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RESEARCH ARTICLE

PHARMACOECONOMIC SCENARIO OFHYPOLIPIDEMIC DRUGS IN THE INDIAN MARKET

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ABSTRACT

Hyperlipidemia can be inherited and increases the risk of disease of the blood vessels leading cardiovascular events and requiring lifelong therapy. Hence the cost of medication plays an important in patient care arising the need for all physicians to keep oneself updated regarding latest prices and price variation of various brands of hypolipidemic drugs. Objective: To analyze the cost variation of hypolipidemic drugs in Indian market. **Materials and Methods:** The Prices of different Hypolipidemic drugs manufactured by different Pharmaceutical companies were taken form IRD tripeli (Indian Drug Review) drug compendium 2017. The difference in the minimum and maximum price of the same drug manufactured by different pharmaceutical companies and percentage variation in cost per 10 tablets was calculated. **Results:** A total of 21 drugs (11 single 10 combination preparation) which were manufactured by different companies were analyzed .In single drug therapy atorvastatin 20 mg has maximum percentage (1017.78%) variation while pravastatin 10 mg has minimum percentage variation (1.01%). Among lipoprotein lipase activators Finofibrate 200mg showed maximum variation (549.43%) and Bezafibrate 200 mg has least percentage variation (10%). **Conclusion:** In the Indian market, there is a wide cost variation among different brands of oral hypolipidemic drugs of same strength and dosage forms. Therefore, physicians should be encouraged to prescribe the drugs by generic names as they are cheaper and in no way inferior to costlier branded counterpart. This would alsoreduce the economic burden on the patients.

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INTRODUCTION

Dyslipidemia is the major risk factors for atherosclerosis and atherosclerosis-induced conditions such as coronary heart disease (CHD), ischemic cerebrovascular disease (CVA) and peripheral vascular disease. Cardiovascular diseases (CVD) are one of the leading causes of death worldwide. Studies from India reported approximately 46.9 million patients with cardiovascular diseases which lead to death of an estimated 1.2 million people. India is expected to contribute for more than half the cases of CVD globally within the next 15 years(Bersot, 2010; Park, 2009). Raised plasma cholesterol is an important risk factor for coronary artery disease. Raised plasma triglyceride levels or low plasma high density lipoproteins - cholesterol (HDL-CH) levels are independent high risk factors for CAD and stroke (Tripathi, 2013). Statins have been found to reduce the risk of subsequent CHD events and non-hemorrhagic stroke in virtually every type of dyslipidemia. Therefore, statins are the first line drugs among different classes of lipid-lowering agents(Bersot, 2010). Pharmaco-economics plays an important role in practice of medicine in developing countries.

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Cost of drugs is an important factor influencing compliance to treatment of disease and also constitutes an essential part of rational drug prescription. Indian pharmaceutical industry have a number of branded formulations for oral hypolipidemic drugs with wide cost variation between the different brands of the same formulation. This difference in cost has resulted in unnecessary economic burden on the patients (Das*et al*., 2007; Gupta, 2013). Drug price control order (DPCO) has been brought into the action to regulate the drug prices to improve the affordability. Dyslipidemia requires long course of treatment. Adherence to the treatment regimen is essential for the successful treatment of dyslipidemia (Shrank*et al*., 2006). Higher drug cost can lead to non-compliance which in turn leads to treatment failure. Therefore, there is a need to create awareness about pharmacoeconomics of drug therapy among physicians to improve the patient adherence and decrease the rate of treatment failure. Hence, this study was taken up to analyze the cost variation of various brands of the same generic oral hypolipidemic drugs available in Indian market.

MATERIAL AND METHODS

This was an analytical study started after the approval of institutional ethic committee, JNMC, DMIMS (DU) sawangi (Meghe) Wardha . ''IRD tripeli (Indian Drug Review) drug

compendium 2017'' edition was referred to analyze the maximum and minimum price in INR (per 10 tablets) of various oral hypolipidemic drugs of same strength and dosage forms being manufactured by different companies in India (IRD, 2017). Difference between the maximum and minimum cost of the same drug formulation manufactured by different pharmaceutical companies was calculated and compared. The cost ratio i.e. the percentage ratio between the maximum and minimum cost of the same generic oral hypolipidemic drug was calculated as follows:

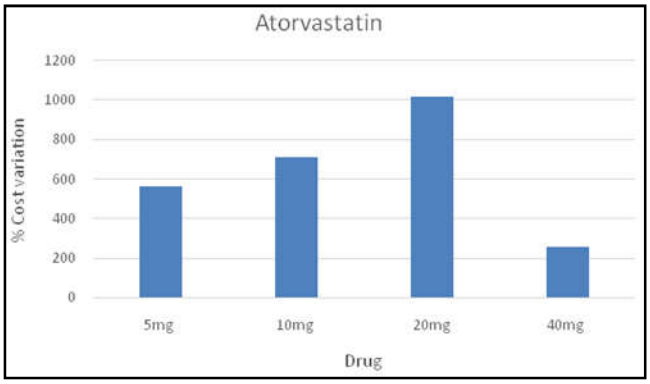
Cost ratio = Max cost ÷ Min cost

And the percentage variation was calculated as follows:

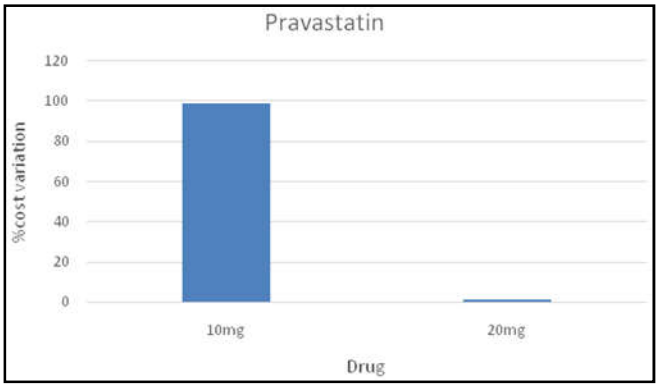
$$\% \text{ costvariation} = \frac{(\text{Maximum cost-Minimumcost}) \times 100}{\text{Minimum cost}}$$

RESULTS

A total of 21 drugs (11 single 10 combination preparation) which were manufactured by different companies were analyzed.Ingraph.1, Single drug therapy atorvastatin 20 mg shows maximum percentage (1017.78%) variation, whilegraph.2, Pravastatin 10 mg has minimum percentage variation (1.01%). Among lipoprotein lipase activatorsgraph. 3, Finofibrate 200mg showed maximum variation (549.43%) andgraph. 4, Bezafibrate 200 mg has least percentage variation (10%). This study showed a wide variation in the cost of different brands of same hypolipidemic drug available in Indian market. In combination therapy total 10 combinations were analyzed graph.1 shows the percentage cost variation of oral hypolipidemic drugs used as monotherapy and combination therapy.



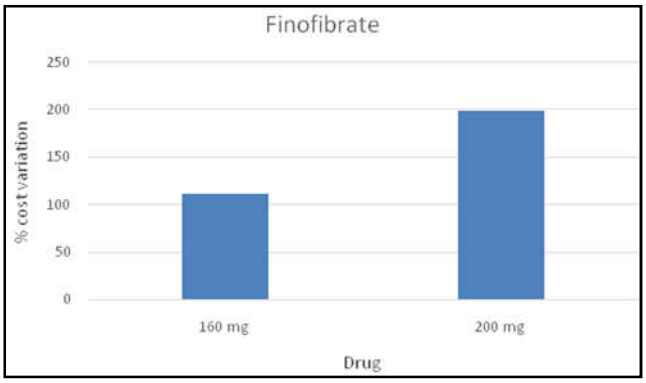
Graph 1. Percentage cost variation of Atorvastatin



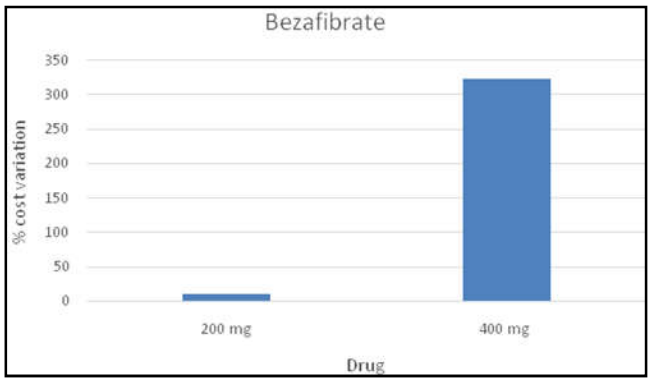
Graph 2. Percentage cost variation of Parvastatin

Table 1.

Hypolipedimic Drugs	% Cost Variation
Atorvastatin	
5mg	565.35
10mg	710.15
20mg	1017.78
40mg	253.45
Atorvastatin+ ezetimibe	
10mg +10mg	137.35
20mg +10mg	197.7
Lovastatin	
10mg	200
20mg	157.73
Parvastatin	
10mg	99.1
20mg	1
Rosuvastatin	
5mg	340
10mg	528.57
20mg	370.58
Simvastatin	
5mg	154.28
10mg	169.45
20mg	518.56
Simvastatin + Ezetimibe	
10mg+ 10mg	79.32
Bezafibrate	
100mg	10
200mg	323.1
Ezetimibe	
10mg	119.4
Fenofibrate	
67 mg	111.07
160 mg	198.87
Gemfibrozil	
300 mg	129.8
600mg	137.24
Nicotinic acid	
375 mg	29.62
Atorvastatin + finofibrates	
10 mg + 160 mg	188.61
10mg + 200 mg	149.272



Graph 3. Percentage cost variation of Finofibrate



Graph 4. Percentage cost variation of Bezafibrate

DISCUSSION

In India, more than one pharmaceutical company sells a particular drug under different brand names along with the innovator company. This situation has led to greater price variation among drugs marketed (Thomas, 2004). These wide variations in the prices of different formulations of the same drug have severe economic implications on the Indian population. This study findings reveal a high variation in the maximum and minimum prices of oral hypolipidemic drugs used as both monotherapy and fixed dose combinations (Table 1). The percentage variation in the cost was above 100% with most of the hypolipidemic drugs and there is wide variation in the cost of different brands of same hypolopidemic drug in Indian market which is in accordance with the results obtained from previous studies (Chawan *et al*., 2014; Shukla and Sharma, 2016). Also, similar findings were seen with studies on antihypertensives, antibiotics and anti-diabetic drugs etc (Kamath and Satish, 2016; Zubin *et al*., 2015; Lalan *et al*., 2014). Higher medication costs have been found to be a reason for medication non-compliance (Ho *et al*., 2009). Noncompliance to treatment regimen results in progression of the disease which increases the overall medical care costs. Unlike developed countries, in a country like India, where majority of patients pay themselves for their medical bills and are not covered by insurance schemes.Provision of drug manual with comparative prices and sensitization about the pharmacoeconomic aspects of drug therapy among physicians by conducting regular training programs can improve such situations. Drug Price Control Order (DPCO) is an order issued by the Indian government to fix prices of drugs. Once any medicine is brought under DPCO, it cannot be dispensed at a price higher than that fixed by the government. (http://www.nppaindia.nic.in/DPCO2013.pdf) Currently, very few oral hypolipidemic drugs are under drug price control order (DPCO). This is an important factor responsible for wide cost variation among their different brands. Hence, it is high time that the government should bring more hypolipidemic drugs under price control. Thus, this study highlights that there is a wide variation in cost among the oral hypolipidemic drugs manufactured by different pharmaceutical companies. Therefore effective measures must be taken by the government in bringing uniformity in drug pricing.

Conclusion

These observations reveal a significant percentage of cost variation. Hence it is recommended that appraisal and pricing of drug should be regulated to reduce the economic burden on the patient. And there is a strong need to create awareness about this huge price variation among the general public, health care providers, government agencies, policy makers for appropriate intervention to reduce economic burden on the patients as well as the healthcare system.

Limitations: The limitation of the study is that sources of information were limited to 'IRD tripel i' (Indian Drug Review) drug compendium, but there are few other brands which are marketed in India but not published in the above mentioned source.

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