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Original Research Article

Prescribing trends of HMG Co-A reductase inhibitors in outdoor patients at tertiary care teaching hospital of central India: a retrospective observational study

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ABSTRACT

Background: To analyze the prescribing patterns of statins a hypolipidemic agents by using HMIS database in outdoor patients at tertiary care teaching hospital of central India.

Methods: In this retrospective study Using HMIS database, 1000 prescriptions were analyzed for statin use for various WHO prescription indicators using ATC code of statins, the ratio of prescribed daily dose (PDD) and defined daily dose (DDD) was calculated.

Results: Atorvastatin was the only statin which was prescribed as monotherapy (61.1%), whereas as combination with aspirin (38.9%). While analyzing the prescriptions, it was found that patients having abnormal lipid profiles (51.8%) and normal lipid profiles (48.2%) were prescribed atorvastatin. Hypertension with diabetes (37%) was the most common disease followed by hypertension (21.2%) and diabetes mellitus (21%) for which atorvastatin was prescribed. The average number of drugs per prescription were 3.8±1.65.

Conclusions: This study depicts the use of atorvastatin in various disease conditions, both as primary and secondary preventive measures. There was no polypharmacy. Such studies should be done to educate the physicians on good prescribing practices and to rationalize use of hypolipidemic drugs.

Keywords: Atorvastatin, Dyslipidemia, HMG Co-A inhibitors, Prescription Pattern

INTRODUCTION

Coronary heart disease accounts for approximately one-third of global deaths in recent years.[1] World Health Organization (WHO) has reported that approximately 60% of Indians will be affected by cardiovascular diseases by 2020.[2] Fundamental lifestyle changes and several medications have been recommended to control blood cholesterol. Among all medicines, 3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitors, or statins, are a major drug class given their efficacy in reducing LDL-C.[3-5] On average, administration of statins helps to lower LDL-C by 20% to 60%.[6-8] In addition to lowering cholesterol, statins are shown to decrease risk of coronary events by 18%, myocardial infarction by 24% and heart failure by 35%.[9] Statins are recommended by major clinical guidelines as the drug of choice for reduction of blood lipids to prevent CVD globally.[3-5]

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.[10] Hence, this study was planned to evaluate the prescribing patterns of HMG-CoA reductase inhibitors at tertiary care hospital.

METHODS

This was a retrospective observational study conducted in pharmacology department of tertiary care hospital. After obtaining clearance from ethical committee of institute, Data of 1000 short case file containing prescription of statins during the period from January 2015 to December 2015, were reviewed and retrieved from HMIS (Hospital Management-Information System) online database of Government Medical College, Akola.

Patients of both genders and who were in age group of 30 years and above, prescribed with at least one statin, were included in the study. Patients who were below the age of 30 years and who did not receive a single statin were excluded from the study. The prescriptions given during the follow up visits were generally regarded as same prescriptions. The selected prescriptions were analyzed for different factors such as the disease patterns, the type of statin which were prescribed for those diseases, prescribed daily dose (PDD) of statins, PDD/DDD ratio of drugs.

RESULTS

In this study atorvastatin was prescribed in moderate intensity dose (10mg or 20mg), more to males (56.8%) than females (43.2%).[3,11] The mean age ±SD for males and females was 64.16±9.66 and 61.84±10.07 respectively as

shown in Table 1. Atorvastatin was the only statin prescribed at tertiary care hospital. Atorvastatin was given either alone in a dose of 10 mg (in 597 patients) and 20 mg (in 403 patients) or in combination with Aspirin in a dose of 10 mg (in 389 patients out of 1000), as shown in Table 2 and 3.

Table 1: Age and sex distribution of patients on atorvastatin.

Gender	Mean age±SD	Percentage (%)
Male	64.16±9.66	56.8%
Female	61.84±10.07	43.2%

Table 2: Dose distribution of atorvastatin.

Dose of Atorvastatin	No. of patients	Percentage
10mg	597	59.7
20mg	403	40.3
Mean dose: 13.91mg±4.89		

The ATC coding, DDDs (defined daily doses) of atorvastatin and atorvastatin plus aspirin and PDD/DDD ratios were determined. Both were prescribed underdosed as shown in Table 3.

The distribution of the disease pattern with lipid profile for which atorvastatin was prescribed has been shown in Figure 1. It was observed that hypertension with diabetes (37%) was most common disease followed by hypertension (21.2%) and diabetes mellitus (21%) for which atorvastatin was prescribed.

Table 3: Prescription pattern of atorvastatin and ATC/DDD classification with PDD/DDD ratio.

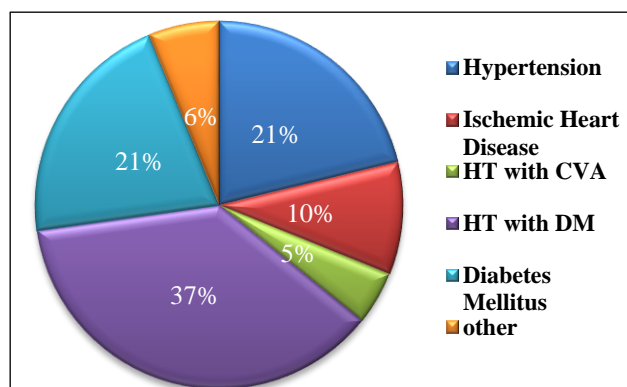| Drugs prescribed	No. of patients	%	ATC Code	DDD (WHO)	PDD	PDD/DDD	Adequacy of Dose
Atorvastatin Alone	611	61.1	C10AA05	20	13.91	0.695	Under dosed
Atorvastatin plus Aspirin	389	38.9	C10BX	20	10	0.5	Under dosed

Figure 1: Disease pattern for which statin was prescribed.

Figure 2 shows percentage of other drugs which were prescribed along with atorvastatin and was found that antidiabetic drugs (92.3%) were most commonly prescribed class of drug followed by antihypertensive drugs.

Table 4 shows WHO core drug prescribing indicators, there was 100% prescriptions was with generic name.

DISCUSSION

Atorvastatin was the most commonly prescribed statin at this tertiary care hospital. In other countries, atorvastatin has been one of the most commonly used statins.[12-14] On observation, it was revealed that there were 56.8% males and 43.2% females who were prescribed statins, our

findings were similar to study done by Patel KP et al.[15] Maximum number of patients (49.62%) who were prescribed statin were in age group of 61-70 years. Another study showed maximum number of males were in age group of 60-70 years and females in age group of 50-60 years.[16] A majority of the patients who were prescribed atorvastatin had hypertension with diabetes (37%) followed by hypertension (21.2%), diabetes Mellitus (21%) and other comorbid conditions. This may be due to the fact that these prescriptions were analyzed at a tertiary care hospital, which was a referral center for a large population, the results also revealed that statin were prescribed for these disease conditions, irrespective of the lipid profile status of the patients.
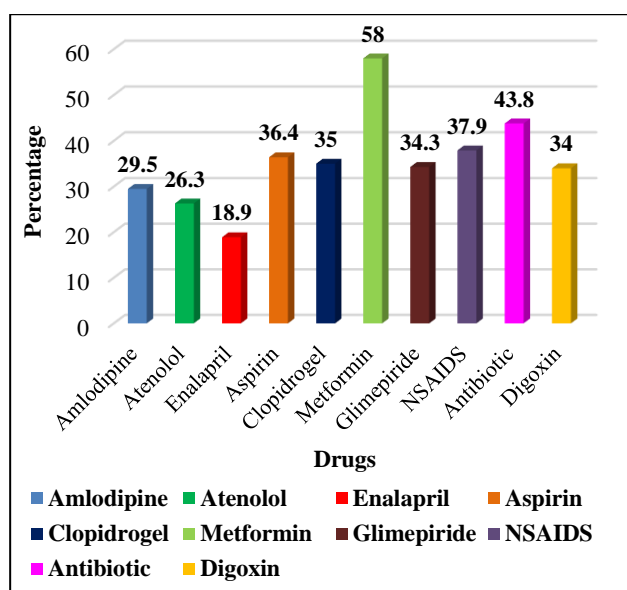

Figure 2: Concomitant drugs prescribed with atorvastatin.

Table 4: WHO core drug prescribing indicators.

Parameter	Mean (±SD)/%
Mean (±SD) number of drugs per prescription	3.8±1.65
Percentage of drugs prescribed by generic name	100
Percentage of encounters with antibiotic prescribed	23.8
Percentage of encounters with an injection prescribed	21.6
Percentage of drugs prescribed from WHO essential drug list	18.18

In this study, 48.2% patients had normal lipid profile and 51.8% had abnormal lipid values who were prescribed atorvastatin. This may be due to the strategy for primary as well as secondary preventions of cardiovascular complications which were as per with the latest National Cholesterol Education Programme guidelines.[17] Apart from atorvastatin, patients were prescribed calcium channel blocker (29.5%), beta blockers (26.3%), ACE inhibitors (18.9%), antiplatelet drugs (69.4%), oral

hypoglycemic drugs (93%), NSAIDS (37.9%) and antibiotics (23.8%). Use of concomitant drugs were lower in our study as compared to another study.[18]

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. 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 and combination of atorvastatin with aspirin was prescribed as underdosed. Other studies done on underutilization of statins have been reported.[19,20]

Limitation: As this was a retrospective observational study, data was collected from short case files, we could not find if patient were taking any other hypolipidemic drug along with atorvastatin due to lack of direct contact with patients or any change in prescription on follow up visits. The Prescribing indicators are less useful in speciality outpatient clinics in referral hospitals where the drug use pattern is more complex.

CONCLUSION

To conclude, this study has shown that polypharmacy was not there and most commonly used statins for diseases like hypertension, diabetes and ischemic heart diseases was atorvastatin as hypolipidemic drug. Drug utilization studies of this type may help in improving the quality of healthcare given to patients at tertiary care hospital.

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