengthening the risk factors for CHD such as diabetes and hypertension. In clinical practice Lipids and lipoproteins have become ever-increasingly significant due primarily to their association with CHD in their abnormalities known as dyslipidemia. According to

epidemiological studies, they were the key risk factor for the development of this disease, especially in affluent countries where fat intake is high[10].

MATERIAL METHODS

This cross-sectional study was conducted at Wazirabad Institute of Cardiology, Wazirabad for duration of one year, November 2019 to Oct 2020 and comprised of 220 patients. After taking informed written consent, detailed demographics including age, sex and body mass index were recorded. Patients who had liver impairment, renal disease or thyroid disease, and those did not give written consent wereexcluded from this study.

Patients were aged between 30-75 years with both sexes. All patients of coronary artery disease were presented and blood samples were obtained. Patients having fasting lipid profile [serum triglycerides, low density lipoprotein (LDL), and high density lipoproteins (HDL)], blood sugar levels and serum homocystein levels were measured. Standard deviation formula was used to measure numerical data and demographics details were measured in terms of percentages and frequencies. Complete data was analyzed by SPSS 24.0 version.

RESULTS

Total 133 (60.45%) were males and 87 (39.55%) were females. Mean age of the patients were 54.74±4.39 years and mean BMI was 26.78± 5.14 kg/m^2. 45 (20.45%) patients were less than 35 years, 120 (54.55%) patients were between 35-60 and the remaining 55 (25%) were >60 years of age.(table 1)

Table 1: Characteristics details of presented cases

Variables	Frequency (n=220)	%age
Sex		
Male	133	60.45
Female	87	39.55
Mean Age (years)	54.74±4.39	
Mean BMI (kg/m^2)	26.78± 5.14	
Age distribution		
<35 years	45	20.45
35-60 years	120	54.55
>65 years	55	25
Total	220	100

Out of 220 patients frequency of abnormal lipid profile was found among 99 (45%) patients and the rest were 121 (55%) patients were non lipid profile. (table 2)

Table 2: Prevalence of abnormal lipid profile among patients

Variables	Frequency (n=220)	%age
Abnormal lipidprofile		
Yes	99	45
No	121	55

We found that high LDL was among 44 (20%) patients with mean 109.18±24.16, total cholesterol was found in 40 (18.18%) with mean 201.42±8.65,increased triglycerides 35 (15.91%) with mean 214.84±65.23 and HDL c (<40mg/dl) in 150 (68.18%) with mean 50.90±9.36. (table 3)

Table 3: Association of lipid profile among patients of coronary artery

Variables	Frequency	%age	Mean
Lipid Profile			
LDL (>130mg/dl)	44	20	109.18±24.16
TC (>200mg/dl)	40	18.18	201.42±8.65
TG (>150mg/dl)	35	15.91	214.84±65.23
HDL c (<40mg/dl)	150	68.18	50.90±9.36

DISCUSSION

CHD is now the largest cause of death in the world. High LDL-C, reduced HDL-C, tabaking, hypertension, resistance to insulin with or without an apparent diabetes mellitus, age and premature CHD family history are the major risk factors. The elevated CHD risk accounts for 85% of modifiable risk factors, of which plasma cholesterol is the most important. Lipid profile abnormalities, particularly hypertriglyceridemia and low HDL-C levels, have been shown to be highly prone to a large number of diseases such as obesity, diabetes and cardiovascular diseases. For every 1 mg/dL rise in HDL-C, the risk of CVD has been estimated to decline by about 2-3%. [11] Elevated triglyceride levels, both fasting and non-fasting tend to be an independent risk factor for CHD amid some controversy. [12,13]

In our study total 220 patients of coronary artery disease were presented. Frequency of female was lower 39.55% than that of males 60.45%. Mean age of the patients were 54.74±4.39 years and mean BMI was 26.78± 5.14 kg/m^2. 45 (20.45%) patients were less than 35 years, 120 (54.55%) patients were between 35-60 and the remaining 55 (25%) were >60 years of age. These results were comparable to the previous study.[14]

In our study prevalence of abnormal Lipid Profile in our patients with CAD was higher 45% as compared to previously reported.12, 13, 14, 15 Mohan etal.[15] On the other hand Rubin et al [22] observed a marked difference between the 2 populations for all age groups, lower HDL-C and higher TG levels among men with CAD when contrasting their populations to CAD for general American men. [16]

Increased triglycerides (>150 mg/dl) were present in 15.91% of our CAD patients with mean 214.84±65.23 depending upon age, presence or absence of hypertension.[23,24] Other studies from our region found that CAD patients had significantly higher TG and TC and lower HDL-C levels than individuals with no CAD. [17,18] We found that high LDL(>130mg/dl) was among 44 (20%) patients with mean 109.18±24.16, total cholesterol (>200mg/dl)was found in 40 (18.18%) with mean 201.42±8.65 and HDL c (<40mg/dl) in 150 (68.18%) with mean 50.90±9.36. [17,19] LDL-C is well documented in the pathogenesis of CHD. The advantage of lowering LDL in high-risk patients is therefore well documented. This study showed that LDL-C in the CHD community has significantly increased. In patients with proven CHD and in those with risk equivalent C HD, the National Cholesterol Education Program (NCEP) recommends an LDL-C target of <100mg/dl. Less progressive atherosclerosis, lower rates of renewal and less ischemic events than mild LDL-C decreases or traditional therapies are associated with an aggressive LDL-C decrease .[20]

The TC/HDL-C rates in men aged 35-60 years were considerably increased in this study overall. In another study, plasma HDL cholesterol levels and TC/HDL ratios were found to be two significant risk factors in patients suffering from heterozygote familial hypercholesterol. This research shows that the LDL C/HDL-C level eight times higher than the HDLC level, in patients with FH, predicts an adverse CHD event.[21] This study is a valuable method to determine the risk of CVD in all populations.

CONCLUSION

We found in this study that frequency of lipid profile in patients presented with coronary artery disease was very high and total cholesterol and LDL were significantly high as compared to HDL c.

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