

Comparative Analysis of the Cost of Drugs Used to Treat Acid Peptic Diseases, Marketed in India: An Observational Study.

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Abstract:

Introduction: In developing nations like India, drug prices play a pivotal role in healthcare. In India, the out-of-pocket (OOP) expenditure as a percentage of the total health expenditure has remained consistently high: 69.4% in 2004, 64.2% in 2014, and 62.6% in 2015. Besides safety and efficacy, drug prices are considered while including drugs in formularies and the National List of Essential Medicines (NLEM).

Aims & Objectives: The aim of this study was to evaluate the variation in the prices of different brands of the same drug used to treat acid peptic disease by obtaining the percentage cost variation.

Material & Methods: This study followed an analytical method. The October - December 2020 edition of the Indian Drug Review (IDR) and the January 2024 edition of Monthly Index of Medical Specialities (MIMS) India were referred for maximum and minimum prices of the drugs under consideration in Indian rupees (INR) as available in the Indian market. Drugs and formulations whose prices were not mentioned in the above sources were excluded from the study. Cost ratio and percentage variation in cost per tablet/capsule/injection of different drugs available in the Indian market and manufactured by different pharmaceutical companies were calculated.

Results: A total of 560 brands of drug dosage formulations used to treat acid peptic disease were available in Indian market. Percentage variation in cost among the commonly prescribed drugs for the management of acid peptic disease was found to be highest for Rabeprazole 20 mg tablet (3,311.20%) and Lowest for Lansoprazole 30mg tablet (117.18%) However in Combination drug dosage (FDC) formulations it was highest for Aluminium hydroxide + Magnesium hydroxide + Methylpolysiloxane FDC 250/250/40mg (1483.67%). while it was lowest for Pantoprazole+Levosulpiride FDC 20mg/75mg (0.56%).

Conclusions: Wide differences exist in the costs of various drug formulations used to treat acid peptic disease that are available in the Indian market. The prescribing physician should be aware of these variations and prescribe medicines accordingly, keeping in mind the financial status of the patients.

Keywords: Acid Peptic Disease Drugs; Cost Analysis; Cost Variation.

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Introduction

The right to health is a fundamental human right, which includes access to medicine [1]. A crucial factor that determines the accessibility and affordability of a medication is its price. According to the World Health Organization (WHO), policy makers should apply schemes to manage medicine prices, ensuring that citizens can easily access necessary medications [2]. Medications are considered a public health product and therefore, in several countries, are funded completely or partially by the government [3]. The prices of drugs are set by the pharmaceutical companies, which are regulated by the government authorities and national industry policies [4]. Owing to differences

in governmental policies and pharmaceutical industry approaches, the prices of medications differ from country to country [5]. Prices can also vary between countries owing to differences in the manufacturer prices or the pharmacy retail prices [4]. Some medications might be relatively inexpensive but, with taxation, the consequent price for the end user becomes inordinately expensive.

In India, studies are lacking which compare the cost of same drug sold under different brand names by different pharmaceutical companies. Therefore, this study was undertaken to compare the cost of different brands of the drug used to treat acid peptic disease. Moreover, APD drugs are given for

prolonged period, which have an influence on mortality and morbidity in patients with complications due to inappropriately treated APDs.

Materials & Methodology

This was an analytical study, cost of drugs used to treat acid peptic diseases was calculated for all the available drug dosage forms. APD drug formulations with various strength, dose, and dosage formulations were included for the study. The drug manufactured by single company was excluded from the study. "Indian Drug Review (IDR)" October - December 2020 edition and the January 2024 edition of Monthly Index of Medical Specialties (MIMS) India were referred to know the maximum and minimum price in INR (per 10 tablets) of APD drugs in all the available strength and dosage forms being manufactured by different companies in India were obtained [6]. Percentage cost variation of the costliest to the cheapest brands

of the same generic APD drug was calculated. From this, we can know how many times the costliest brand costs more than the cheapest brands in each generic group.

Cost ratio = Maximum cost/Minimum cost

Percentage cost variation [7] was calculated by

Cost variation % = [(Maximum cost - Minimum cost) × 100]/Minimum cost

Statistical Analysis: Data were analyzed using percentages and proportions.

Results

The prices of APD drugs produced by several pharmaceutical companies were analyzed. A total of 560 brands of drug dosage formulations used to treat acid peptic disease were available in Indian market (Figure-1).

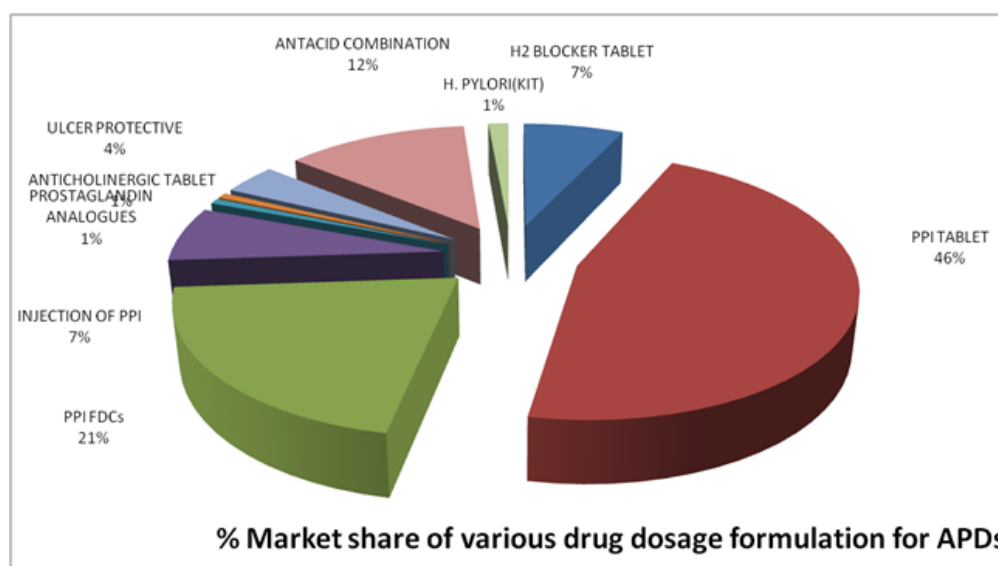


Figure 1: Market share (in %) of various drug dosage formulation for APDs

Wide variation in the prices of several brands of same APD drug dosage formulations was found in Indian pharmaceutical market (Table-1).

Table 1: Details of various APD drug dosage formulation available in Indian Market

S. No.	Drug Name	Strength	No of Brands available	Maximum Cost per cap/tab	Minimum cost per cap/tab	Cost Ratio	Percentage Cost Variation
A Combination Of Rabeprazole							
1	Domperidone, Domperidone, Rabeprazole	20/10/20mg	2	5.9	4.807	1.23	22.90%
2	Rabeprazole, Domperidone	20/30mg	36	12.6	5.55	2.27	129%
3	Rabeprazole, Aceclofenac	20/200mg	2	12.3	4.9	2.51	151%
4	Rabeprazole, Levosulpiride	20/75mg	17	24.85	7.699	3.23	222.77%
B Combination of Lansoprazole							
1	Lansoprazole, Domperidone	30/10mg	2	8.86	5	1.772	77.20%
C Combination of Esomeprazole							
1	Esomeprazole, Levosulpiride	40/75mg	5	17.9	13.4	1.34	33.58%

2	Esomeprazole Mg Trihydrate, Domperidone	40/30mg	5	14.9	7.5	2	99.87%
3	Esomeprazole, Domperidone	40/30mg	22	17.9	4.95	3.61	261.60%
D Combination Of Dexrabeprazole							
1	Dexrabeprazole Sodium, Domperidone	10/30mg	14	12.8	3.99	3.2	220.80%
E Combination of Omeprazole							
1	Omeprazole, Ondansetron	10/4mg	3	4.4	3.2	1.375	37.50%
F Combination of Pantoprazole							
1	Pantoprazole, Levosulpiride	20/75mg	7	18	17.9	1.0056	0.56%
		40/75mg	2	14.3	12.5	1.144	14.40%
G Injection of PPI							
1	Rabeprazole	40mg	23	120	56	2.14	114.30%
2	Esomeprazole	40mg	15	117.5	52.6	2.23	123.40%
H PPI Tablet							
1	Rabeprazole	20mg	50	18.25	0.535	34.11	3311.20%
		10mg	10	5.85	1	5.85	485%
		40mg	4	20.67	4.1	5.04	404.14%
2	Lansoprazole	30mg	14	9	4.144	2.17	117.18%
		15mg	9	8.5	2.066	4.11	311.40%
3	Esomeprazole	40mg	13	15.276	2.7	5.66	465.77%
		20mg	10	11.428	2.5	4.57	357.12%
4	Dexrabeprazole	10mg	12	16.5	3.5	4.71	371.42%
		5mg	2	7.1	1.8	3.94	294.44%
5	Omeprazole	20mg	48	8.6	1	8.6	760%
		10mg	6	7.75	1.791	4.33	332.72%
		40mg	5	12.546	3.9	3.22	221.70%
6	Pantoprazole	40mg	66	13.8	3.15	4.38	338.10%
		20mg	9	10.3	1.8	5.72	472.20%
I Prostaglandin Analogues							
1	Misoprostol	200mcg	4	18.125	13.195	1.37	37.40%
J Anticholinergic Tablet							
1	Propantheline	15mg	4	1.72	0.398	4.32	332.10%
K H2 Blocker Tablet							
1	Cimetidine	200mg	4	1.9	0.74	2.56	156.75%
		400mg	3	3.669	1.398	2.62	162.44%
2	Ranitidine	150mg	10	2.318	0.433	5.35	435.33%
		300mg	5	3.895	0.832	4.68	368.20%
3	Famotidine	20mg	7	0.398	0.155	2.56	156.77%
		40mg	7	2.49	0.267	9.32	832.58%
4	Roxatidine	75mg	2				
5	Lafutidine	5mg	3	4	2.9	1.37	37.93%
		10mg	8	10.335	4.745	2.17	117.80%
L H. Pylori (KIT)							
1	Omeprazole, Amoxicillin, Tinidazole	20/750/500 mg	8	112	18.25	6.136	513.69%
M Ulcer Protective							
1	Bismuth Subcitrate (Colloidal)	120mg	1	192	192	1	0
2	Tripotassium Dicitrate Bismuthate	120mg	1	200	200	1	0
		1g/10ml	2	75	75	1	0
		0.5G/5ml	4	149	119.6	29.4	24.60%
		1g/5ml	2	136.2	80	1.7	70.25%
3	Sucralfate	1G	6	185	56	3.3	230.35%
		1g	5	39.9	6	6.65	565%
N Antacid Combination							
1	Aluminium Hydroxide Gel, Magnesium Hydroxide, Simethicone, Sodium Carboxy Me-	830(10ml)/185/50/100	2	16.383	11.5	1.42	42.50%

	thyl Cellulose						
2	Aluminium Hydroxide, Magnesium Hydroxide, Dimethicone	250/250/50 (5ml) mg	3	15.9	10.486	1.51	51.60%
		200/200/20 (5ml) mg	3	3.308	1.905	1.74	73.60%
		300/250/40 (5ml)mg	2	16.6	9.5	1.75	74.70%
		5/100/125(5ml) mg	2	3.657	1.956	1.7	86.70%
3	Aluminium Hydroxide, Magnesium Hydroxide, Simethicone	400/400/50 mg	2	12.1	6.38	1.9	89.60%
4	Aluminium Hydroxide, Magnesium Hydroxide, Oxethazaine	291/98(5ml)/10mg	3	20.761	8.784	2.36	136.35%
5	Aluminium Hydroxide Gel, Belladonna Extr, Phenobarb	426/10/8mg	2	40	5	8	700%
6	Aluminium Hydroxide, Magnesium Hydroxide, Methylpolysiloxane	250/250/40 mg per 5ml	52	1.004	15.9	15.84	1483.67%

Figure -2 and Figure-3 show percentage cost variation and cost ratio of APD drugs respectively.

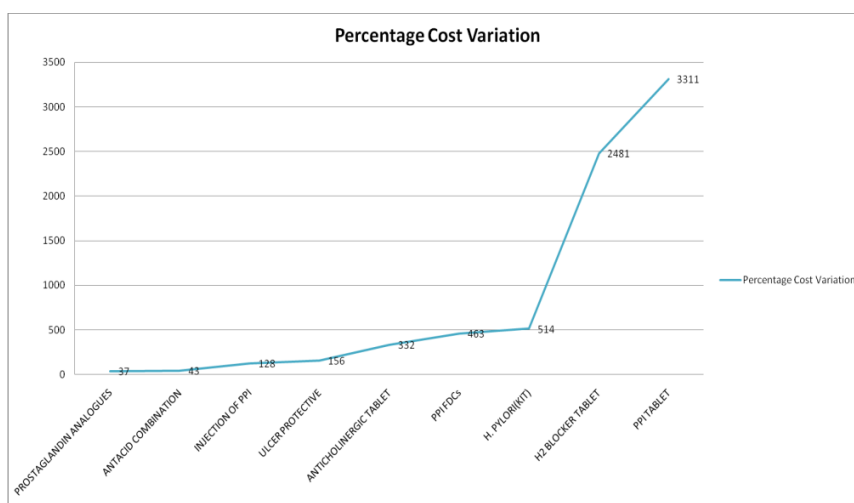


Figure 2: Percentage Cost Variation

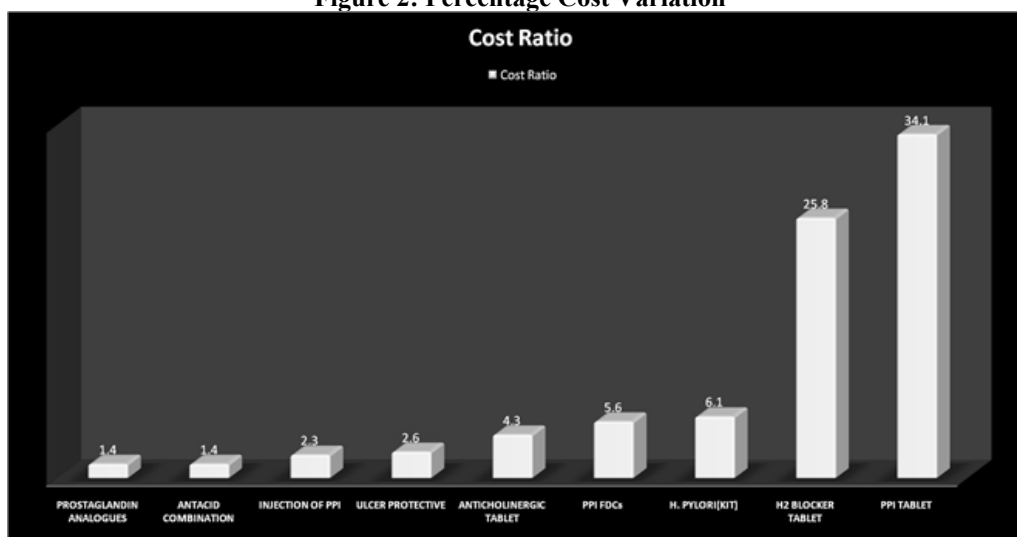


Figure 3: Cost Ratio

Percentage variation in cost among the commonly prescribed drugs for the management of acid peptic disease was found to be highest for Rabeprazole 20 mg tablet (3,311.20%) and Lowest for Lansoprazole 30mg tablet (117.18%) However in Combination drug dosage (FDC) formulations it was highest for Aluminium hydroxide + Magnesium hydroxide + Methylpolysiloxane FDC 250/250/40mg (1483.67%), while it was lowest for Pantoprazole+Levosulpiride FDC 20mg/75mg (0.56%).

Discussion:

Approximately 2 billion people in the developing countries around the world do not have access to drugs. They are not having access to drugs due to low purchasing power of patients and the high cost of the drugs. Indian pharmaceutical market is predominantly a branded generic market, i.e., more than one company sells a particular drug under different brand names apart from the innovator company. Therefore, the number of pharmaceutical drugs available in the market also is very high. This condition has led to greater price variation among drugs marketed [8]. Ultimately, it can lead to poor patient compliance, especially in case of drugs such as acid peptic disease which needs prolonged therapy. Poor patient compliance is a worldwide problem and can result in patients receiving inadequate doses of medication [9]. The drug prices available in Indian Drug Review (IDR) are compared as it is a readily available source of drug information and is updated regularly

In the developing countries like India, where patients have become victims of the expensive medical bills for which they have to spend from their own pockets, unlike developed countries where insurance schemes cover the medical bill expenses. It is felt that practitioners could provide better services and minimize costs of drugs if they have knowledge about various prices of the drugs of different companies.

Drug Price Control Order (DPCO) and the National Pharmaceutical Pricing Authority (NPPA) are effective tools for regulation of drug prices. DPCO is an order issued by the government to fix prices of drug. Drugs which come under DPCO cannot be sold at a price higher than that fixed by the government. In India, in 1979, 80–85% of the drugs in the market were under price control. The number has slowly decreased, and by 2002, only 15–20% of drugs were under price control [10]. Ceiling price of drugs is fixed by NPPA, Government of India in accordance with DPCO. The price of drugs is revised every year according to wholesale price index. The manufacturers may increase the maximum retail price of scheduled formulations once in a year, in the month of April on the basis of the wholesale price index with

reference to the previous calendar year, and no prior approval from the government is required [11]. This study is taken up with the objectives of knowing the costs and percentage price variation among APD drugs which are being manufactured by different companies in India. Even the cost ratio was also noticed to be high [12]. The highest percentage cost variation was observed for tablet Rabeprazole 20 mg (3,311.20%) and lowest percentage cost variation was for tablet Lansoprazole 30mg (117.18%). Among different APD drug, Fixed drug dosage (FDC) formulations it was highest for Aluminium hydroxide + Magnesium hydroxide + Methylpolysiloxane FDC 250/250/40mg (1483.67%), while it was lowest for Pantoprazole+Levosulpiride FDC 20mg/75mg (0.56%).

Higher medication costs have been found to be a reason for medication non-adherence and have been found to be related to adverse health outcomes. Non-compliance of the drug therapy results in progression of the disease which increases the overall medical care costs dramatically. Treatment with generic drugs has been found to have fewer adverse clinical outcomes and improved treatment adherence than treatment with brand name versions. The costly brand of same generic drug is scientifically proved to be in no way superior to its economically cheaper counterpart [13].

The limitation of the study is that sources of information were limited to IDR & MIMS, but there are few other brands which are marketed in India but not published in the above-mentioned source. [14,15]

Conclusion

Wide differences exist in the costs of various drug formulations used to treat acid peptic disease that are available in the Indian market. The prescribing physician should be aware of these variations and prescribe medicines accordingly, keeping in mind the financial status of the patients. Increased adherence to the treatment can be achieved by decreasing expensive treatment strategy and switching to cost-effective therapy. To overcome the disadvantage of cost variation of the drugs, generic prescribing should be encouraged. Cheaper generic medications should be prescribed by the practitioners.

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