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Status Of Dyslipidemia Management With Statins, In In-Patients With Known Coronary Artery Disease Confirmed By Angiographic Findings

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Abstract: *To determine the status of dyslipidemia management with statins in In-patients with known Coronary Artery Disease (CAD) confirmed by angiographic findings. This study has been conducted in a corporate cardiac centre at Visakhapatnam, Andhra Pradesh. This study is a retrospective analysis of data collected from the electronic medical records in terms of age, sex, CAD status, associated risk factors, statin usage, and lipid parameters. Among a sample of 92 known CAD in-patients, 81.5% achieved LDL-C goal of <100 mg/dl as recommended by Third Report of the National Cholesterol Education Program (NCEP) Adult Treatment Panel III [ATP III] for CAD and CAD risk equivalents. Success rates among males and females are 79.7% and 85% respectively. 78.2% of 69 patients on Atorvastatin, 85% of 20 patients on Rosuvastatin and 100% of 3 patients on Simvastatin achieved LDL-C goal. If the target LDL-C level is kept at <70 mg/dl as defined as optional goal for very high risk CAD and CAD risk equivalents, the success rate is only 31.5%. The LDL-C goal (<100 mg/dl) achievement rate is satisfactory in this facility. But the major concern in this study is even with desired LDL-C levels 61% of these in-patients suffered with a recurrent CAD leaving an opportunity to reconsider the target LDL-C to still lower levels (<70 mg/dl) which is mentioned just as an optional for very high risk candidates in NCEP ATP-III guidelines. Further larger, prospective, randomized controlled clinical trials and multi-centric Indian trials involving both in-patients and out-patients have to be conducted to find the success rates, CAD recurrence rates and to fix new target levels of LDL-C and the best statin that suits Indian scenario.*
Keywords*: Coronary artery disease, Lipid management, Statins.*

I. Introduction

Coronary artery disease (CAD) is the leading cause of death worldwide. Indians are 4 times more susceptible than the Americans[1]; in fact Indians have the highest mortality rates amongst all ethnic groups studied so far. Out of many risk factors[2], Triglyceride is an important independent risk factor for CAD and is especially important in Indians because of high prevalence of Hypertriglyceridemia in this population. Many of the components of Lipid parameters like a low HDL, high LDL act as individual risk factors for the development of CAD. Some components like high LDL have also shown to increase recurrence of cardiovascular events in a known CAD patient. 3-Hydroxy-3-methylglutaryl coenzyme-A reductase inhibitors (statins) are extremely effective at reducing low density lipoprotein (LDL) cholesterol[3] and have been demonstrated to reduce mortality and the risk of major cardiovascular events in a number of large primary[4,5] and secondary prevention[6-8] studies. Statin therapy in patients undergoing cardiac valve procedures is also associated with decreased postoperative morbidity and death. Though there are many studies proving the relation between Cholesterol levels and CAD and the protectiveness of Statins, only limited studies are available on the actual dyslipidemia management status especially in India. In view of all the above facts this study is conducted to know the actual status of dyslipidemia management in known CAD patients. The National Cholesterol Education Program (NCEP) Adult Treatment Panel-III (ATP-III) guidelines[9]

Recommend a target level of LDC-C <100 mg/dl and an optional target level <70mg/dl in very high risk cases. There are also some studies which suggest that the target LDL-C level should be still lowered.

II. Materials And Methods

The patient data is retrieved from the Discharge summary module of Wipro HIRePS-HIS. Microsoft Office Excel 2007 is used for data representation, percentage calculation and graphical depiction. SPSS version 16 is used for statistical analysis. The CAD confirmation was done by Coronary Angiogram and serum lipid levels have been determined on fasting samples using Biokit Quantex analyzer.

Design And Conduct

After taking approval from the Institutional Ethics Committee, Apollo hospitals, Visakhapatnam, this retrospective study is conducted on the in-patients of cardiology department belonging to a single consultant cardiologist. The data for the patients who got admitted in the last 6 months is collected. The total number of admissions were 509. The necessary data like age, sex, risk factors like Hypertension (HTN), Diabetes Mellitus (DM), CAD status (confirmed by Coronary angiogram) and lipid parameters, treatment that is being taken are charted out. The collected data are screened for known CAD patients confirmed by Coronary Angiogram and who were on statins for not less than 3 months. Hypothyroidism patients and those who have familial hyperlipidemia are excluded from the study. The patient data with incomplete information are discarded. Out of 509, only 92 patients fulfil the desired criteria and hence considered for the study.

III. Results

The mean age of the sample (n=92) is 61.48 ± 10.37 .The males and females in the sample are 82% and 18% respectively. Of the total sample 73% of the patients have HTN, 77% have DM and 42% have both HTN and DM. Patients on Atorvastatin, Rosuvastatin and Simvastatin are 75%, 21.7% and 3.3 % respectively (Table-I).

Table.I. Patient Demographics

Variable	Number	Percentage of Total sample (n=92)
Total Sample	92	100%
Age	61.48 ±10.37	
Sex Males		
Females	76	82.6%
HTN	16	17.4%
DM	68	74%
Both HTN and DM	48	52%
Statins usage	39	42.4%
Atorvastatin		
Rosuvastatin	69	75%
Simvastatin	20	21.74%
	3	3.26%

About 61% of the admissions (sample(n)=92) are due to a recurrent CAD, of which, 32% have Single vessel disease, 21% each for Double and Triple vessel disease and remaining have mild CAD (11%), Occluded graft (2%), Clinical presentation like Acute coronary syndrome (6%) and Unstable angina (7%) (Table-II). The other reasons for admission are Chest pain (Non-cardiac) (14%), Permanent pacemaker implantation (2%), Shortness of breath (LV dysfunction, COPD) (9%) , CVA (1%) and others (LBA, Fractures, Gastritis, Weakness) (9%).

Table-II. Reasons for Admission/Readmission

Diagnosis	Number	% of Total sample (n=92)
Recurrent CAD (Mild CAD+Occluded graft+SVD+DVD+TVD+ACS+USA)	56	61%
Mild CAD	6	7%
Occluded graft	1	1%
SVD	18	20%
DVD	12	13%
TVD	12	13%
ACS (CAG not done)	3	3%
USA	4	4%
Recurrent CAD for which revascularisation (PTCA) done	38	41%
Elective revascularisation of old lesion (confirmed earlier by CAG)	4	4%
Chest pain (but normal coronaries or patent stents on CAG/nonspecific)	13	14%
Permanent Pacemaker Implantation	2	2%
Shortness of breath due to LV Dysfunction/COPD	8	9%
CVA	1	1%
Others (fractures, LBA, Gastritis, Weakness)	8	9%

Among the in-patients with known CAD (n=92), the achievement rate for target LDL-C (<100 mg/dl) is 81.5% with a mean LDL-C of 80.9±19.59 (mg/dl). The achievement rates among males and females are 79.7% and 85% respectively (Table-III). 78.2% of 69 patients on Atorvastatin, 85% of 20 patients on Rosuvastatin and 100% of 3 patients on Simvastatin achieved LDL-C goal (Table-IV).
If the Target LDL-C is kept at <70 mg/dl, as defined as Optional goal for CAD and CAD risk equivalents, the success rates is only 31.5 %.
The primary target of therapy LDL-C<100 mg/dl is achieved in 4 out of 7 patients with high triglycerides (200-499 mg/dl). The secondary target of therapy Non-HDL cholesterol (The sum of VLDL+LDL cholesterol, calculated routinely as total cholesterol minus HDL cholesterol) <130 mg/dl is achieved in only 2 patients.

Table-III. Achievement (Target LDL-C<100mg/dl) rates among males and females

	Mean LDL-C levels	Number achieving target	Number not achieving target	% Achieving target
Males	81.13±19.87	60	16	79.7
Females	76.75±14.21	14	2	85%
Total	80.9±19.59	74	18	81.5%

Table-IV. Achievement (Target LDL-C<100mg/dl) rates among Statin groups

	Mean LDL-C levels	Number achieving target	Number not achieving target	% Achieving target
Atorvastatin group	81.57±19.98	54	15	78.2
Rosuvastatin group	80.6±19.49	17	3	85%
Simvastatin group	67.67±3.5	3	0	100%
Total	80.9±19.59	74	18	81.5%

IV. Discussion

The major trials for secondary prevention of CAD with statins were the Scandinavian Simvastatin Survival Study (4S)[6,10], Cholesterol and Recurrent Events (CARE) Study[7], and the Long-Term Intervention with Pravastatin in Ischemic Disease (LIPID) Study[11,12]. All three showed reductions in recurrent myocardial infarction and coronary death, coronary artery procedures, and stroke. Two of them also proved reduction in total mortality with statin therapy. Thus, secondary prevention trials provide strong evidence for the benefit of cholesterol-lowering therapy in persons with established CAD. LDL lowering has been shown to produce marked benefit regardless of gender, age, and the presence of diabetes, smoking, and hypertension. Furthermore, in CHD patients, LDL lowering decreases stroke rates[13], improves angina and myocardial perfusion and decreases the need for subsequent revascularization.

The Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III, or ATP III) presents the National Cholesterol Education Program's (NCEP's) updated recommendations for cholesterol testing and management. ATP-II emphasized on intensive LDL-lowering therapy in persons with established CAD. While ATP III maintains attention to intensive treatment of patients with CAD, its major new feature is a focus on primary prevention in persons with multiple risk factors. It also identifies new candidates to CAD risk equivalents and stresses on intensified therapeutic lifestyle changes. ATP-III recommends LDL cholesterol <100 mg/dl as optimal, defines low HDL cholesterol as <40 mg/dl. It also lowers the triglyceride classification cut points to give more attention to moderate elevations. There is a considerable improvement in success rates of target LDL-C level achievement over the past few years compared to earlier data where the success rates were unsatisfactory. Even though the success rate is significant in this facility, the study here is limited to in-patients only hence the results cannot be attributed to all CAD patients. Further larger, prospective, multi-centric trails involving both in-patients as well as Out-patients have to be conducted to draw a conclusion on significant achievement rates and CAD recurrence rates. The results such derived can be attributed to the entire country.

The major concern in this study is that even though the LDL-C levels are within the target range, many of the in-patients had recurrent CAD (Fig.1) requiring revascularisation.This leads to an opportunity to reconsider the target levels. Recent clinical trials have also recommended for re-examination of this goal.

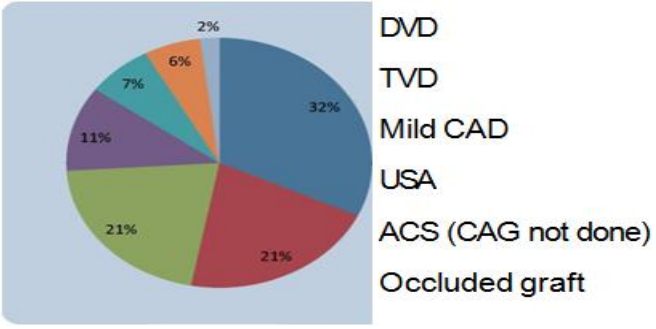

Figure 1 Type of CAD recurrence

There is no significant difference between achievement rates among the three statin groups, Atorvastatin, Rosuvastatin and Simvastatin. There is a need for comparative, prospective, cost benefit studies to look for the best Statin that suits Indian scenario.

Finally there should be emphasis on therapeutic lifestyle changes[14,15] along with pharmacological management of dyslipidemia in National program for prevention of CAD.

V. Conclusion

The dyslipidemia management in in-patients with known CAD of this cardiac care facility is satisfactory. Large multi-centric trials have to be conducted throughout India on in-patients as well as Out-patients to attribute the achievement rates to all CAD Patients in this country. It is also necessary to reconsider the target levels of lipid parameters to more lower values as many of the patients whose LDL-C levels are within the desired levels got admitted for recurrent CAD requiring revascularization. Prospective studies in this field would draw conclusion on the optimal levels of the target lipid parameters and also the role of non-lipid risk factors causing recurrence.

Reference List

[1]. Gupta R 2008. Recent trends in coronary heart disease epidemiology in India. Indian Heart J 60:B4-18.

[2]. Anand SS, Islam S, Rosengren A, Franzosi MG, Steyn K, Yusufali AH, Keltai M, Diaz R, Rangarajan S, Yusuf S 2008. Risk factors for myocardial infarction in women and men: insights from the INTERHEART study. Eur Heart J 29:932-940.

[3]. Pfefferkorn JA 2011. Novel 3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitors: a patent review. Expert Opin Ther Pat 21:187-203.

[4]. Aarabi M, Jackson PR 2007. Prevention of coronary heart disease with statins in UK South Asians and Caucasians. Eur J Cardiovasc Prev Rehabil 14:333-339.

[5]. Arca M, Gaspardone A 2007. Atorvastatin efficacy in the primary and secondary prevention of cardiovascular events. Drugs 67 Suppl 1:29-42.

[6]. Girman CJ, Rhodes T, Mercuri M, Pyorala K, Kjekshus J, Pedersen TR, Beere PA, Gotto AM, Clearfield M 2004. The metabolic syndrome and risk of major coronary events in the Scandinavian Simvastatin Survival Study (4S) and the Air Force/Texas Coronary Atherosclerosis Prevention Study (AFCAPS/TexCAPS). Am J Cardiol 93:136-141.

[7]. Shiffman D, Sabatine MS, Louie JZ, Kirchgessner TG, Iakoubova OA, Campos H, Devlin JJ, Sacks FM 2010. Effect of pravastatin therapy on coronary events in carriers of the KIF6 719Arg allele from the cholesterol and recurrent events trial. Am J Cardiol 105:1300-1305.

[8]. Pedersen TR, Olsson AG, Faergeman O, Kjekshus J, Wedel H, Berg K, Wilhelmsen L, Haghfelt T, Thorgeirsson G, Pyorala K, Miettinen T, Christophersen B, Tobert JA, Musliner TA, Cook TJ 2004. Lipoprotein changes and reduction in the incidence of major coronary heart disease events in the Scandinavian Simvastatin Survival Study (4S). 1998. Atheroscler Suppl 5:99-106.

[9]. 2002. Third Report of the National Cholesterol Education Program
(NCEP) Expert Panel on Detection, Evaluation, and Treatment of High
Blood Cholesterol in Adults (Adult Treatment Panel III) final report.
Circulation 106:3143-3421.

[10]. Pedersen TR 1998. Coronary artery disease: the Scandinavian Simvastatin Survival Study experience. Am J Cardiol 82:53T-56T.

[11]. Homma Y 2001. [LIPID study [Long-term Intervention with Pravastatin in Ischaemic Disease study]]. Nihon Rinsho 59 Suppl 3:416-421.

[12]. Tonkin AM 1995. Management of the Long-Term Intervention with Pravastatin in Ischaemic Disease (LIPID) study after the Scandinavian Simvastatin Survival Study (4S). Am J Cardiol 76:107C-112C.

[13]. Arrospide A, Mar J, Vivancos-Mora J, Rejas-Gutierrez J, Caro J 2010. [Cost-effectiveness analysis of using high doses of atorvastatin for the secondary stroke prevention in Spain]. Rev Neurol 51:1-11.

[14]. Muniz J, Gomez-Doblas JJ, Santiago-Perez MI, Lekuona-Goya I, Murga-Eizagaetxebarria N, de Teresa-Galvan SSE, Cruz-Fernandez JM, Castro-Beiras A 2010. The effect of post-discharge educational intervention on patients in achieving objectives in modifiable risk factors six months after discharge following an episode of acute coronary syndrome, (CAM-2 Project): a randomized controlled trial. Health Qual Life Outcomes 8:137.

[15]. Maron DJ, Boden WE, O'Rourke RA, Hartigan PM, Calfas KJ, Mancini GB, Spertus JA, Dada M, Kostuk WJ, Knudtson M, Harris CL, Sedlis SP, Zoble RG, Title LM, Gosselin G, Nawaz S, Gau GT, Blaustein AS, Bates ER, Shaw LJ, Berman DS, Chaitman BR, Weintraub WS, Teo KK 2010. Intensive multifactorial intervention for stable coronary artery disease: optimal medical therapy in the COURAGE (Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation) trial. J Am Coll Cardiol 55:1348-1358.

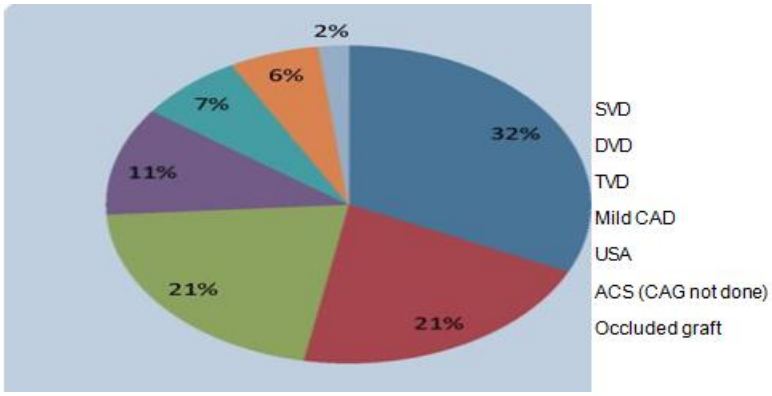

Figure 1 Type of CAD recurrence