

Study of variation in price of various antidiabetic drugs available in Indian market

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Received: 12 November 2014

Accepted: 16 December 2014

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ABSTRACT

Background: Diabetes mellitus in early age is on the alarming rise in India, requiring lifelong treatment. There is a wide range of variation in the prices of antidiabetic drugs marketed in India. Hence, we decided to study price variations in the oral antidiabetic drugs available, either singly or in combination, and number of manufacturing companies for each, and to evaluate the difference in cost of different brands of same active drug by calculating percentage variation of cost.

Methods: Cost of a particular drug being manufactured by different companies, in the same strength and dosage forms was obtained from “Current Index of Medical Specialties” July-October 2014 and “Indian Drug Review” July 2014. The difference in the maximum and minimum price of the same drug, manufactured by different pharmaceutical companies and percentage variation in price was calculated.

Results: Percentage price variation among different group of drugs was found to be as follows: in sulfonylureas, it was highest in glimepiride 2 mg 836.44%, among biguanides - metformin 500 mg 245.55%, among thiazolidinediones-pioglitazone 15 mg 600%, among α glucosidase inhibitors - voglibose 284.61% and meglitinides - repaglinide 0.5 mg 181.40%. Among combination therapy glimepiride 1 mg + metformin 500 mg 366.66%, pioglitazone + metformin 207.51%, pioglitazone + glimepiride 268.42% showed maximum variation in price.

Conclusion: The average percentage price variation of different brands of the same oral antidiabetic drug manufactured in India is very wide. The appropriate changes in the government policy, sensitizing the prescribers about cost of therapy and proper management of marketing drugs should be directed toward maximizing the benefits of therapy and minimizing negative economic consequences.

Keywords: Price variation, Antidiabetic drugs, Branded generics

INTRODUCTION

In the WHO Guide to Good Prescribing, “p” stands for personal (although it could equally be “preferred”), implying that a prescriber has a personal formulary of drugs selected on a rational basis, considering the efficacy, safety, suitability and cost of available drugs for a particular condition. While prescribing to patients of any condition in the future, if the list of drugs, covering all aspects is known beforehand, appropriate drug will be prescribed by the physician. Prescriber also considers what alterations might be needed to the standard dose, frequency or route of administration, and whether it is cost effective for patient or not. In pharmacology curriculum, although a lot is taught regarding the first three aspects i.e. efficacy safety and suitability, the cost factor is often neglected. With the growth of Indian pharmaceutical industry, Indian market is flooded with branded generic drugs with a lot of variation in the cost of

different brands of the same formulation. Doctors prescribe, patients consume and, increasingly throughout the world, patients, government and insurances company pay the bill. This money is fetched by the insurance companies, from reluctant healthy members of the society.¹

High cost of medicines is a burden on the patient, especially for the treatment of chronic disorder like diabetes. High cost of medicines is one of the important reasons for the noncompliance by the patient, thus leading to poor control of blood sugar level and increasing the morbidity associated with the diabetes. Hence, cost of therapy should be an important consideration in selecting the antidiabetic drug therapy. Prices of the antidiabetic drugs vary a lot and prescribing a cheaper brand will be an economically viable option to the patient, leading to increased adherence to therapy in the long-term treatment of diabetes. on the bio-equivalence data. Generic drugs are widely believed to

be bio-equivalent and they have same therapeutic effects as the innovator products.²

Diabetes is the most common noncommunicable disease worldwide. The International Diabetes Federation (IDF) estimates the total number of diabetic subjects to be around 40.9 million in India and this is further set to rise to 69.9, by the year 2025.^{3,4} Selection of oral antidiabetic agents, as first-line monodrug therapy or combined therapy should be based on both, the pharmacological properties of the compounds (efficacy and safety profile) and the clinical characteristics of the patient (stage of disease, body weight, etc).⁵ In the Indian market, various antidiabetic drugs of various brands are available. This creates a lot of problem for the physician, to decide the drug of choice for individual patients, keeping in mind, the socio-economic status of the patient. Furthermore, in literature very less studies are available, which compare the cost of drugs of different brands.

Drug price control order (DPCO) is an order issued by the government, to fix prices of drug. Once medicine is brought under DPCO, it 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% drugs were under price control.⁵ The common man, therefore, has to shell out more money with medicine prices, which ultimately crawl out of his reach.

Prices of only 74 bulk drugs and formulations (about 15-20%) from National List of Essential Medicines are under price control regime of DPCO 2013⁶ (until December 2013). Unfortunately, none of the antidiabetic combination features in the list. The current study aims to project a representative view of the existing situation of antidiabetic drugs, by collecting data about the cost of common oral antidiabetic drugs available either singly or in combination, number of manufacturing companies for each and, to

evaluate the difference in cost of different brands of same active drug by calculating percentage variation of cost.

METHODS

1. Cost of a particular drug (cost per 10 tablets), in the same strength and dosage forms being manufactured by different companies was obtained from "Current Index of Medical Specialties" (CIMS) July-October 2014 and "Indian Drug Review" (IDR) July 2014
2. The drugs being manufactured by only one company or being manufactured by different companies; however, in different strengths were excluded
3. Difference between the maximum and minimum cost of the same drug manufactured by different pharmaceutical companies was calculated
4. Percentage cost variation⁷ was calculated as follows:

$$\text{Cost variation (\%)} = \frac{\text{Max cost} - \text{Min cost}}{\text{Min cost}} \times 100$$

RESULTS

The prices of total 17 drugs (10 single and 7 combination preparations), available in 70 different formulations were analyzed. These 70 formulations are manufactured by different pharmaceutical companies.

Single drug preparation

In single drug therapy, Table 1 shows the price variation between sulfonylurea group of antidiabetic drugs. In this group, glimepiride (2 mg) shows maximum price variation of 836.44 while glipizide (10 mg) shows the least variation of 55.61%. Table 2 shows price variation in biguanides (metformin) and thiazolidinediones (pioglitazone) groups of drugs. In these groups, metformin (500 mg) and pioglitazone

Table 1: Price variation among various drugs of sulfonylurea group of antidiabetic drugs.

Drug	Formulations	Dose (mg)	Manufacturing companies	Min	Max	% Price variation (Rs.)
Glibenclamide	2	2.5	6	2.6	6.5	150
		5	9	3.6	10.91	203.05
Gliclazide	4	30	10	19	76	300
		40	17	15	50	233.33
		60	7	39	96.8	148.2
		80	32	19.5	79.5	307.69
Glimepiride	4	1	77	8.36	62.48	647.36
		2	79	12.54	117.43	836.44
		3	15	20.95	104.2	397.37
		4	21	18.81	133.3	608.66
Glipizide	3	2.5	6	2.97	9.35	214.81
		5	14	4.36	13.03	198.85
		10	4	12.21	19	55.61

(15 mg) show maximum price variation of 245.58% and 600% respectively. Table 3 shows the price variation between various α -glucosidase inhibitor group of antidiabetic drugs. In this group, voglibose shows maximum price variation of 284.61%. Table 4 shows the price variation between meglitinides group of drugs. In this group, repaglinide (0.5 mg) shows maximum price variation of 181.40%.

Combination drug preparation

Table 5 shows price variation in combination drug preparations in which, total seven combinations were analyzed. In this, glimepiride and metformin (1 + 500)

combination shows the maximum variation up to 366.66% and glipizide and metformin (2.5 + 400) showed minimum price variation of 1.15%.

DISCUSSION

Indian 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. Hence, the number of pharmaceutical products available in the market also is very high in the range of 60,000-70,000 products. This situation has led to greater price variation among drugs marketed.^{8,9}

Table 2: Price variation among various drugs of biguanide and thiozolidinedione group of anti-diabetic drugs.

Drug	Formulation	Dose (mg)	Manufacturing companies	Min price	Max price	% Price variation (Rs.)
Metformin	11	250	5	5.1	9.4	84.31
		500	31	6.8	23.5	245.58
		500 (ER)	5	13	31.23	140.23
		500 (SR)	23	9.3	24.9	167.74
		500 (FC)	2	7	7.4	5.71
		850	11	11	25	127.27
		850 (ER)	2	25.2	26.35	4.56
		850 (SR)	2	20	36.5	82.5
		850 (FC)	3	10.6	18.6	75.47
		1000	20	14.6	42.9	193.83
		1000 (SR)		17.5	55.15	21.51
Pioglitazone	2	15	35	10	70	600
		30		18	112	522.22

Table 3: Price variation among various drugs of α glucosidase inhibitor group of antidiabetic drugs.

Drug	Formulation	Dose (mg)	Manufacturing companies	Min price	Max price (Rs.)	% Price variation (Rs.)
Miglitol	4	25	5	50	63.58	27.16
		50	5	90	108	20
		25 (FC)	3	50	78.7	57.4
		50 (FC)	3	90	147.47	63.85
Voglibose	2	0.2	26	19.5	75	284.61
		0.3	25	29.5	110	272.88
Acarbose	2	25	9	42	70	66.66
		50	15	68.5	120	75.18

Table 4: Price variation among various drugs of meglitinide group of antidiabetic drugs.

Drug	Formulation	Dose (mg)	Manufacturing companies	Minimum price	Maximum price	% Price variation (Rs.)
Repaglinide	3	0.5	8	19.9	56	181.4
		1	8	39	92	135.89
		2	6	75	142	89.33

Table 5: Price variation of fixed dose combination of antidiabetic drugs.

Drug	Formulations	Dose (mg)	Manufacturing companies	Minimum price	Maximum price	% Price variation (Rs.)
Glibenclamide+Metformin	4	1.25+250	3	12.5	22	76
		2.5+400	11	7.3	27	269.86
		5+500	20	9.9	30	203.03
		5+500 (SR)	3	29.9	31.96	6.88
Gliclazide+Metformin	6	30+500	2	25.75	40.76	58.29
		40+400	2	28.3	33	16.6
		40+500	3	35	60	71.42
		60+500	2	39.25	58.3	48.53
		80+500	49	21	92.5	340.47
		80+500 (SR)	4	51	60.5	18.62
Glimepiride+Metformin	9	1+500	19	12	56	366.66
		1+500 (ER)	11	30.6	80.3	162.41
		1+500 (SR)	31	20.2	88.5	338.11
		1+1000 (SR)	6	46.16	80	73.31
		2+500	19	25	69	176
		2+500 (FC)	2	50	51	2
		2+500 (SR)	34	36	136.99	280.52
		2+850 (ER)	2	65	76	16.92
		2+1000	2	53	128	141.5
Glipizide+Metformin	2	5+500	7	6.72	14	108.33
		2.5+400	2	5.2	5.26	1.15
Pioglitazones+Metformin	5	15+500	12	27.3	77	182.05
		15+500 (ER)	8	34	61	79.41
		15+500 (SR)	10	21.3	65.5	207.51
		30+500 (ER)	6	34	97	185.29
		3+500 (SR)	9	32.4	86.2	166.04
Pioglitazone+Glimepiride	3	15+1	9	19	70	268.42
		15+2	15	30.9	75	142.71
		30+2	2	69	80	15.94
Pioglitazone+Metformin+ Glimepiride	4	15+500 (SR)+1	11	30.2	67.5	123.5
		15+500 (ER)+1	7	41.9	77.9	85.91
		15+500 (SR)+2	10	40.4	75	85.64
		15+500 (ER)+2	7	54.48	117.9	116.4

Very few studies are available in Indian scenario, which compare the cost of drugs of different brands.^{9,10} The drug prices available in CIMS and IDR were compared as they are readily available source of drug information and are regularly updated. Drugs used in the management of diabetes were selected, as it is one of the major causes of morbidity and mortality, and the treatment requires continuous drug therapy, as prescribed by doctors.

Our findings reveal that, the prices of most of the antidiabetic brands have percentage price variation above 100%, which is not acceptable situation for patients. Of 17 drugs studied, most of which are commonly prescribed, percentage price variation is very wide leading to the unnecessary burden on

the consumer. This price variation was high in glibenclamide 2.5 and 5 mg and metformin 5 mg, which are included in the essential drug list (EDL) and also comes under DPCO, thus raising questions about its price control. Furthermore, same finding was present in glimepiride, although it is not included in EDL.

In India, patients are paying out of their pockets for their medical bills and are not covered by insurance schemes, unlike developed countries.¹¹ In this situation, it is prudent to revisit the costing mechanisms and the huge difference between the pricing of brands have to be regulated by concerned agencies. It is felt that prescribers could provide better services and reduce costs of the overall therapy if the

information about drug prices was readily available and teaching P drug concept in the undergraduate level. Studies have shown, that providing a manual of comparative drug prices annotated with prescribing advice to physicians reduced their patient's drug expense.¹² The reasons for this price variation could be as follows:^{9,10,13-16}

1. The existing market structure of the pharmaceutical industry
2. Asymmetry of information or imperfect information
3. Government regulations and pricing policies
4. Costs of raw supplies, distribution and promotion
5. Economic goals of the parent company, target return on investment
6. Sensitizing the prescribers about cost of therapy.

Currently, very few medicines are under drug prices control order. Hence, it is desired that the Government should bring all lifesaving and essential medicines under price control. Combinations of antidiabetic drugs are not included in EDL which should be taken into consideration while revising the list. Due consideration must be placed on the pricing of drugs in the EDL to increase their accessibility to common people. DPCO appears to be an effective tool to keep in rein the drug prices, which should be implemented for all drugs included in EDL in effective way. If prescribers are sensitized regarding the cost factor in their undergraduate level and also providing a manual of comparative drug prices to the prescribers would also lead to cost effective therapy to the patients.

Thus, this study highlights that there is a huge price variation among the antidiabetic drugs manufactured by different companies. Some measures must be taken by the government to bring about the uniformity in the price. It will help to reduce the economic burden on the patients to some extent, and it also may ease physician's dilemma, of prescribing efficacious, safe and cost effective drug to match socio-economic status of the patient.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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doi: 10.5455/2319-2003.ijbcp20150202

Cite this article as: Date AP, Mahajan HM, Dashputra AV, Bhosale RR. Study of variation in price of various antidiabetic drugs available in Indian market. Int J Basic Clin Pharmacol 2015;4:36-40.