Analysis of Cost Variation of Hypolipidemics Drugs

Prasan R. Bhandari

Author affiliations
Department of Pharmacology, SDM College of Medical Sciences & Hospital, Dharwad 580009, Karnataka, India

Address reprint requests to
Dr. Prasan R. Bhandari
Department of Pharmacology, SDM College of Medical Sciences & Hospital, Dharwad 580009, Karnataka, India
Email: prasangeeta2012@gmail.com

Abstract:
Introduction: Indian pharmaceutical industry being one of the largest pharmaceutical markets in the world has a large number of branded formulations and generic brands of the same drug with a large difference in their selling price. The study was planned to find out variation in cost of oral hypolipidemic drugs.

Methods: Information was sourced from NETMED MOBILE APP. The drug formulation being manufactured by only one company or being manufactured by different companies; however, in different strengths would be excluded. Difference in the maximum and minimum price of the same drug formulation manufactured by different pharmaceutical companies and percentage variation in price would be calculated.

Results: The cost ratio’s and cost variation of all drugs including monocomponent drugs and fixed drug combinations (FDC’s) is above 100%. The maximum being Atorvastatin 20 mg in monocomponent drugs and Atorvastatin 10 mg + Fenofibrate 160 mg in FDC’s.

Conclusion: Thus, this study highlights that there is a significant price difference among the hypolipidemic drugs manufactured by different companies. Hence stringent measures should be brought into implementation by the government and concerned agencies for uniformity in drug pricing.

Key words: Cost-Analysis, Hypolipidemics, Analysis, Atorvastatin.

INTRODUCTION

Indian pharmaceutical industry being one of the largest pharmaceutical markets in the world has a large number of branded formulations and generic brands of the same drug with a large difference in their selling price. McKinsey and Co. have predicted that, India’s pharmaceutical market would reach a size of 20 billion USD by year 2015, which would have tremendous growth to become one of the top 10 pharmaceutical drug markets in the world.1

The difference in cost has affected consumers, prescribers and health-care providers regarding which is the best suitable branded and generic formulation. Variations in cost of drugs that are used very commonly in a large number of populations have large economic implications. This affects the compliance of the patients who need to take these drugs regularly to maintain good health.2

Furthermore, the health care providers, who prescribe these formulations, need to be aware of the costs incurred by patients. When there are hundreds of formulations available in the market of the same drug, price is one of the important factors in selecting, which formulation suits the best.

Cardiovascular disease (CVD) is the leading cause of mortality, and its prevalence is increasing worldwide. Important co-morbidities being hypertension, diabetes and smoking, hyperlipidemia is also a key contributor to CVD accounting for 55% of non-age-related risk. Despite extensive clinical research and more efficacious therapies, CVDs remain the leading...
cause of morbidity and mortality worldwide. In recent years, India and other developing countries have witnessed a rapidly escalating epidemic of CVD.[3]

Dyslipidemia is one of the risk factor for ischaemic heart diseases.[4] It is predicted that, by 2020, coronary heart disease will be the leading cause of death in adult Indians.5Previous studies estimated an average reduction of 11.5 years of life for complications arising as a consequence of CVD. This shows the importance of dyslipidemia as a risk factor, which led to the development of hypolipidemic drugs. With the development of hypolipidemic drugs namely statins, reduction has been found in CVD and mortality.[6-9]

Lipid-lowering therapy that has a long history of drug development, with the initial CVD outcomes studies performed in the 1970s. The earliest hypolipidemic drug niacin was discovered in 1955 while the bile acid sequestrants and fibrates were developed in 1960s. These drugs have been almost completely replaced by statins. Observational studies indicate a continuous positive association between the risk of CVD and low-density lipoprotein cholesterol levels.[10,11]

Currently available treatment guidelines consider statins as first-line lipid-lowering agents and other four classes of less commonly used second-line hypolipidemic drugs which include cholesterol absorption inhibitors, lipoprotein lipase activators (peroxisome proliferator-activator receptor α activators/fibrates), niacin preparations and bile acid sequestrants (resins).[12]

With updated 2013 guidelines for the treatment of high blood cholesterol by the American College of Cardiology/American Heart Association, the use of statins and other drugs is expected to increase further.[13]

Drug Price Control Order (DPCO) is an order issued by the Indian government to fix prices of drugs. Once any medicine is brought under purview of DPCO, it cannot be dispensed at a price higher than that fixed by the government. In India over the years number of the drugs under DPCO has decreased. Due to this cost of therapy has increased tremendously and put an economic burden on the poor population of India. As per the recent amendments, National Pharmaceutical Pricing Authority revised the prices of 418 drugs vide DPCO, April 2014. Amongst the statins only Atorvastatin has been included in the new list of essential medicines while other hypolipidemic drugs are not included in this list.[14-16]

It was noted, that percentage increase in price of drugs under DPCO was less than those drugs that are not under the purview of DPCO.[17]

The study was planned to find out variation in cost of oral hypolipidemic drugs like HMG Co-A reductase inhibitors (Statins), peroxisomal proliferator-activating receptor agonists (fibrates), sterol inhibitors, lipoprotein and triglyceride inhibitors available in India either as a single drug or in combination and to evaluate the difference in cost of various brands of same oral hypolipidemic drug by calculating the percentage variation in cost in Indian rupees (INR).

METHODS
1. Initially it was decided that the price in INR of oral hypolipidemic drugs manufactured by different pharmaceutical companies in India, in the same strength would be obtained from “Current Index of Medical Specialties”.
2. However, after scanning some similar literature it was observed that one of the major limitations of such studies was that, sources of information were limited to CIMS. But there are few other brands which are marketed in India but not published in the above-mentioned source.
3. Hence going by the explosion of online pharmacies it was decided to obtain the information from these sources. They would provide the current prices.
4. After scouting numerous online pharmacies and drug price webpages of India such as medguideindia, netpharmacy, 1mg.com, medicineindia, drug, drugtodayonlineindia.com, CIMS (online version); it was personally observed that the ease of obtaining the data was best with netmeds app. One could filter the prices of medicines as desired from low to high or vice versa. One could even remove the out of stock medicines.
5. Hence the information was sourced from NETMED MOBILE APP.
6. The drug formulation being manufactured by only one company or being manufactured by 
different companies; however, in different strengths would be excluded.
7. Cost of the oral hypolipidemic drug formulation would be calculated for an average of 1 UNIT 
(tables/CAPSULES).
8. Difference in the maximum and minimum price of the same drug formulation manufactured 
by different pharmaceutical companies and percentage variation in price would be calculated.
9. Percentage cost variation would be calculated as follows:

\[ \% \text{ Cost variation} = \frac{\text{Maximum cost} - \text{Minimum cost}}{\text{Minimum cost}} \times 100 \]

10. The cost ratio i.e. the ratio between the maximum and minimum cost of the same generic 
oral hypolipidemic drug would be calculated as follows:

\[ \text{Cost ratio} = \frac{\text{Maximum cost}}{\text{Minimum cost}} \]

**STATISTICAL ANALYSIS**
The findings of our observational study would be expressed as absolute numbers and 
percentages.

**RESULTS**
As can be seen from the results in table 1 and figures 1-6, the cost ratio's and cost variation of all 
drugs including monocomponent drugs and fixed drug combination (FDC’s) is above 100%. The 
maximum being Atorvastatin 20 mg in monocomponent drugs and Atorvastatin 10 mg + 
Fenofibrate 160 mg in FDC’S.

Table 1 Maximum price, minimum Price, cost ratio, S and cost variation In monocomponent drugs and F.D.C’s.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Maximum Price (INR)</th>
<th>Minimum Price (INR)</th>
<th>Cost ratio = Maximum price/Minimum price</th>
<th>Cost variation = Maximum price - Minimum price * 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atorvastatin 10 mg</td>
<td>66</td>
<td>20</td>
<td>3.30</td>
<td>230</td>
</tr>
<tr>
<td>Atorvastatin 20 mg</td>
<td>140</td>
<td>20</td>
<td>7.00</td>
<td>600</td>
</tr>
<tr>
<td>Atorvastatin 40 mg</td>
<td>203</td>
<td>81</td>
<td>2.51</td>
<td>150.62</td>
</tr>
<tr>
<td>Atorvastatin 80 mg</td>
<td>532</td>
<td>118</td>
<td>4.51</td>
<td>350.85</td>
</tr>
<tr>
<td>Simvastatin 5 mg</td>
<td>78</td>
<td>62</td>
<td>1.26</td>
<td>25.81</td>
</tr>
<tr>
<td>Rosuvastatin 5 mg</td>
<td>131</td>
<td>32</td>
<td>4.09</td>
<td>309.38</td>
</tr>
<tr>
<td>Rosuvastatin 10 mg</td>
<td>170</td>
<td>40</td>
<td>4.25</td>
<td>325.00</td>
</tr>
<tr>
<td>Rosuvastatin 20mg</td>
<td>480</td>
<td>77</td>
<td>6.23</td>
<td>523.38</td>
</tr>
<tr>
<td>Rosuvastatin 40mg</td>
<td>562</td>
<td>110</td>
<td>5.11</td>
<td>410.91</td>
</tr>
<tr>
<td>Atorvastatin 10mg + Fenofibrate 160mg</td>
<td>+ 198</td>
<td>48</td>
<td>4.13</td>
<td>312.50</td>
</tr>
<tr>
<td>Atorvastatin 10mg + Ezetimibe 10mg</td>
<td>+ 228</td>
<td>81</td>
<td>2.81</td>
<td>181.48</td>
</tr>
<tr>
<td>Rosuvastatin 10mg + Fenofibrate 160mg</td>
<td>356</td>
<td>132</td>
<td>2.70</td>
<td>169.70</td>
</tr>
<tr>
<td>Rosuvastatin 10mg + Ezetimibe 10mg</td>
<td>+ 270</td>
<td>108</td>
<td>2.50</td>
<td>150.00</td>
</tr>
</tbody>
</table>

*INR= Indian rupees.
Fig. 1 Comparison between maximum and minimum price of monocomponent drugs (INR).

Fig. 2 Cost ratio’s of monocomponent drugs.
Fig. 3 Cost Variation of monocomponent drugs.

Fig. 4 Comparison of maximum price and minimum price of FDC's.

Fig. 5 Cost ratio's of FDC's.
DISCUSSION

The present study showed a very high variation in the maximum and minimum price of hypolipidemic agents. The percentage variation in the cost was above 100% with most of the drugs and there is substantial variation in the cost of different brands of same hypolipidemic agents in Indian market which is consistent with the results from previous studies. Medication compliance is more important in chronic disorders and the cost of the prescribed drugs is one of the factors which decide drug compliance.[18,19] Higher medication costs are one of the major reasons for medication non-adherence which has been associated with adverse health outcomes such as treatment failure. This result in progression of the disorder thus enhances the medical care costs considerably. Prescribing physicians should pay attention to the drug prices in a country like India whereas huge percentage of patients are paying themselves for their medical bills and are not covered by insurance schemes.

Health insurance in India principally covers hospitalization and not out-patient or domiciliary care. Out-patient healthcare spending in India has augmented by almost fifty percent in the last 10 years. As per the data obtained from the prescribing pattern studies, prescribing with the brand name is more prevalent. Prescribing by generic names provides flexibility to the patient in deciding the brand that they can afford as generic drugs are in no way inferior to the costlier branded counterpart. Thus, there is a pressing need to create awareness to the health care providers about cost variation and its associated consequences.

It has been observed that doctors have suboptimal awareness of drug cost. In such situation if costly brands are prescribed patients has to pay unnecessarily more money and that creates an economic burden and can affect the compliance on the patient counterpart. The situation can be improved if drug cost is given greater emphasis during medical training program of doctors.

Presently, a limited number of drugs are under drug prices control order. Government should get higher number of drugs under price control. Drug Price Control Order (DPCO) and the National Pharmaceutical Pricing Authority (NPPA) are effective tools for regulation of drug prices.[20,21]

CONCLUSION

Thus, this study highlights that there is a significant price difference among the hypolipidemic drugs manufactured by different companies. Hence stringent measures should be brought into implementation by the government and concerned agencies for uniformity in drug pricing.
Majority of these medications are being prescribed on an out-patient basis, which was not covered under most of the insurance program. Self expenditure unfavourably disturbs the drug compliance in the long run. There must be a wide-ranging action from policymakers, regulatory authorities, government agencies, doctors, pharmacists, and the general public to solve this issue of cost variation of drug.

REFERENCES
Conflicts of Interest: No conflict of interest.

**Statement of originality of work:** The manuscript has been read and approved by all the authors, the requirements for authorship have been met, and that each author believes that the manuscript represents honest and original work.

**Source of support:** Nil

**Disclaimer:** Any views expressed in this paper are those of the authors and do not reflect the official policy or position of the Department of Defense.