

Prescription Patterns of Hypolipidaemic Drugs in a Tertiary Care Teaching Hospital of Southern India

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ABSTRACT

Objective: To evaluate the prescribing patterns of hypolipidaemic drugs which were prescribed to patients who visited the department of General Medicine in a tertiary care teaching hospital of southern India.

Materials and Methods: A cross-sectional study was done for three months in the department of General Medicine. A total of 506 prescriptions of hypolipidaemic drugs were evaluated, based on the various inclusion and exclusion criteria. The different disease patterns, the types of drugs which were prescribed in those diseases and the WHO prescription indicators, Anatomical Therapeutic Classification as well as the PDD (prescribing daily dose) /DDD (daily defined dose) ratio were calculated.

Results: While analyzing the prescriptions, it was found that patients having abnormal lipid profiles (56.9%) and normal

lipid profiles (43.1%) were prescribed hypolipidaemic drugs. Diabetes with hypertension (37%) was the most common disease for which hypolipidaemic drugs were prescribed. The average number of drugs per prescription was 3.3 ± 1.33 . Atorvastatin was the most common hypolipidaemic drug which was prescribed as monotherapy (53.4%), whereas atorvastatin with aspirin was the most common drug which was prescribed as combination therapy (20%). Atorvastatin was prescribed as underdosed and Rosuvastatin was prescribed as overdosed.

Conclusion: This study depicts the use of statins in various disease conditions, both as primary and secondary preventive measures. Such studies should be done to educate the physicians on good prescribing practices and on rational use of hypolipidaemic drugs.

Keywords: Drug utilization, Statins, Hypolipidaemic drugs

INTRODUCTION

Hyperlipidaemia is one of the major risk factors which is associated with atherosclerosis and atherosclerosis – induced conditions, such as coronary heart disease, ischaemic cerebrovascular disease and peripheral vascular disease. World Health Organization (WHO) has reported that approximately 60% of Indians will be affected by cardiovascular diseases by 2020 [1]. Due to obesity and high glycaemic load with insulin resistance, hypertriglyceridaemia is becoming more prevalent in Indian population, which makes India one of the global leaders with burden of diabetes mellitus [2]. Risk of coronary heart disease is higher in patients with diabetes. Moreover, diseases of the circulatory system have been common causes of death. Abnormal levels of blood lipids, impaired fasting glucose, elevated blood pressure and excess abdominal obesity lead to metabolic syndrome [3]. There is a need for adequate control of hypercholesterolaemia. Lipid lowering agents are the second most common pharmacological agents which are prescribed for patients with metabolic syndrome [4]. Drug utilization studies are very essential for evaluating and analyzing the drug therapy from time to time, to observe the prescribing patterns of general physicians, with the aim of validating the use of drugs and minimizing the adverse drug reactions [5]. Hence, this study intended to evaluate the prescribing patterns of hypolipidaemic drugs in the General Medicine Department of a teaching hospital.

MATERIALS AND METHODS

This cross-sectional study was conducted in the General Medicine Outpatients Department of a tertiary care teaching hospital of south India. After obtaining the approval of Institutional Ethics Committee, this study was conducted for a period of 3 months (June 2012 to August 2012). The prescriptions of patients who attended the outpatients department were noted down after obtaining verbal consents from them. Patients of both genders and who were in age

group of 30 years and above, who were prescribed with at least one hypolipidaemic drug, were included in the study. Patients who were below the age of 30 years and who did not receive a single hypolipidaemic drug were excluded from the study. Based on the inclusion and exclusion criteria, a total of 506 patients' prescriptions were selected for the study. The prescriptions given during the follow up visits were generally regarded as same prescriptions. However, in case another hypolipidaemic drug was added or if there was a change in any hypolipidaemic drug; then they were regarded as different prescriptions.

The selected prescriptions were analyzed for different factors such as the disease patterns, the types of hypolipidaemic drugs which are prescribed for those diseases, the prescribing daily dose (PDD) of the hypolipidaemic drugs and the PDD/DDD ratios of the drugs. The Anatomical Therapeutic Chemical (ATC) classification and the daily defined dose (DDD) of the hypolipidaemic drugs were found to be, as outlined by World Health Organization. The ATC codes and the daily defined doses for some fixed dose combinations of hypolipidaemic drugs were mentioned with consultation with the WHO. The official DDDs or the ATC codes were not defined for these combination products by World Health Organization. So, an unofficial or local DDD was assigned to each one of these combination products, as was suggested by the WHO collaborating centre for drug statistic methodology. The daily defined dose (DDD) is the average dose of the drug which is used for its main indication in adults and the prescribing daily dose (PDD) is the average dose which is prescribed according to the number of prescriptions and it gives the amount of drug that is actually prescribed. For each prescription, there were multiple doses of hypolipidaemic drugs and the PDD was calculated as the average of the daily doses for the hypolipidaemic drugs. Then, the PDD/DDD ratio was calculated to know the adequacy of dosing. Descriptive tables were generated and appropriate proportions were calculated.

RESULTS

During the study period, out of 6112 prescriptions, a total of 506 prescriptions had hypolipidaemic drugs. There was an equal gender distribution of the patients who received hypolipidaemic drugs. The average ages of the male and female patients who were prescribed hypolipidaemic drugs were 55.28±9.9 years and 56.14±11.4 years respectively.

The distribution of the disease pattern with lipid profile for which hypolipidemic drugs were prescribed has been shown in [Table/Fig-1]. The hypolipidaemic drugs which were prescribed for different disease conditions belonged mainly to single agents (statins, fibric acid derivatives) or to fixed dose combinations (statin with aspirin,

Diseases	No of prescriptions		Normal lipid profile		Abnormal lipid profile	
	n	%	n	%	n	%
Diabetes alone	87	17.2	35	6.9	52	10.3
Diabetes with hypertension	187	37	86	17.0	101	20.0
Diabetes with CAD	112	22.1	48	9.5	64	12.6
Diabetes with CKD	29	5.7	12	2.4	17	3.4
Diabetes with CVA	14	2.8	6	1.2	8	1.6
Hypertension alone	11	2.2	3	0.6	8	1.6
Hypertension with comorbid conditions	38	7.5	15	3.0	23	4.5
Others	28	5.5	13	2.6	15	3.0
Total	506	100	218	43.1	288	56.9

[Table/Fig-1]: Lipid profile of the patients prescribed with hypolipidemic drugs
Comorbid conditions like coronary heart disease(CAD), cerebrovascular disease(CVA), chronic kidney disease(CKD) etc

Hypolipidemic drugs	Diabetes alone		Diabetes with comorbid		Hypertension alone		Hypertension with comorbid		Others		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Statins												
Atorvastatin	40	7.9	165	32.6	9	1.8	33	6.5	23	4.54	270	53.4
Rosuvastatin	1	0.2	40	7.9	1	0.2	03	0.6	05	0.98	50	9.9
Fibric acid derivatives												
Fenofibrate	02	0.4	04	0.8			1	0.2			7	1.4
Fixed dose combination												
Atorvastatin with aspirin	33	6.5	67	13.2	1	0.2					101	20.0
Atorvastatin with ramipril	2	0.4	18	3.6			1	0.2			21	4.2
Atorvastatin with aspirin and ramipril	7	1.4	27	5.3							34	6.7
Atorvastatin with fenofibrate	2	0.4	21	4.2							23	4.5

[Table/Fig-2]: Distribution of hypolipidemic drugs in different disease conditions
Percentage (%) is calculated out of 506 prescriptions

Drugs	ATC Code	PDD	DDD	PDD/DDD
Atorvastatin	C10AA05	15.92	20	0.79
Rosuvastatin	C10AA07	16.4	10	1.64
Fenofibrate	C10AB05	160	160	1
Atorvastatin with aspirin	C10BX	20	20	1
Atorvastatin with ramipril	C10BX	1UD	1UD	1
Atorvastatin with aspirin and ramipril	C10BX	1UD	1UD	1
Atorvastatin with fenofibrate	C10BA	1UD	1UD	1

[Table/Fig-3]: ATC/DDD classification with PDD/DDD ratio of the prescribed hypolipidemic drugs
UD: Unit dose, PDD: Prescribing daily dose, DDD: Daily defined dose

statin with ACE inhibitors etc.). The prescribing patterns of these drugs for different diseases have been depicted in [Table/Fig-2].

Different WHO prescription indicators were observed. The average number of drugs per prescription was 3.3±1.33 and 35.37% of the fixed dose combinations were prescribed. There was not a single drug which was prescribed by its generic name. The hypolipidaemic drugs which were prescribed from National List of Essential Medicines of India (NLEM, 2011) was 53.35%, but not a single drug

was prescribed from the Essential Medicine List (17th EML of WHO). The ATC coding, DDDs (daily defined doses) of the prescribed hypolipidaemic drugs and PDD/DDD ratios were determined for each drug. Atorvastatin was prescribed as underdosed (PDD/DDD < 1) and Rosuvastatin was prescribed as overdosed (PDD/DDD > 1), as has been shown in [Table/Fig-3].

DISCUSSION

Many studies have been carried out on the drug utilization patterns of individual hypolipidaemic drugs such as statins in many developed and developing countries [6]. India is becoming the global epicentre for various diseases like diabetes and

cardiovascular diseases. So, there is a need to curtail the risk factors as well as to formulate appropriate treatment guidelines for these diseases. The main objective of the present study was to evaluate the drug utilization patterns of hypolipidaemic drugs which were prescribed for various diseases.

On observation, it was revealed that there was an equal distribution of the prescribed hypolipidaemic drugs in both the sexes. This indicated that there was an increase in prevalence of dyslipidaemia among Indian women. Previous studies have also suggested that the prevalence of coronary heart disease in Indian women was as high as that seen in men [7,8]. Our study showed higher number of patients in age group of 45 to 60 years, with a mean age of 55.71 years. Lisha et al., observed that the prevalence of diabetes, hypertension and other dyslipidaemia conditions were higher above age of 45 years [9].

Also, it was found that hypolipidaemic drugs were prescribed mostly to dyslipidaemia patients as well as to normal lipid profile patients. A majority of the patients who were prescribed hypolipidaemic drugs had diabetes with other comorbid conditions. This may be due to the fact that these prescriptions were analyzed at a tertiary care hospital, which was a referral centre for a large population.

The results also revealed that hypolipidaemic drugs were prescribed for these disease conditions, irrespective of the lipid profile statuses of the patients. This may be the strategy for primary as well as secondary preventions of cardiovascular complications which were at par with the latest National Cholesterol Education Programme guidelines [10].

Statins were the most common prescribed hypolipidaemic drugs. The prescription of a single hypolipidaemic drug was common. The choice of the statin as monotherapy or as a combination drug with aspirin, ACE inhibitors (ramipril) or fibrates, was based on the disease process. Among the statins, atorvastatin was used as a major hypolipidaemic drug. Also, it was seen that atorvastatin was preferred as a single hypolipidaemic agent. The combination of atorvastatin with aspirin was prescribed mainly for diabetes with comorbid diseased patients. The other fixed dose combinations of atorvastatin were limited to diabetes mostly. Several studies have shown that statins were the first line lipid lowering drugs used for primary as well as secondary preventions of coronary artery diseases (CAD) [11]. The other hypolipidaemic, fibric acid derivatives were preferred to be prescribed along with atorvastatin in diabetic patients.

Rational prescribing pattern was followed as the principle of prescription writing [12]. There was no polypharmacy, because there were no prescriptions which did not match the diagnoses and there were no prescriptions with more than five drugs [13]. There was not a single drug which was prescribed by its generic name, which may be due to lack of awareness or absence of safe prescribing guidelines [14]. So, the prescribing physicians should be informed about the importance of prescribing generic drugs. But the percentage of drugs which were prescribed from the National list of Essential Medicines of India (2011) was satisfactory.

The ATC (anatomical, therapeutic, chemical) classification of drugs is done as per their chemical, pharmacological and therapeutic properties [13]. The ratio of PDD to DDD gives an idea about the adequacy of dosing. A ratio of less than 1 indicates underdosing, whereas a ratio of more than 1 indicates overdosing. In this study, it was found that atorvastatin was prescribed as underdosed. A number of studies done on underutilization of statins have been reported [15,16]. Although the use of statins has increased many fold over the past, they are still underused. The reason for this underuse has been poorly explained. In clinical practice, statins are prescribed at lower doses with intention of titrating them upwards to higher doses, which has a reduced risk of cardiovascular effects. But it is not clear whether the doses were titrated upwards after initial dosing. This may be due to the lack of awareness of the physician or due to the noncompliance of the patients to the use of statins [17]. The other statin i.e. Rosuvastatin was overdosed. All other hypolipidaemic drugs which had a PDD to DDD ratio which was equal to one reflected the adequacy of dosing.

CONCLUSION

As this study was focussed on the prescription patterns of hypolipidaemic drugs, certain points can be highlighted. Diabetes

with comorbid diseases was the most common condition for which hypolipidaemic drugs were prescribed. Statin group of drugs and mostly, atorvastatin, is prescribed very commonly for diseases like diabetes, hypertension, coronary artery disease, etc. Still, there are some irrational prescribing practices among physicians. So, there is a need to improve utilization of hypolipidaemic drugs as well as rational prescribing practices by improving physician and patient education.

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