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Role Of Statins In Treatment Of Coronary Artery Disease

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ABSTRACT

AIM:the prospective study was conducted to study the role of statins in the management of CAD, to assess the patients characteristics and their variables with the possible ADRs.

MATERIALS: This was a Prospective and Observational study in which 100 patients were enrolled based on the inclusion and exclusion criteria from Sagar hospital. The inclusion criteria was to include patients who were priorly diagnosed with CAD aged above 18 yrs , and lactating womens were excluded.

METHOD: this was the prospective and observational study conducted in sagar hospitals involving 100 patients diagnosed with CAD. This study was conducted for the period of 06 months.This study was assessed and evaluated by a suitable statistical method. The study subjects were enrolled in the study based on complaints of CAD. Various tests like ECG, CAG, 2D ECHO, Lipid profile were studied.

RESULTS:the results followed asIn recovered patients, LDL (32%) and total cholesterol (66%) were in the normal range, and HDL (36%) & TGL (32%) were within risk limits. All the patients were treated with statins and prescribed prominently with Rosuvastatin (60%) and a combination of Atorvastatin and Aspirin in the patients diagnosed with Myocardial Infraction(MI) or with a high risk of MI[2]. The outcome of this study was monitored with the help of variables; statins were more effective[1].This study observed that the social habits of the patients influence the severity of the disease condition. Statins were a more useful treatment to reduce LDL and raise the HDL. Finally, concluded statins were safe for all age group patients and required dosage modifications in CKD and DM patients.

KEYWORDS: Antihyperlipidemic, Coronary Artery Disease, Myocardial Infraction, Statins, CKD(chronic kidney disease), DM(diabetic Mellitus)

I. INTRODUCTION

Coronary Artery Disease (CAD) in which there is a narrowing or blockage of the coronary arteries. Coronary heart disease is usually caused by atherosclerosis. CAD is a condition of recurring chest pain or discomfort that occurs when a part of the heart does not receive enough blood. Cardiovascular disease (CAD) arises when cholesterol particles in the blood start to collect on the walls of the arteries that provide blood to the heart. This condition most frequently happens during effort or excitement when the heart requires more blood flow.

Several risk factors can increase the risk of developing coronary heart disease (CHD). These include high blood pressure, high cholesterol, diabetes, smoking, being overweight, not doing enough activity. Risk factors you can't control include family history, age, ethnic background. anti-inflammatory, anti-thrombolytic and antiproliferative effects.For preventive measures, statin medications are considered standard practice following any cardiovascular events and for people with a moderate to high risk of development of cardiovascular disease. The treatment goal is to stop the progression of the disease and complications the principle of giving statins is mainly to manage underlying cause correction. Statin is indicated in conditions of clinical atherosclerosis (including myocardial infarction, acute coronary syndromes, stable angio coronary artery disease, and stroke).Coronary atherosclerotic heart disease is the largest contributor to CVDs due to atherosclerosis, a chronic inflammatory condition of the coronary arterial wall. Atheroseffectscause cardiovascular stenosis and obstruction, further leading to myocardialischemia and hypoxia and ultimately giving rise to myocardial necrosis and even cardiac death.

CHD is considered a common complex multifactorial disease associated with risk factors such as Hyperlipidemia, HTN, DM, smoking, alcohol consumption, and obesity.CAD can be managed by controlling risk factors. Hence statins play important role in reducing cholesterol levels. This helps in lowering the mortality of CHD because lowering the plasma high cholesterol level

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is an important way to reduce the chances of suffering CHD events. Here the statins used are atorvastatin, rosuvastatin, and a combination of atorvastatin and aspirin. The study was conducted to evaluate the effectiveness of the statins and to assess the pleiotropic effects of statins in the treatment of CAD. This study will benefitdoctors to individualize statin therapy for better healthcare.

II. METHODOLOGY

A hospital-based prospective study was conducted within the Cardiology Department of Sagar Hospitals. The study was conducted on 100 patients who met the inclusion and exclusion criteria Patients with cardiovascular problems who admitted to the cardiology department of Sagar Hospitals, Bengaluru. The patient who met the criteria were enrolled for the study. An individualized data collection form was used to collect patient characteristics such as age, sex, social habits, which was approved by the ethical committeeof Sagar Hospitals Banglore. There were patients diagnosed withCAD by the physician with relevant laboratory data and were treated with statins and its combinapatient'spatient medical chart, progress note was used to monitor the laboratory data such as ECG, ECHO, Lipid Profile Tests, etc. and had a check on possible ADRs these data was documented in suitable data collection form during the study period. The data were evaluated by using suitable statisticalstools. All patients admitted with coronary artery disease (CAD) during the study period in the Cardiology Department were studied to determine the role of statins in the treatment of coronary artery disease. To determine the pattern and the nature of statins details such as the brand name, generic name, class, dose, frequency, and duration of therapy, dose adjustment before and after lipid profile tests were coelected.Descriptive statistical analysis has been carried out in the present study. Mean and standard deviation are used to measure the central tendencies of given data. Microsoft word and excel are used to generate tables and graphs respectively.

III. RESULTS

The results showed that the majority of patients were admitted to the hospital with complaints of chest pain. Out of 100 subjects, the majority(76%) were male patients and 24% of patients were females. we observed that 32% of patients are 61-70 years old& 24% of patients are 70-80 years old. This puts up that elderly patients of age 61-80 years are more at risk of CAD. Then 63% of the subjects are smokers and 37% of patients were non-smokers, 59% of are alcoholics, then 77% were non-vegetarians and 23% were vegetarians, which indicates that social habits have a high influence on CAD. cigarette lets carbon monoxide, nicotinic acid chemicals into the body causing plaques in major arteries resulting in atherosclerosis The patients were treated with Rosuvastatin (60%), Atorvastatin (24%), and the patients with high risk & abnormal Troponin-I were treated with Atorvastatin & Aspirin (16%), and monitored for lipid profile test, to evaluate the recovery status of the subjects. This treatment helped in the successful recovery from the disease and its complications in 77% of the patients. From this, we can summar
ize that HMG CoA reductase inhibitor drugs can be used inthe supportive treatmentof CAD aThey can significantly decrease the risks of CVD and fatality.

IV. DISCUSSION

The distribution of subjects according to the age and is found to bea higher number of patients fall under 61-70 year age group which accounts 32% and second-highest population falls under 71-80 year age group therefore 24% and least was found in the age group of 30-40 years accounting 2% of the total population[6].The population distribution according to vegetarian and non-vegetarian, we observed that 23% are vegetarian and 77% are non-vegetarian. subjects and subjects distributed according to alcohol consumption 59% were alcoholic and 41% were non-alcoholic[7]. 63% of subjects were smokers and 37% were non-smokers[5]. Patients diagnosed with CAD with proper laboratory data were treated with statin where 24% of patients are given atorvastatin, 60% of patients were given with Rosuvastatin which is projecting that rosuvastatin is a potent drug with low side effects. 16% of the patients who were diagnosed with myocardial infarction and higher risk of myocardial infarction were given atorvastatin and aspirin combination. 77% of the patients showed recovery and 23% of patients did not improve after the treatment.32% of subjects had LDL in normal limits, 36% of them had HDL in risk limits 32% of subjects had TGL at very high ranges and 66% of them had normal total cholesterol. A similar study was done by Timothy J. Wilt, MPH, Hanna E. Bloomfield, Roderick MacDonald, et al concluded that statin therapy reduces mortality and morbidity in adults with CHD, even at pretreatment LDL-C levels as

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low[4].Statins lower the LDL level and thereby helps to increase the good cholesterol (HDL) in the body.

V. SUMMARY

Statins, so called HMG CoA reductase inhibitors are known to play major role in CVD therefore majorly in CAD. The major objective was to analyze the role of statins in the treatment of CAD. The study was conducted to assess the patient characteristics and to assess the ADRs.The prospective and observational study was conducted in the Cardiology department of Sagar Hospital-Bengaluru. 100 patients diagnosed with CAD were enrolled to perform the study which was carried out over the period of six months. All the patients were prescribed with statins. Pregnant and lactating women and children less than 18 years of age were excluded from the study .Various data sources like patient case note, physician case note, nurse note, laboratory reports etc were used.The results showed that majority of patients were admitted to the hospital with angina .Out of 100 subjects, majority (76%) were male patients and we observed that 32% of patients are of 61-70 years & 24% of patients are of 70-80 years. This puts up that elderly patients of age 61-80 years are more under risk of CAD. 63% of the subjects are smokers, out of which 42% & 21% were in non-veg & veg diet, and 59% of are alcoholic, out of which 53% & 6% were in non-veg & veg diet, which indicates the social habits have high influence in CAD. Smoking ciggrate, lets carbon monoxide, nicotinic acid chemicals into body causing plaques in major arteries resulting atherosclerosis The patients were treated with Rosuvastatin (60%), Atorvastatin (24%) and the patients with high risk & abnormal Troponin-I were treated with Atorvastatin &Aspirin (16%), and monitored by the help of lipid profile test,which helped in the successful recovery from the disease and its complications in 77% of the patients. From this, we can summarize that HMG CoA reductase inhibitor drugs can treat CAD and can significantly decrease the risks of CVD and fatality./It lowers cholesterol level significantly and prevents the further complications of CAD. The study is important for clinicians in order to provide accurate treatment of statins.

VI. CONCLUSION

Coronary artery disease is one of the fast fatalityality-caus tothediseasroughout the world. the risk factor causing CAD will change according to the individual. In our study, a total of 100 subjects diagnosed with CAD were enrolled, has assessed, and evaluated the effect of statins. Patients'characteristics were assessed and evaluatedthe study showed the prevalence of males was more than females. More number of patients were identified with CAD in the age group greater than 60 years old as elder patients are more prone and the organs depletion occurs according to the age progression and as the stated in the occurrence of more number of patients were identified smokers (63%) due to the toxic agents which lead to the destruction of veins in the smokers and alcoholic (59%) as the lipid concentration is hiked by alcohol consumption.

Laboratory values of the patients were ECG (Electrocardiogram), CAG (Cardiac angiogram), and 2D ECHO followed by lipid profile test before and after the treatment. Various other tests inclutestsenal fucontestsest (serum creatinine, sodium, potassium), hematology, cardiac markers (troponin- I, and CK-MD). these parameters were chosen as they are likely to show abnormalities in cardiac function. Most of the patients were treated with rosuvastatin and atorvastatin. The patients with a higher risk of myocardial infarction were treated with atorvastatin and aspirin[3].The Outcome of this study is to assess the role of statins in the treatment of coronary artery disease. This study allows evaluationthe effect, age, social habits, diet, on the prevalence of CAD and possiblyserious consequences. This study provides laboratory data to monitor the effect of statins in lowering cholesterol among the CCAD-diagnosed patients and improve their health condition in terms of cardiac function[3]. Clinicians can be providing accurate treatment for statins as prophylaxis and management of CAD with lethe ast side effect it also includes evaluation of various laboratory data which shows significant changes after the treatment with statins LDL reduction and HDL elevation. Statins are safe for all age group patients. This study is important to analyze the characteristics of statins and their effect in CAD.

VII. ACKNOWLEDGEMENT

Authors acknowledge the immense help received from the scholars whose articles are cited and included in references of this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed.

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We extend our thanks to Dr. Manoj Kumar M, for his support and guidance in the statistical analysis.
Last but not least, we extend our thanks to all our colleagues who have been here alongside each other throughout this journey.

CONFLICT OF INTREST

The authors declare that there is no conflict of intrest.

ETHICAL APPROVAL

Ethical committee clearance was obtained by the institutional ethical committee of Sagar Hospital, Bengaluru.

ABBREVATIONS

CAD-coronary artery disease,CKD-Chronic kidney disease, MI-Myocardial infraction, HDL-High density lipoprotein, LDL-Low density lipoprotein, TGL-Triglycerides level, ECG-Electrocardiogram, CAG-Coronary artery angiography, ECHO-echo cardiogram, DM-Diabetic mellitus, HTN-Hypertension, CKMD-Creatinine kinase due to muscle damage, CCAD-Central compartment atopic disease, CHD-Congenital heart defects.

AUTHORS CONTRIBUTIONS

- Introduction:[B Kishore Kumar]
- Methodology:[Reshma P]
- Analysis: [B Kishore Kumar]
- Investigation:[Reshma P]
- Edit and review:[Mrs Mahadevamma L]

Illustration

Table no. 01: Distribution of subjects according to age group

Age group	Frequency	Percent
30 to 40	2	2.0
41 to 50	16	16.0

Mean age: 64.90 Std. deviation: 12.719

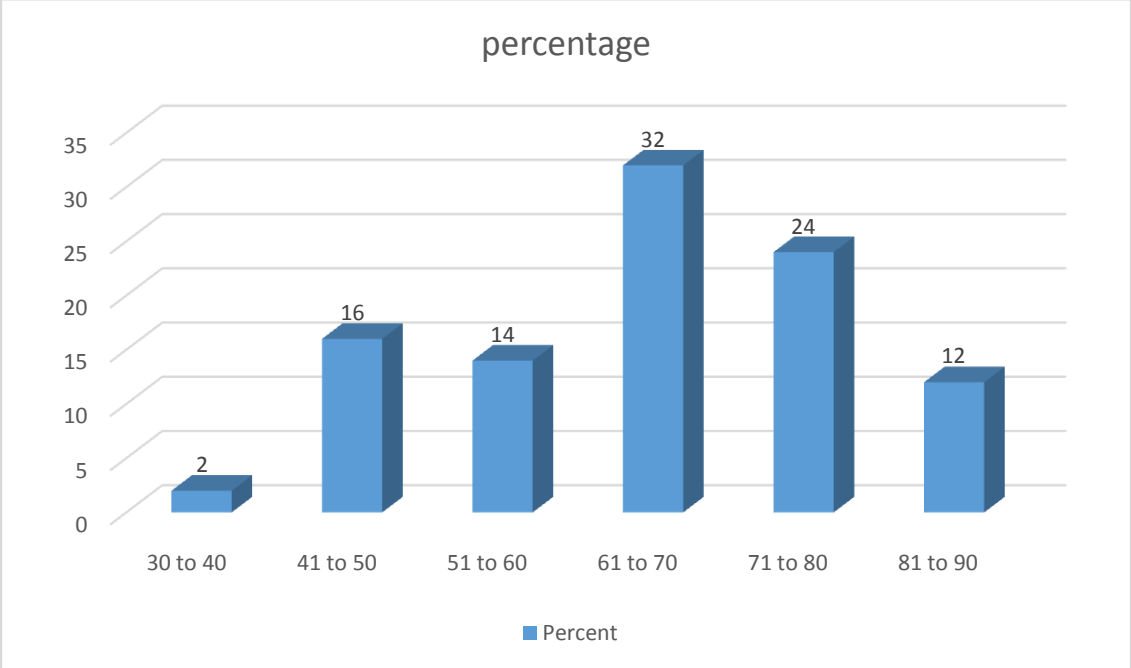

Figure no. 01: Distribution of subjects according to age group

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From the distribution of subjects according to age, a greater number of patients were identified at the age group of 61 to 70 years (32%) the and least was found in the age group of 30 to 40 years (2%)[6].

Table no. 02: Distribution of subjects according to alcoholic habit

Alcoholic	Frequency	Percent
No	41	41.0
Yes	59	59.0
Total	**100**	**100.0**

Subjects were distributed according to alcohol consumption habits. In the total study population, we observed that 59% were alcoholic and 41% were non-alcoholic[7].

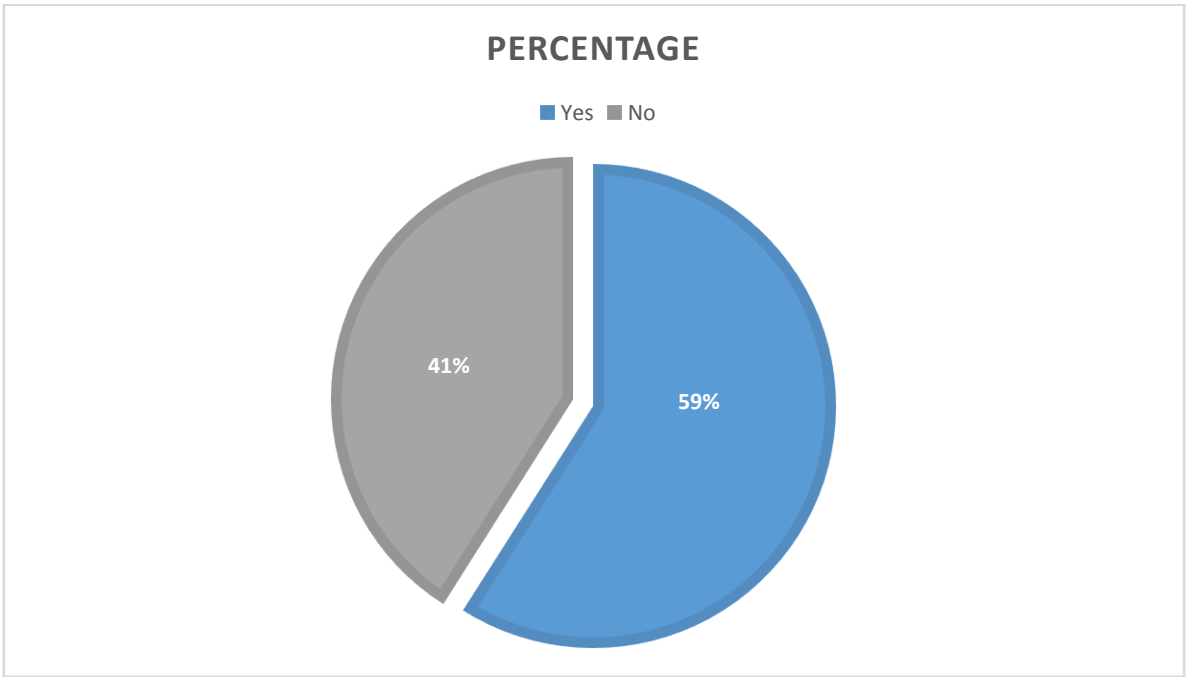

Figure no. 02: Distribution of subjects according to alcoholic habit

Subjects were distributed according to alcohol consumption habit. In total study population, we observed that 59% were alcoholic and 41% were non-alcoholic.

Table no. 03: Distribution of subjects according to Smoking habits

Smoking	Frequency	Percent
Yes	63	63.0
No	37	37.0
Total	**100**	**100.0**

Subjects were distributed according to theirsmoking habits. In the total study population, we observed that 63% were smokers and were 37% non-smokers[5].

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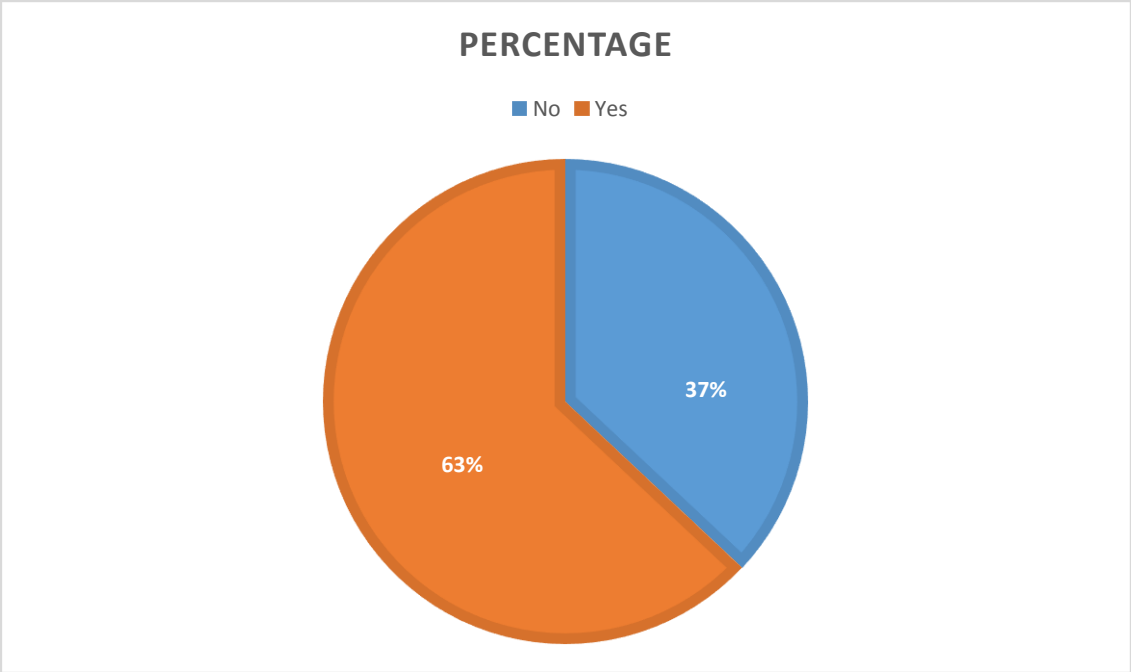

Figure no. 03: Distribution of subjects according to Smoking habits

Subjects were distributed according to smoking habit. In total study population, we observed that 63% were smokers and were 37% non-smokers[5].

Table no. 04: Distribution of subjects according to lipid profile based on the outcome

Parameter	Range	Before		After		Outcome		
		n	%	n	%	Recovered	Not Recovered	Total
LDL	Normal	27	27.0	40	40.0	32	8	**40**
	Risk	13	13.0	13	13.0	10	3	**13**
	Borderline High	11	11.0	29	29.0	25	4	**29**
	High	29	29.0	9	9.0	6	3	**9**
	Very high	20	20.0	9	9.0	4	5	**9**
	Total	**100**	**100.0**	**100**	**100.0**	**77**	**23**	**100**
HDL	Risk	72	72.0	41	41.0	36	5	**41**
	Borderline Low	8	8.0	30	30.0	22	8	**30**
	Normal	20	20.0	29	29.0	19	10	**29**
	Total	**100**	**100.0**	**100**	**100.0**	**77**	**23**	**100**
TGL	Normal	8	8.0	29	29.0	28	1	**29**
	Borderline high	6	6.0	17	17.0	17	0	**17**
	High	86	86.0	54	54.0	32	22	**54**
	Total	**100**	**100.0**	**100**	**100.0**	**77**	**23**	**Cholesterol**
Cholester	Normal	29	29.0	81	81.0	66	15	**81**
	Borderline high	17	17.0	15	15.0	8	7	**15**
	High	54	54.0	4	4.0	3	1	**4**
	Total	**100**	**100.0**	**100**	**100.0**	**77**	**23**	**100**

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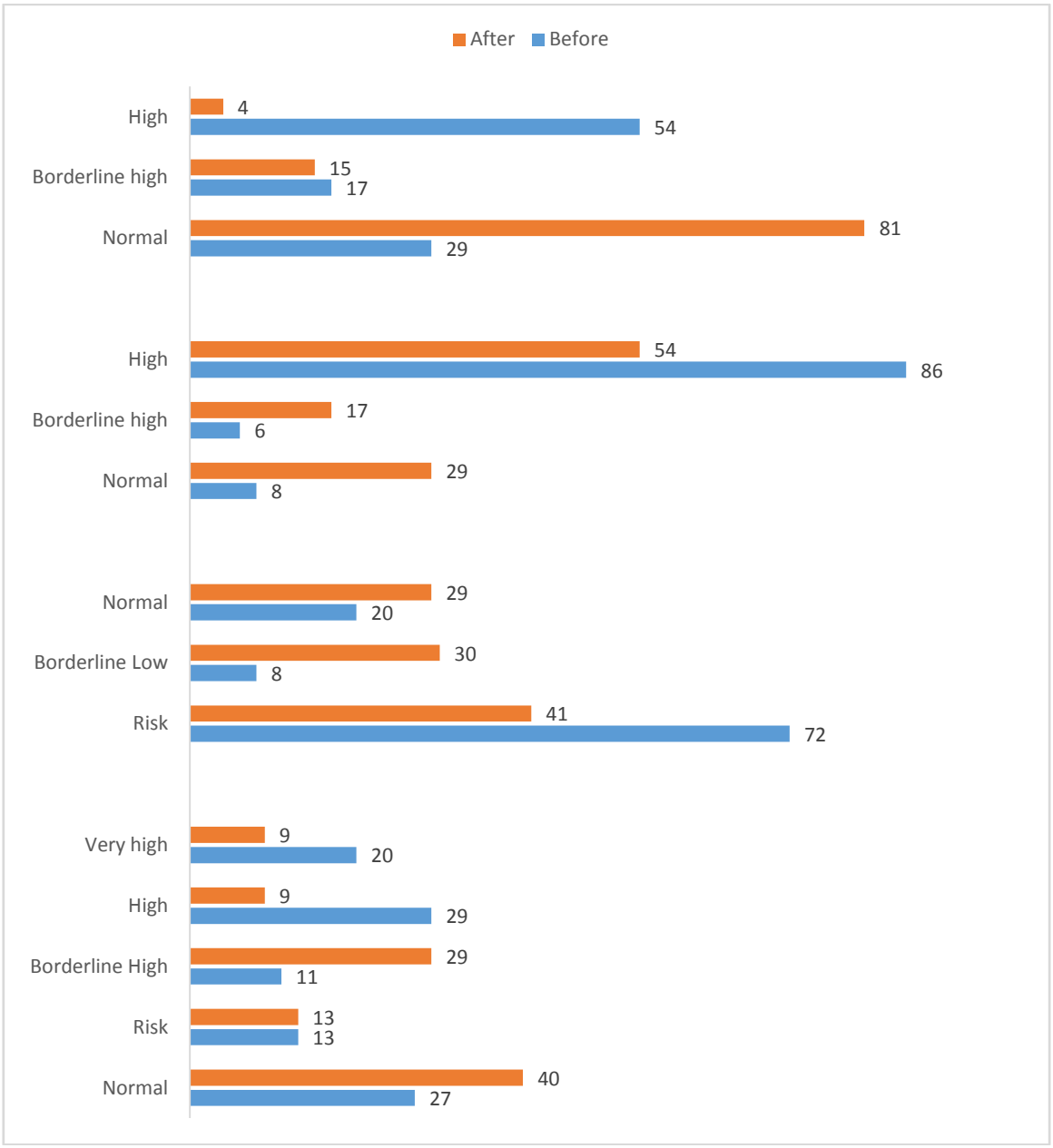

Figure no. 4: Distribution of subjects according to lipid profile based on the outcome

In our study, we found that patients even had abnormal Lipid profile test even after the treatment with HMG CoA reductase inhibitors.we observed that 61 % of the patients had LDL in the range from risk to high; 71% had their HDL level at risk and Borderline low; 71% had their TGL in the range of borderline to high risk and 19% had their total Cholesterol in the range of Borderline to high[4].

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ETHICAL CLEARANCE CERTIFICATE

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02 July 2021

Sub : Ethics Committee approval for Protocol of Pharma D Project

With reference to the above subject, the following 5th Year Pharm D Students of East West College of Pharmacy, Bengaluru have applied for Ethics Committee Approval for their Protocol of Pharma D Project.

Sl. No	Name of the Students	Guide	Project Protocol Topic
a) b) c)	Reshma P B Kishore Kumar Tanjina Kabir Tuhin	Mahadevamma L	"Role of Statins in Treatment of Coronary Artery Disease"

Based on the prospective data collection and the presentation to the **Institutional Ethics Committee**, we are pleased to accord approval for the protocol to be published.

Dr. (Major) Mahendra Kumar
Medical Director & Member Secretary
Ethics Committee

SAGAR HOSPITALS Jayanagar Bangalore-41

Justice. B. A. Muchandi
Chairman
Ethics Committee