A study on prescription pattern of statins in cardiovascular disease

Sreedevi K¹, Venkateswara Rao J¹, Fareedullah Md²* and Vijayakumar S²

¹Sultan-Ul-Uloom College of Pharmacy, Banjara Hills, Hyderabad, A.P
²Vagdevi College of Pharmacy, Hanamkonda, Warangal, A.P

ABSTRACT

Statins are effective in both primary and secondary prevention of coronary heart disease (CHD), and other conditions. The present study is mainly focused on prescription pattern of statins in cardiovascular disease. However, prescriptions were collected from out-patient departments visiting different hospitals of Hyderabad, Andhra Pradesh, India. A total of 1000 prescriptions were collected out, of which 306 were included with the statins and were used for further analysis. The results show that males were prescribed more on statins therapy compared to that of females. Whereas, predominant age groups in these patients were found to be 60-70 yrs in males and 50-60 yrs in females. In addition to that, co-morbidities conditions for which statins were prescribed are CVD (279), diabetes (199), thyroid disorders (25), Osteoporosis (5) and renal insufficiency (6). The different statins prescribed are Atorvastatin (261), Rosuvastatin (26), Simvastatin (12) and Lovastatin (7). Our article suggests that, statins are first-line agents in most situations. These drugs are cost-effective in secondary prevention and high-risk primary prevention risk groups.

Key words: Cardiovascular disease, Cholesterol, Secondary Prevention, Statins.

INTRODUCTION

It is well documented that safe and effective drug therapy mostly is possible only when patients are well informed about the medications and their use [1]. Every member of the healthcare team should practice rational drug therapy. Rational drug use means patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time and at the lowest cost to them and their community. [2] Confusion over brand names, overwhelming workload of doctors and pharmacists, cost factor, patient attitudes, erratic supply of drugs, lack of institutional formulary etc can lead to irrational use of drugs. Irrational drug use can lead to reduction in quality of drug therapy, increased risk of unwanted effects, drug resistance etc. The five important criteria for rational drug use are accurate diagnosis, proper prescribing, correct dispensing, suitable packing and patient adherence. The prescribers should make an accurate diagnosis and prescribe rationally and the pharmacist should
ensure that effective form of the drug reaches the right patient in prescribed dosage and quantity, with clear instructions on its appropriate use.

Elevated cholesterol levels are a proven risk factor for cardiovascular diseases (CVDs). Observational studies have provided consistent relationships between increased cholesterol and mortality, CVD, and decreased quality of life. The 3-hydroxy-3-methylglutaryl coenzyme A (HMG-CoA) reductase inhibitors (Statins) reduce atherogenesis and cardiovascular morbidity. These effects are attributed to alteration in cholesterol metabolism and reduction in low-density lipoprotein (LDL) formation [3]. Studies have shown that statins prevent first cardiac events in healthy persons with elevated LDL cholesterol and low levels of high-density lipoprotein cholesterol. Statins are also associated with a reduction in cardiac death, stroke, hospitalization, and the need for revascularization in patients with established coronary heart disease and hyperlipidemia. The use of statins for secondary prevention of cardiovascular events is commonly accepted in young and elderly patients. Apart from the protective role in CVD, statins are found to be effective in the treatment of Osteoporosis after it was discovered that they could activate the BMP-2 (Bone morphogenic protein-2), causing increased osteoblast proliferation and differentiation and consequently, enhanced bone formation [4].

Research continues into other areas where statins also appear to have a favorable effect, including Dementia [5], Nuclear Cataracts [6], Hypertension [7], Lung Cancer [8] and Prostate Cancer [9].

Although some clinicians may use statins for primary prevention of CVD, it is important to determine whether, from the totality of evidence to date, statins have a role in this population. Using a systematic review of the literature and meta-analytic techniques the present study is mainly focused on prescription pattern of statins in cardiovascular disease.

**MATERIALS AND METHODS**

In the present study, prescriptions were collected from out-patient departments visiting different hospitals of Hyderabad, Andhra Pradesh, India. World Health Organization (WHO) based prescription auditing proforma was used for data collection [10]. The prescriptions, which included hypolipidemic drugs (Statins) were audited and analyzed category-wise. Patients on statin therapy i.e., for treatment of hyperlipidemia or prophylaxis in stroke, cardiovascular diseases or other disorders like diabetes, hypothyroidism, and osteoporosis were included in our study.

**Analysis:** The filled encounter forms were analyzed for the age and gender distribution of patients, disease state, drug-drug interaction, average number of drugs per prescription and therapeutic category of drugs prescribed.

**RESULTS AND DISCUSSION**

A total of 1000 prescriptions were collected irrespective of disease state. Among these, prescriptions included with hypolipidemic drugs were 314. Prescriptions with Statins, excluding other hypolipidemic drugs were 306. Further analysis was performed on these 306 prescriptions containing statins.
Gender-wise distribution shows that males are prescribed more on statin therapy i.e., 61.5%, whereas, females are 38.5%. The Age criteria denoting the age group on high statin therapy in males is 60-70 yrs (48%) and in females 50-60 yrs (39%). Various disease states for which the statins have been prescribed is shown in Table 1.

Table 1: Various disease states in which the Statins were prescribed

<table>
<thead>
<tr>
<th>Disease Condition</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular diseases</td>
<td>139</td>
<td>107</td>
<td>279</td>
</tr>
<tr>
<td>Diabetes</td>
<td>128</td>
<td>71</td>
<td>199</td>
</tr>
<tr>
<td>Thyroid disorders</td>
<td>12</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Renal insufficiency</td>
<td>5</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>

All the prescriptions were analyzed for any drug-drug interactions and were not found. The average number of drugs per prescription was found to be 5.5. Rare prescriptions were observed with generic names of the drugs, many prescriptions especially of CVD were containing fixed dose combinations (FDC). The different statins that were prescribed is given in Table 2.

Table 2: Different Statins Prescribed

<table>
<thead>
<tr>
<th>Drugs</th>
<th>No. of Prescriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atorvastatin</td>
<td>261</td>
</tr>
<tr>
<td>Rosuvastatin</td>
<td>26</td>
</tr>
<tr>
<td>Simvastatin</td>
<td>12</td>
</tr>
<tr>
<td>Lovastatin</td>
<td>7</td>
</tr>
</tbody>
</table>

Prescribing pattern of drugs reflects the clinical judgment of the clinicians. The average number of drugs per prescription was found to be 5.5 in our study which is average in respect to that reported from studies conducted in Brazil (8.6), Ghana (3.6) and West Bengal, India (3.2) [11, 12, 13]. Lesser number of drugs is a positive sign as polypharmacy is known to be a contributing factor for hospitalizations [14]. Polypharmacy may also lead to drug interactions, adverse drug reactions and patient’s non-adherence. However, in certain conditions like cardiovascular problems, the patients may require more drugs.

In our study males are more on statins therapy compared to that of females which may be due to the contributing risk factors like smoking, alcohol intake, diet high in saturated fat, etc., seen commonly in males in India. Several secondary prevention trials have indicated that cholesterol-lowering therapy with statins reduces the numbers of coronary deaths and nonfatal myocardial infarctions [15, 16]. The benefits of statins for major clinical events is of clear importance to both the developing and the developed world, to both individual clinicians as well as policy makers, and across sex, age, and CHD history [17]. What seems to be of prime concern now is the appropriate use of statin therapy from a public health perspective [18].

In our study we have found that Atorvastatin is prescribed more. A recent study on “10 Best Selling Drugs” in US, reported by the Institute of Healthcare Informatics states that Lipitor (Atorvastatin) is the highest sold drug in US in 2010, with a sale of $7.2 billion [19].
CONCLUSION

Our article suggests that statins are first-line agents in most situations. There is a need for patient counseling regarding the side effects of statins and their interactions (Ex: Grape fruit juice). A less number of prescriptions were found with generic drugs. The practice of prescribing generic drugs should be encouraged which will be cost-effective for the patients as these drugs are used for long-term treatment.

REFERENCES