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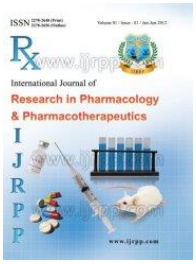

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Study on prescribing pattern and drug interactions of dyslipidemic agents in a tertiary care hospital

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ABSTRACT

Dyslipidemia is one of the major contributors to atherosclerosis and coronary heart disease in our society. Dyslipidemic drugs are widely used either for prophylaxis or treatment of dyslipidemia. HMG CoA reductase inhibitors (statins) are a widely used class of lipid lowering drugs, which are generally well-tolerated, with an acceptable side effect profile. They are the first line of therapy for lipid lowering and attaining ATP III goals.

The objective of the study is to determine the prescribing pattern and drug interactions of dyslipidemic agents in the selected study population as per the inclusion criteria. A prospective observational study was conducted. The data was collected during regular ward rounds and was analysed.

The prevalence of CVD was significantly higher (62%) in the study population. The majority of patients 144 (96%) were receiving lipid lowering therapy with statins and 5 (3.33%) patients were on combination therapy including a statin and fibrate and 1 (0.67%) patient was on fibrate alone. Atorvastatin is majorly prescribed in 137 (91.95%) patients followed by rosuvastatin in 12 (8.05%) patients. The drug interaction between dyslipidemic agents were analysed and categorized, there were 2 (1.55%) major, 125 (96.90%) moderate and 2 (1.55%) minor possible drug-drug interactions were found.

The results reveal that statins were prescribed more compared to other classes of dyslipidemic agents. Atorvastatin was the most commonly prescribed statin in the study site for the treatment of dyslipidemia. Atorvastatin utilization is significantly higher than rosuvastatin, even though recent studies describes that rosuvastatin is more efficacious and safe when compared to atorvastatin. Further studies may justify effectiveness of various statins.

Keywords: Dyslipidemia, Precribing patterns, Statins, Drug interactions

INTRODUCTION

Lipid-lowering agents such as Statins, Fibrates, Niacin, Omega-3 fatty acids etc. are prescribed for many cases in Cardiology practice like dyslipidemia, familial hypercholesterolemia and metabolic disorders [1, 2]. HMG CoA reductase inhibitors (statins) are a widely used class of lipid lowering drugs, and like all medications have potential for adverse effects (AEs). Muscle problems are the best known side effects of statins, but cognitive problems and memory loss are also widely reported. A spectrum of other problems, ranging from blood glucose elevations to tendon problems, can also occur. There is evidence that taking statins may even increase your risk for diabetes and cancer. Studies reveal that most of the people taking a statin, don't really need it [3].

Therefore, studies on the prescription pattern are needed to better support decision making processes. Study of prescribing pattern can give insight into trends in using drugs in dyslipidemia and in treating their comorbid conditions. Still, there are some irrational prescribing practices among physicians. So, there is a need to improve utilization of dyslipidemic drugs as well as rational prescribing practices by improving physician and patient education [4].

OBJECTIVES

The main objectives of our study was to evaluate the prescribing pattern and drug-drug interactions of dyslipidemic agents in the prescriptions.

METHODOLOGY

A prospective –observational study was conducted for duration of 6 months in a 750 bedded multi-specialty hospital located at South India. Regular ward rounds were carried out in the study department and each patient's medication profile was reviewed. A total of 150 patients were included according to inclusion criteria. A patient information form has been prepared, to inform the patient or the caregivers about the purpose and their consent was obtained. The data from medical chart were recorded in customized data entry form. The prescribed dyslipidemic drugs were evaluated and the prescribing pattern was identified and categorized. Other medication problems such as drug interactions were monitored and reported. The report on the study results was prepared and the same was submitted to the study department for necessary modification on future therapy for a safe and effective treatment.

RESULTS & DISCUSSION

A total of 150 patients were included in the study based on the inclusion and exclusion criteria, among them 110 (73.33%) were males and 40 (26.67%) were females. The age categorization was done for both males and females in the study population. Majority of male patients (55%) were in the age group of more than 65 years and majority of female patients (45%) were in the age group of 55-65 years. **[Table no: 1]**

Table No. 1: Age wise categorization

Age	Males		Females	
	No.of patients	Percentage (%)	No.of patients	Percentage (%)
25-35	4	3.63	3	7.5
35-45	15	13.65	3	7.5
45-55	17	15.45	6	15
55-65	19	17.27	18	45
>65	55	50	10	25

PREVALENCE OF CARDIOVASCULAR DISEASES

Among the study population 93(62%) patients were found to be suffering from CVD and 57 (38%) were non CVD patients. **[Fig. no: 1].** The various types of CVD in the study population were categorized, it was found that majority of them were diagnosed with MI 33 (35.48%), followed by Angina 25 (26.88%), Stroke 23 (24.73%) and CCF 12 (12.91%). **[Table no: 2]**. This result reveals that MI and Angina are the most common CVDs among study population. A similar study conducted **Abdul. M et al (2012)** [5] revealed that angina and MI are the major diseases suffered by their study population.

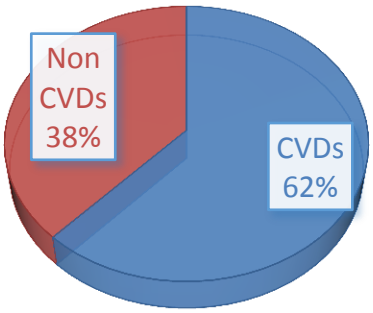

Fig. no. 1: Prevalence of CVDs

Table No. 2: Types of CVD

Types of CVDs	No.of patients	Percentage (%)
MI	33	35.48
Angina	25	26.88
Stroke	23	24.73
CCF	12	12.91

The total number of drugs prescribed for the study population was found to be 1353. A total of 197 (14.56%) anti-hypertensives, followed by 155 (11.45%) dyslipidemic agents, 147 (10.86%) PPIs, 127 (9.38%) antibiotics, 120 (9.46%) anti-coagulants and antiplatelets, 102 (7.53%) anti-diabetics, 90 (6.65%) anti-anginal, 79 (5.83%) anti-arrhythmias, 72 (5.32%) anti-emetics, 61 (4.50%) vitamin supplements, 38 (2.80%) corticosteroids, 33 (2.43%) NSAIDs, 15 (1.10%) anti-epileptics, 12 (0.88%) anti-diarrheal, 8 (0.55%) sedatives, 4 (6.41%) anti-psychotics and 93 (6.38%) others **[Table no: 3]**.

The drugs prescribed for dyslipidemia was analysed and it was found that statins were the most widely used drugs among study population. About 144 (96%) patients were on statins, 5 (3.33%) patients were on combination therapy including a statin and fibrate and remaining 1(0.67%) patient on fibrates alone. **[Table no: 4].** The results reveals that prescription of a single dyslipidemic drug was common in the study site. A study done by **Jean. F et al (2008)** [6] reports that most of the patients (90.4%) received a single lipid lowering drug. Among the study population, statins were prescribed more compared to other classes of dyslipidemic agents. Studies suggest that statins are the most efficient and better tolerated drug class for the treatment of dyslipidemia [15]. For this reason statins may be considered as the first line drugs in the most cases of dyslipidaemia. Thus the use of statins in majority of the patients at the study site is beneficial to the patients.

Table No. 3: Drugs Prescribed (N=1353)

Drug Class	Number (N)	Percentage (%)
Anti-hypertensives	197	14.56
Dyslipidemic agents	155	11.45
PPIs	147	10.86
Antibiotics	127	9.38
Antiplatelets and Anticoagulants	120	9.46
Anti-diabetics	102	6.65
Anti-anginal	90	6.65
Anti-arrhythmics	79	5.83
Anti-emetics	72	5.32
Vitamin supplements	61	4.50
Corticosteroids	38	2.80

NSAIDs	33	2.43
Anti-epileptics	15	1.10
Anti-diarrhoeals	12	0.88
Sedatives	8	0.55
Anti-psychotic's	4	0.29
Others	93	6.41

Table No. 4: Prescribing Pattern of Dyslipidemic Agents

Category of drugs	No. of Prescriptions	Percentage (%)
Statins	144	96
Fibrates	1	0.67
Statins and Fibrates	5	3.33

An attempt was made to categorize the statins prescribed in the study population. Atorvastatin was the most commonly prescribed statin in the study site and few patients were prescribed with rosuvastatin. About 137 (91.95%) patients received atorvastatin and 12 (8.05%) patients received rosuvastatin. **[Fig. no: 3]** A study conducted by **Sreedevi K et al (2011)** [7] also reiterates our findings and states that atorvastatin is prescribed more for the treatment of dyslipidemia. However recent studies suggest that rosuvastatin is more efficacious and safe when compared to atorvastatin [8]. Thus further studies are needed on comparing the efficacy, safety and cost comparison of atorvastatin vs rosuvastatin.

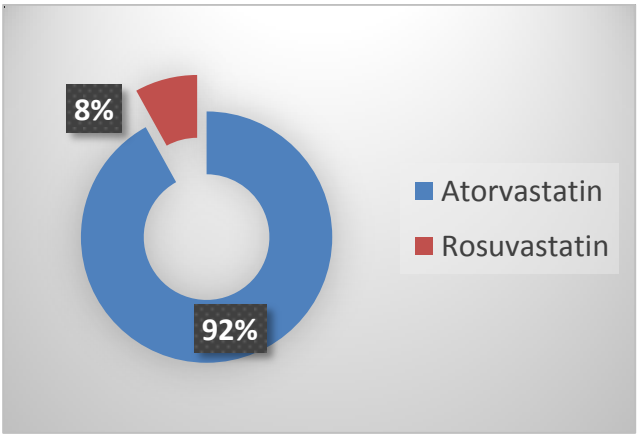

Fig. No: 2 Statin Utilization Pattern

DRUG INTERACTIONS INVOLVING DYSLIPDEMIC DRUGS

In the present study around 129 (86%) prescriptions had drug interactions. The drug interaction between dyslipidemic agents were analysed and categorized, there were 2 (1.55%) major, 125 (96.90%) moderate and 2 (1.55%) minor interaction possible drug-drug interactions identified in the prescriptions.

CONCLUSION

The study on prescribing pattern and drug interactions of dyslipidemic agents was successfully carried out. Most of the prescriptions containing dyslipidemic agents were found to be appropriate at the study site. Most of the inappropriate prescriptions were consisting dyslipidemic drugs irrespective of the patients lipid profile statuses. Reducing dyslipidemic agents use will prevent the adverse events associated with its use and also reduce cost involved with its use.

To conclude, the present study suggests that physician and clinical pharmacist should work together to achieve rational use of dyslipidemic agents. The irrational use of dyslipidemic agents must be prevented through proper interventions. The prescriptions must be thoroughly assessed for its rationality so that the quality, efficacy and safety of medical care can be improved.

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