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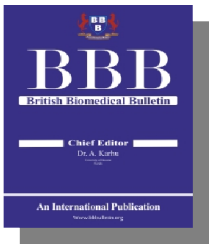
BRITISH BIOMEDICAL BULLETIN



Original

Cost Analysis Study of HMG CoA Inhibitors

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ARTICLE INFO

Received 12 Dec. 2014
Received in revised form 02 Jan. 2015
Accepted 07 Jan. 2015

Keywords:
Cost analysis study,
HMG CoA inhibitors.

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ABSTRACT

Context: 3-hydroxy-3-methyl glutaryl coenzyme A (HMG-CoA) reductase inhibitors, also called as statins are widely used to treat dyslipidaemia which is a significant risk factor for cardiovascular diseases. The importance of pharmaco economic studies are increasing due to explosion of new drugs in the market, the wide variations in the patterns of drug prescribing, the growing concern about cost of drugs.

Objective: To evaluate the cost and difference in cost of different brands for statins by calculating cost range, cost ratio and average cost.

Methods: The cost in Indian National Rupees among the different brands of same generic name is evaluated by using Monthly Index of Medical Specialities (MIMS) October 2013 edition and electronic database search through "Medlineindia". The study is done by calculating cost of drug per 10 dosage forms. The cost range is expressed as minimum cost per ten dosages to maximum cost per ten dosages. The cost ratio is calculated as maximum cost divided by minimum cost. The average cost of generic drug is calculated as total drug cost of different brand names divided by total number of brands available for the same generic drug.

Results: The group of HMG CO-A reductase inhibitors include atorvastatin, lovastatin, simvastatin, rosuvastatin, fluvastatin, pravastatin and pitavastatin. There are multiple brands of same generic drug available in the market with wide cost range. For example, the cost range (in INR) of atorvastatin 5mg is 9.00-68.80, 10mg is 12.00-118.50, 20mg is 19.00-212.38, 40 mg is 85.00-280, 80mg is 160.00-374.50.

Conclusion: Ideally the drugs should be prescribed by generic names and no brand is proved to be scientifically superior to other brand. The cheaper brand drug improves patient compliance by saving patient money.

Introduction

Hyperlipidaemia is the most common etiological agent for cardiovascular morbidity world-wide. The prime goal of statins is to protect from the complications of hyperlipidaemia. They inhibit the rate-limiting step of cholesterol biosynthesis, the conversion of HMG-CoA to L-mevalonic acid, through binding to the active site of HMG-CoA reductase and blocking the substrate product transition state of the enzyme.[1] Hyperlipidaemia requires lifelong therapy resulting in huge financial burden to the patients. Even a minor change in the cost of statins may cause substantial relief to the patient by saving patient money and increasing patient compliance.

In India estimates from National Sample Survey 1999-2000 suggests that over 5% of the total expenditure of household went to health.[2] The recent trend supports cost effective practice by physician. The importance of pharmaco-economic study is increasing in the present scenario due to prescription of drugs by brand names and wide cost range. Pharmaco-economics is defined as the study of the description and analysis of the costs of drug therapy to health care system and society.[3]

The present study aims at survey of drug cost by calculating cost range and cost ratio. The present study helps to find out cost-effective treatment with respect to statins, thus results in compliance to treatment and may have impact on national expenditure.

Material and methods

Drugs included in the study are atorvastatin, lovastatin, simvastatin, rosuvastatin, fluvastatin, pravastatin and pitavastatin, as these are available in Indian market.

The cost in Indian National Rupees among the different brands of same drug like atorvastatin 10mg, 20 mg, 40 mg is evaluated by using Monthly Index of Medical Specialities (MIMS) October 2013[4] edition and electronic database search through "Medlineindia".

The study is done by calculating cost of drug per 10 dosage forms. The cost range is expressed as minimum cost per ten dosages to maximum cost per ten dosages. The cost ratio is calculated as maximum cost divided by minimum cost. The average cost of generic drug is calculated as total drug cost of different brand names divided by total number of brands available for the same generic drug.

Results

The statins commonly in use include atorvastatin, lovastatin, simvastatin, rosuvastatin, fluvastatin, pravastatin and pitavastatin. Number of brands for atorvastatin are 173; lovastatin, simvastatin are 21 each; rosuvastatin are 41; fluvastatin and pravastatin 1 each and pitavastatin are 2. There is wide cost range as there are multiple brands for same generic drug.

The cost range(in INR) of atorvastatin 5mg is 9.00-68.80, 10mg is 12.00-118.50, 20mg is 19.00-212.38, 40 mg is 85.00-280.00, 80mg is 160.00-374.50. The cost range of rosuvastatin 5mg is 23.00-160.00, 10mg is 45.00-259.00, 20mg is100.00-320.00, 40mg is 280.00-527.50. The cost range of simvastatin 5mg is 25.00-89.00, 10mg is 29.50-149.60, 20mg is 55.00-185.00, 40mg is 75.00-336.00. The cost range (in INR) of lovastatin 10mg is 27.65-120.00, 20 mg is 45.25-210.00. The cost range of pitavastatin1mg is 44.22-90.00, 2 mg is 70.00-150.00. (See figure 1&2 and table 1.)

Discussion

United Nations Development Programme reveals an estimated 29.8%

Indians live below the poverty line. [5]The cost of drugs become a significant financial problem for people below poverty line. Cost of drugs form the socio-economic basis for health care decision making.

Coronary heart disease (CHD) is epidemic in India and one of the major causes of disease-burden and deaths. The INTERHEART-South Asia study identified that hyperlipidaemia is established coronary risk factor in Indians. Statins reduce the incidence of major coronary events, coronary procedures and stroke.[6]

The cost of drugs play important role in patient's care in developing countries[7] and many of the times it has been observed that doctors have sub optimal awareness of drug cost.[8] Amention of drug cost in medical literature and drug advertisements may improve the current scenario. The medical training programme of the doctors must lay greater emphasis on drug cost.[9] The application of economic analysis will help in therapeutic decision making, formulary decision making, program justification, drug policy decisions and treatment guidelines.[10] Health economics is about making choices by weighing the costs and benefits among the options.[11] Ideally, the drugs should be prescribed by generic names and no brand is proved to be scientifically superior to other brand.

Conclusion

The present study concludes that different brand names of a generic drug show wide cost range. Prescription of cheaper brand helps in proper planning of economy by health planners. Allocation of funds and resources should be more rational and efficient. Therapeutic goals of physicians can be achieved by patient compliance which ultimately depend on the cost of drugs prescribed.

Acknowledgement

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Table 1. Cost analysis of statins

S. No.	Drug	Dose (in mg)	Minimum Cost (in INR)	Maximum Cost (in INR)	Cost difference (in INR)	Cost ratio	Average cost (in INR)	Total no. of brands
1.	Atorvastatin	5	9	68.88	59.88	7.65	37.68	33
		10	12	118.5	106.50	9.87	58.31	146
		20	19	212.38	193.38	11.17	106.72	106
		40	85	280	195	3.29	178.10	33
		80	160	374.50	214.50	2.34	267.90	12
2.	Rosuvastatin	2.5	----------	----------	----------	--------	38.50	1
		5	23	160	137	6.95	56.89	28
		10	45	259	214	5.75	104.58	33
		20	100	320	220	3.2	191.01	20
		40	280	527.50	247.50	1.88	372.75	6
3.	Simvastatin	5	25	89	64	3.56	43.84	16
		10	29.5	149.60	120.1	5.07	69.60	18
		20	55	185	135	3.36	116.72	14
		40	75	336	261	4.48	207	3
4.	Lovastatin	10	27.65	120	92.35	4.33	51.67	16
		20	45.25	210	164.75	4.64	90.56	21
5.	Pitavastatin	1	44.22	90	45.78	2.03	67.11	2
		2	70	150	80	2.14	110	2
6.	Pravastatin	10	-------	----------	----------	--------	100	1
		20	-------	----------	----------	--------	165	1
7.	Fluvastatin	80	--------	----------	----------	--------	338.21	1

Note: The blanks in the above table suggest that there is a single brand available for the drug and hence there is no minimum cost, maximum cost, cost difference and cost ratio.

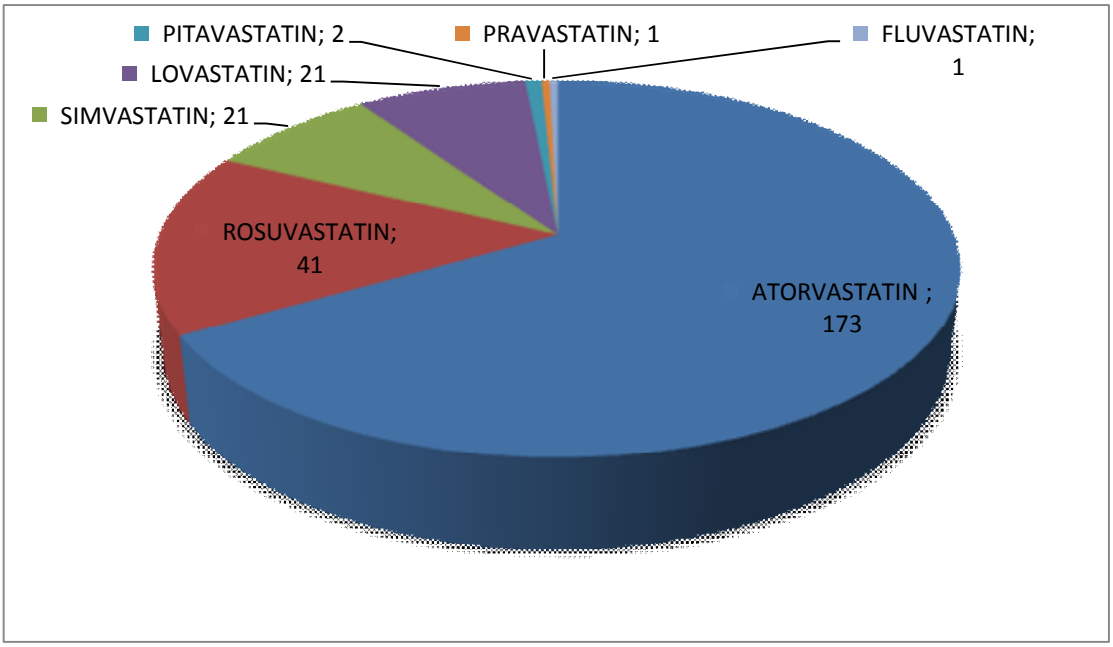

Figure 1. Number of brands for different statins

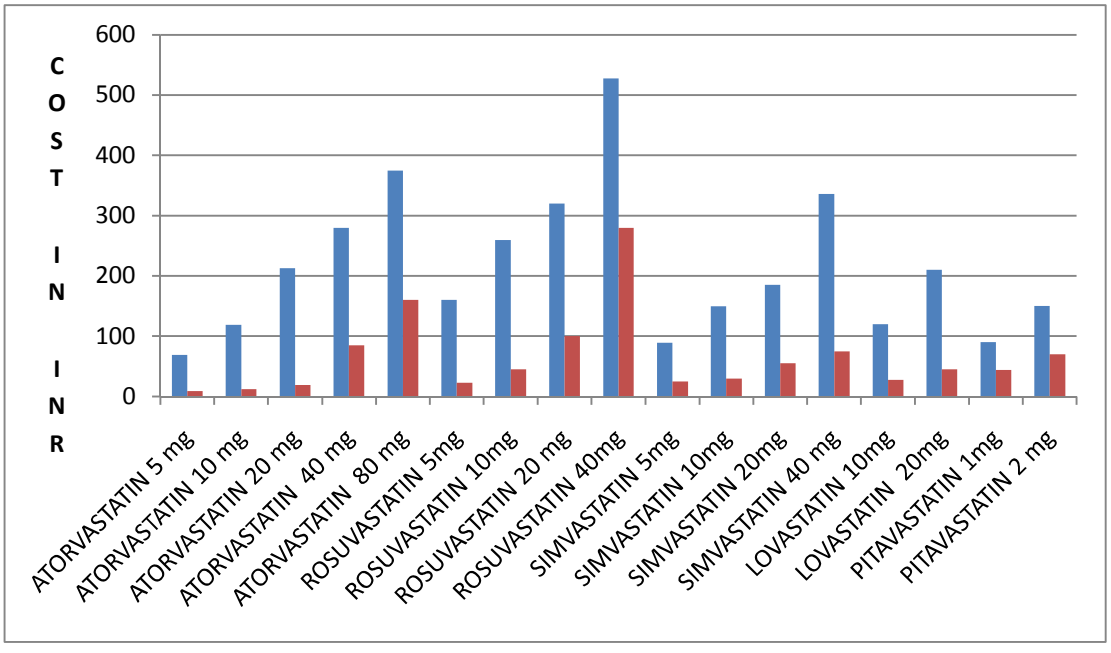

Figure 2. Cost range for different doses of statins