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Cost variation analysis of various brands of oral hypolipidemic drugs available in Indian pharmaceutical market

Mamatha K.R¹, Vishnu K^{2*}

¹Professor, ²Postgraduate, Department of Pharmacology, Bangalore Medical College and Research Institute, Bengaluru, Karnataka, India

*Corresponding author: Dr. Vishnu K

Email: emailtovishnu@gmail.com

ABSTRACT

Introduction

Dyslipidemia is the most common risk factor for cardiovascular morbidity and mortality worldwide requiring lifelong therapy. Hence cost of drugs plays an important role in patient's care necessitating the need for all physicians to keep themselves updated regarding latest prices and price variation of various brands of hypolipidemic drugs.

Materials and Methods

Cost of oral hypolipidemic drugs manufactured by different pharmaceutical companies in the same strength and dosage forms was obtained from "Current Index of Medical Specialties" (CIMS) April- July 2017. The difference in the maximum and minimum price of the same drug manufactured by different pharmaceutical companies and percentage variation in cost per 10 tablets was calculated.

Results

In this study, there exists a wide cost variation among the different brands of same hypolipidemic drug. Percentage cost variation for individual hypolipidemic drugs was found to be highest with atorvastatin (20 mg FC-tablet): 1017.79% followed by rosuvastatin (20mg tablet): 308.16%, gemfibrozil (300mg capsule): 109.14%, lovastatin (20mg tablet): 87.83%, fenofibrate (200mg capsule): 79.53%, simvastatin (5mg tablet): 77.43%, ezetimibe (10mg tablet): 72.84%. Among the fixed dose combination therapy, percentage cost variation was found to be highest with atorvastatin + fenofibrate (10mg + 160mg FC-tablet): 266.67% followed by atorvastatin +ezetimibe (10mg + 10mg tablet): 139.39%, rosuvastatin + fenofibrate (10mg + 160mg tablet): 81.05%

Conclusion

In Indian market, there exists a wide cost variation amongst various 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 in turn reduces the economic burden on the patients.

Keywords: Cost analysis, Cost variation, Hypolipidemic drugs

INTRODUCTION

Dyslipidemia is one of 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 CVD 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. [1, 2] Raised plasma cholesterol is an important risk factor for coronary artery disease (CAD). Raised plasma triglyceride (TG) levels or low plasma high density lipoproteins - cholesterol (HDL-CH) levels are independent high risk factors for CAD and stroke.[3] 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. [1]

Pharmaco-economics plays an important role in practice of medicine in developing countries. Cost of drugs is an important factor influencing adherence 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. [4]

High medical care costs are an important issue for policy makers and service providers. [5] 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. [6] Higher drug cost can lead to non adherence 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 pharmaceutical market.

MATERIALS AND METHODS

This was an analytical study. "Current Index of Medical Specialities (CIMS) April-July 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.[7]

Oral hypolipidemic drug formulations of same strength and dosage forms were included and the drug formulation being manufactured by only one company were excluded from the study.

Difference in the maximum and minimum cost of the same drug formulation manufactured by different pharmaceutical companies was calculated.

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

$$\text{Cost ratio} = \frac{\text{Maximum cost}}{\text{Minimum cost}}$$

Percentage cost variation was calculated as follows:

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

RESULTS

The prices of oral hypolipidemic drugs manufactured by different pharmaceutical companies were analyzed.

Table 1: Variation in the cost of oral hypolipidemic drugs

Drug	Dose (mg)	Dosage form	Minimum cost (INR)	Maximum cost (INR)	Cost ratio	% Cost variation	Brands	Formulations
Atorvastatin	5	*FC-Tab	9	63.5	7.06	605.56	13	
		Tablet	16	90	5.63	462.50	7	
	10	*FC-Tab	12	96.62	8.05	705.17	19	
		Tablet	24.5	89	3.63	263.27	46	5
	20	*FC-Tab	19	212.38	11.18	1017.79	19	
		Tablet	45	170	3.78	277.78	35	
	40	*FC-Tab	79	258.47	3.27	227.18	14	
		Tablet	89	220	2.47	147.19	10	
80	*FC-Tab	160	446.2	2.79	178.88	7		
	Tablet	175	280	1.60	60.00	3		
Ezetimibe	10	Tablet	56.7	98	1.73	72.84	4	1
Fenofibrate	145	*FC-Tab	91.8	119	1.30	29.63	2	2
	200	Capsule	76.99	138.22	1.80	79.53	3	
Gemfibrozil	300	Capsule	35	73.2	2.09	109.14	2	1
Lovastatin	10	Tablet	45.1	75	1.66	66.30	3	2
	20	Tablet	66.55	125	1.88	87.83	3	
Rosuvastatin	5	*FC-Tab	25	67	2.68	168.00	6	
		Tablet	34	65	1.91	91.18	20	
	10	*FC-Tab	49	132	2.69	169.39	6	4
		Tablet	55	122.75	2.23	123.18	26	
	20	*FC-Tab	85	237.1	2.79	178.94	6	
		Tablet	98	400	4.08	308.16	17	
	40	*FC-Tab	300	417	1.39	39.00	2	
		Tablet	266	285	1.07	7.14	3	
Simvastatin	5	Tablet	35	62.1	1.77	77.43	3	
	10	Tablet	58	97.42	1.68	67.97	3	3
	20	Tablet	147.5	163.9	1.11	11.12	2	

*FC-Tab: Film-coated tablet

Table 1 shows percentage cost variation of oral hypolipidemic drugs used as monotherapy.

This study showed a wide variation in the cost of different brands of same hypolipidemic drug available in Indian market. Percentage cost variation of oral hypolipidemic drugs used as monotherapy was found to be atorvastatin (20 mg FC-tablet): 1017.79%, rosuvastatin (20mg tablet): 308.16%,

gemfibrozil (300mg capsule): 109.14%, lovastatin (20mg tablet): 87.83%, fenofibrate (200mg capsule): 79.53%, simvastatin (5mg tablet): 77.43%, ezetimibe (10mg tablet): 72.84%. The highest percentage cost variation was found for atorvastatin (20 mg FC-tablet): 1017.79% where as lowest percentage cost variation was found for rosuvastatin (40mg tablet): 7.14% (Figure 2).

Table 2: Variation in the cost of fixed dose combinations of oral hypolipidemic drugs

Drug combination	Dose (mg)	Dosage form	Minimum cost (INR)	Maximum cost (INR)	Cost ratio	% Cost variation	Brands	Formulations
Atorvastatin + Ezetimibe	10+10	*FC-Tab	71	138.5	1.95	95.07	6	2
		Tablet	49.4	118.26	2.39	139.39	16	
	20+10	*FC-Tab	85.25	153.1	1.80	79.59	2	
		Tablet	95	198.55	2.09	109.00	3	
Atorvastatin + Fenofibrate	10+160	*FC-Tab	39	143	3.67	266.67	5	2
		Tablet	58	138.45	2.39	138.71	15	
	10+200	*FC-Tab	82	109.7	1.34	33.78	2	
		Tablet	138.32	189.6	1.37	37.07	2	
Atorvastatin 10mg + Micronized fenofibrate 160mg	10+160	Tablet	138.32	189.6	1.37	37.07	2	1
Rosuvastatin + Fenofibrate	5+67	Tablet	88.95	95	1.07	6.80	2	5
	5+145	Tablet	85.2	104	1.22	22.07	3	
	10+67	Tablet	110	176	1.60	60.00	3	
	10+145	Tablet	105.71	148	1.40	40.01	6	
	10+160	Tablet	95	172	1.81	81.05	5	

***FC-Tab:** Film-coated tablet

Table 2 shows percentage cost variation of oral hypolipidemic drugs used as fixed dose combinations.

Percentage cost variation of oral hypolipidemic drugs used as fixed dose combinations was found to be atorvastatin + fenofibrate (10mg + 160mg FC-tablet): 266.67%, atorvastatin +ezetimibe (10mg +

10mg tablet): 139.39%, rosuvastatin + fenofibrate (10mg + 160mg tablet): 81.05%. The highest percentage cost variation was found for atorvastatin + fenofibrate (10mg + 160mg FC-tablet): 266.67% where as lowest percentage cost variation was found for rosuvastatin + fenofibrate (5mg + 67mg tablet): 6.80% (Figure 4).

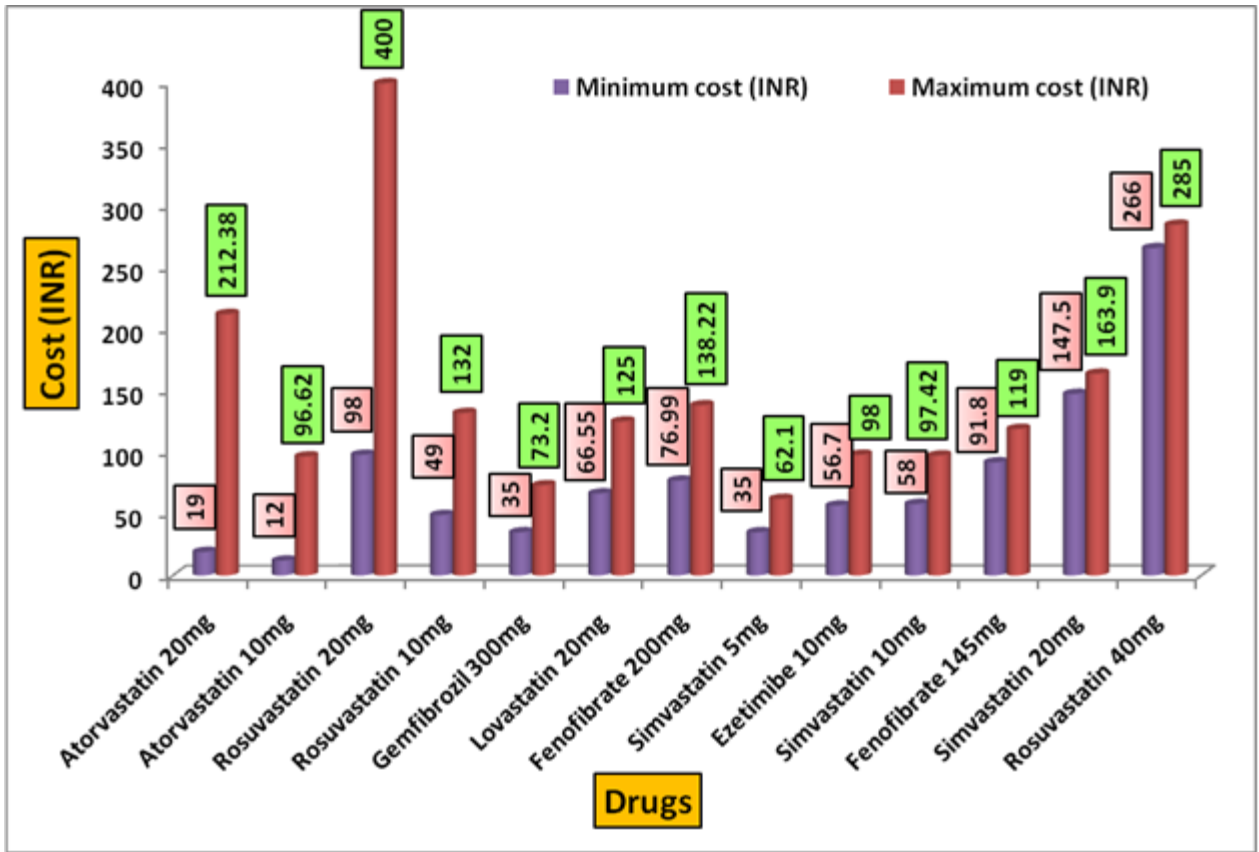


Figure 1: Cost difference [Minimum and Maximum] of oral hypolipidemic drugs used as monotherapy

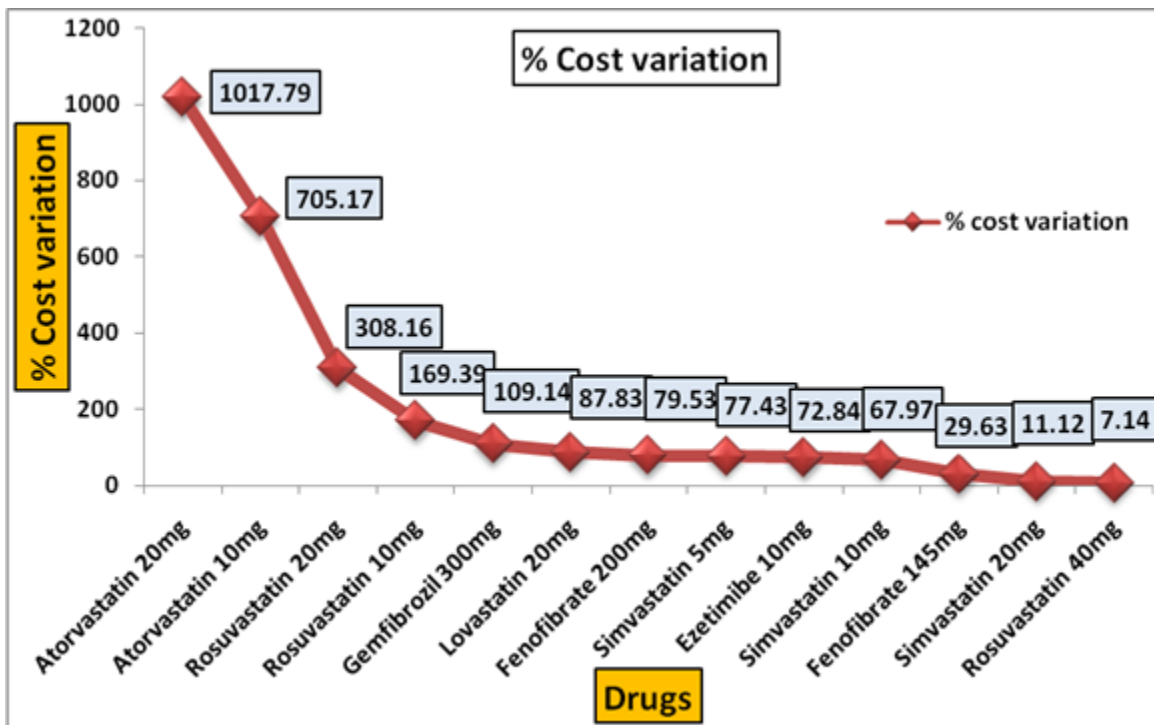


Figure 2: Percentage cost variation of oral hypolipidemic drugs used as monotherapy

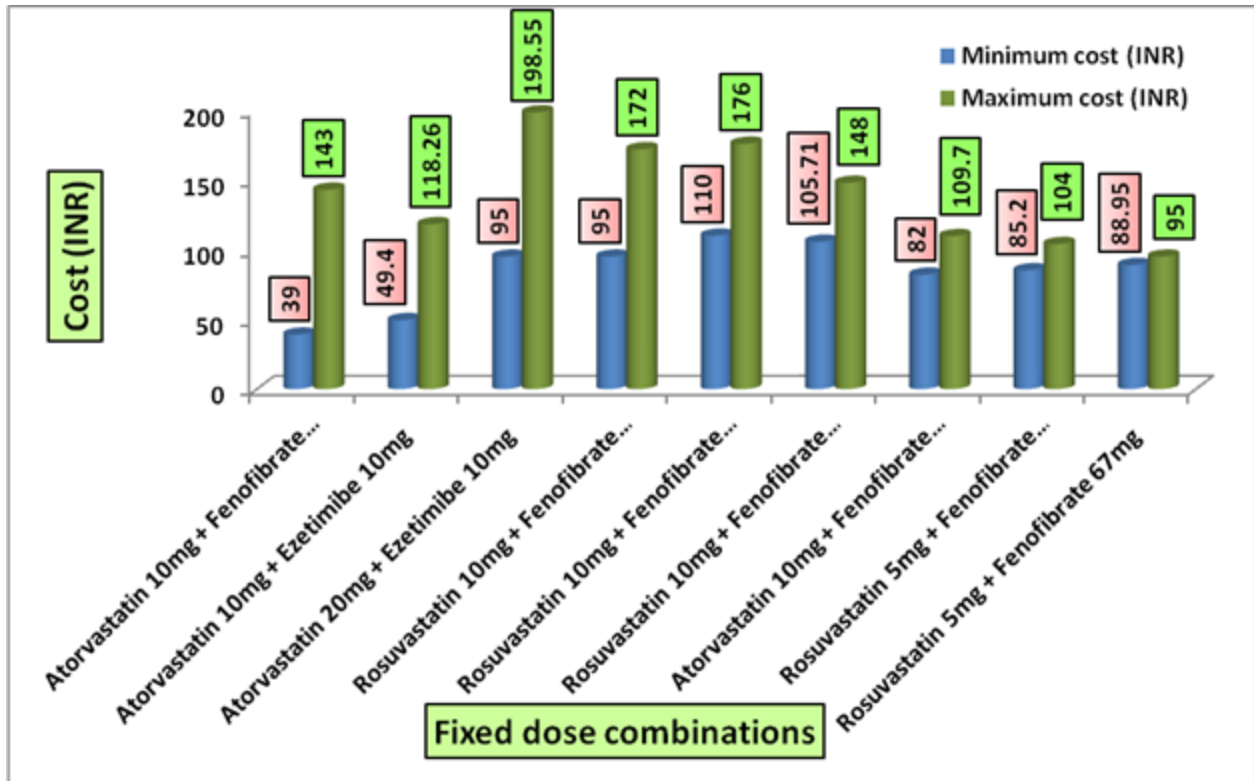


Figure 3: Cost difference [Minimum and Maximum] of fixed dose combinations of oral hypolipidemic drugs

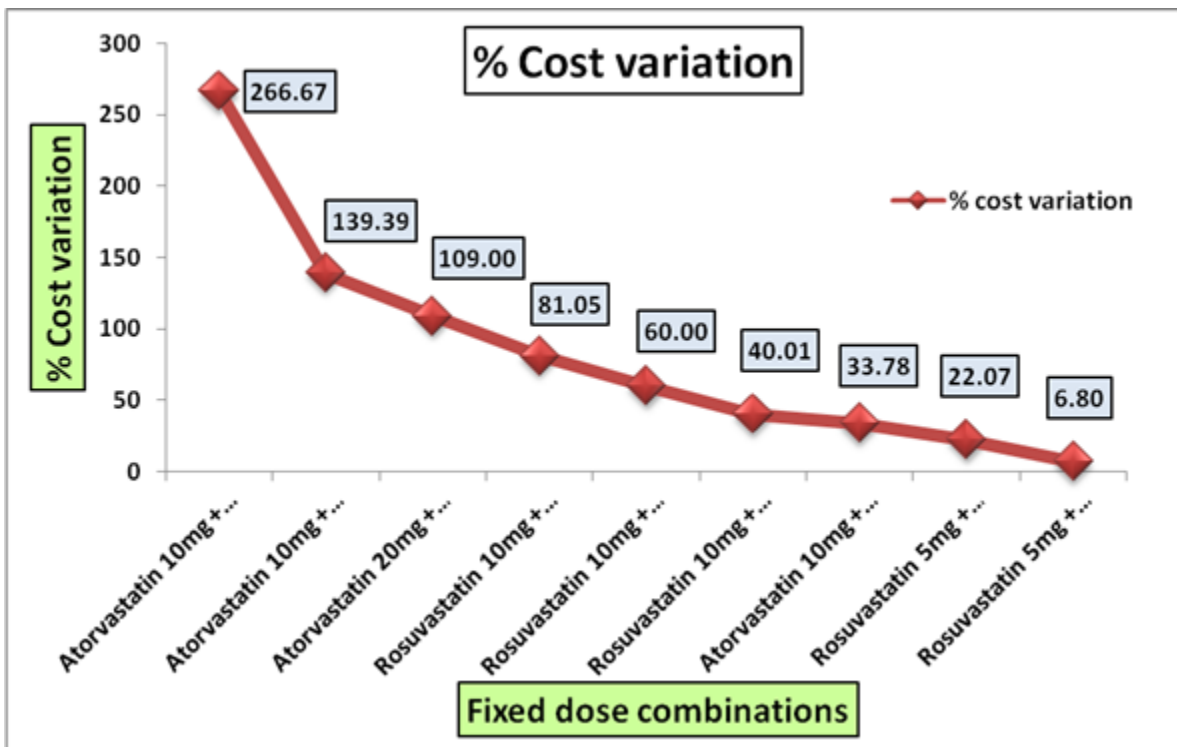


Figure 4: Percentage cost variation of fixed dose combinations of oral hypolipidemic drugs

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. [8] 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 (Figure 1 and 3). 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 hypolipidemic drug in Indian market which is in accordance with the results obtained from previous studies. [9, 10] Also, similar findings were seen with studies on anti-hypertensives, antibiotics and anti-diabetic drugs etc. [11, 12, 13]

Higher medication costs have been found to be a reason for medication non-adherence. [14] Non-adherence to treatment regimen results in progression of the disease which increases the overall medical care costs dramatically. Unlike developed countries, in a country like India, where majority of patients pay money out of their pockets for their medical bills and are not covered by insurance schemes.[15] In such situation if costly brands are prescribed, patients has to pay more money unnecessarily and that imposes an economic burden to the patient. Provision of drug manual with comparative prices and sensitization about the pharmaco-economic 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.[16] 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

The present study findings showed a wide variation in the prices of different brands of same hypolipidemic drugs currently available in Indian market. Therefore 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 CIMS but there are few other brands which are marketed in India but not published in the above mentioned source.

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