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Cost Analysis of Generic vs Branded Anti-Diabetic Drugs in the Indian Pharmaceutical Market.

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ABSTRACT

Diabetes Mellitus (DM) is a long-standing condition that impacts a large number of individuals worldwide. Treatment often involves taking medication for an extended period, and in some cases, for a lifetime. The cost of medications for this disease can vary significantly between India and other countries around the world. There have been limited studies conducted to investigate the extent of these price differences in the open market. The aim is to compare the prices of oral anti-diabetic drugs belonging to generic classes and different brand name of the same active compound. Additionally, we want to calculate the percentage variation in the cost of different brands with generic drug of the same active compound to evaluate the cost difference. A comparison was made between the cost of a specific medication produced by different pharmaceutical companies, in identical strength, quantity, and dosage form, against a generic drug. The price range between the highest and lowest cost of the same medication produced by various pharmaceutical companies was determined, as well as the percentage difference in price between branded and generic drugs. Various categories of medications used to treat diabetes exhibit a significant variation in their costs. The prices of certain diabetes medications vary greatly. Glimepiride and Pioglitazone have the highest price variations in their respective categories, while Acarbose and Teneligliptin have the least. Glimepiride + Metformin SR has the highest price variation in fixed dose combination, and Glibenclamide + Metformin has the least.

Keywords: Cost Analysis, Generic vs Branded Anti-Diabetic Drugs, Indian Pharmaceutical Market.

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BACKGROUND

Type 2 diabetes is a widespread non-communicable disease across the globe, affecting over 77 million people above the age of 18 in India. Additionally, 25 million people are prediabetic, putting them at a higher risk of developing diabetes in the near future. Unfortunately, over 50% of people are unaware of their diabetic status, which can lead to severe health complications if not detected and treated early [1]. Effective management of diabetes requires lifestyle adjustments and pharmaceutical therapy to achieve excellent metabolic control and maintain it over time. Physicians commonly use oral hypoglycemic agents (OHAs) to treat type II diabetes. However, patients who cannot achieve treatment objectives with first-line OHAs as monotherapy are often prescribed dual medication regimens. In India, anti-diabetic medications are available in various doses and at different prices, making it challenging for physicians to select the most cost-effective prescription for their patients. This increased cost variety leads to worse compliance and lower quality of life, further increasing the financial burden on patients. A cost-effective analysis of anti-diabetic treatments is necessary in clinical practice to develop a more cost-effective treatment regimen and increase patient compliance, reducing the risk of therapy failure. As literature on cost-effective analysis of anti-diabetic treatments is scarce, this research aims to analyze the cost differences between different anti-diabetic medication brands and generics currently available in the Indian pharmaceutical.

METHODOLOGY

The data collected from medicine department of tertiary care hospital. the data consisted of brands and generic drug along with contents, dosing. Data about the cost of anti- diabetic drugs was collected for all the strengths and dosage form which are listed in PMBJP (Pradhan Mantri Bhartiya Janaushadhi Pariyojana and Indiabulls pharmaceuticals Rx and drugs which are available in market and compared with each other.

- Cost of a particular drug (per 10 tablets) of various strength and dosage forms being manufactured by different companies was compared with generic drugs.
- Difference between the maximum and minimum cost of same drug was calculated which are manufactured by different companies.
- Percentage price variation was calculated between branded and generic drugs [3].

Following formula was used to calculate price variation

$$\text{Percentage price variation} = \frac{\text{Cost difference in branded drugs – price of generic drug} * 100}{\text{Price of generic drug}}$$

Table 1

	Drugs Name	Strength	Generic Price	Min	Max	Difference (Max-Min)	%
	Sulfonylureas						
1	Glibenclamide	2.5 mg	2.6	7	27	20	669%
2	Glibenclamide	5 mg	4.05	9	30	21	419%
3	Gliclazide	40 mg	11.93	9.13	62	52.87	343%
4	Gliclazide	80 mg	20.25	40	106	66	226%
5	Glimepiride	1mg	4.38	17.5	41.44	23.94	447%
6	Glimepiride	2mg	5.05	30.53	64.85	34.32	580%
7	Glipizide	5 mg	2.5	3.38	11	7.62	205%
8	Gliclazide SR	60 MG	38	42	163	121	218%
9	Glimepiride	3mg	5	35	150	115	2200%
10	Glimepiride	4mg	6	40.2	186	145.8	2330%
	Biguanide						
1	Metformin Hydrochloride SR	1000 mg	11.05	25	67.93	42.93	289%%
2	Metformin hydrochloride	500 MG	8.85	6.45	44	37.55	324%
3	Metformin SR	850mg	15	10.85	38	27.15	81%

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Thiazolinedione							
1	Pioglitazone	15 mg	6.75	5	130	125	1752%
2	Pioglitazone	30 mg	10.69	10	135	125	1069%
3	Teneligliptin	20mg	49.5	60	199	139	181%
Glucosidase inhibitor							
1	Voglibos	0.3 mg	12.75	36.2	129	92.8	628%
2	Acarbose	50 MG	55.9	65	130	65	16%
3	Voglibose	0.2 mg	10	27.4	107.5	80.1	701%
FIXED DOSE COMBINATION							
1	Metformin SR +Pioglitazone	500mg + 15 mg	20	58	220	162	710%
2	Glimepiride + Metformin SR	2 mg + 500 mg	12	60	157	97	708%
3	Gliclazide + Metformin	80 mg + 500 mg	35.1	52	226	174	396%
4	Glibenclamide + Metformin	5mg+ 500 mg	10.34	16.5	47.5	31	200%
5	Metformin SR + Glimepiride	1000mg + 2mg	18.23	45.1	145	99.9	448%
6	Glimepiride + Metformin SR	1mg + 500mg	7	22.2	109	86.8	1140%
7	Glimepiride + Metformin Hydrochloride	2mg + 1g	29.7	45.1	143.25	98.15	230%
8	Voglibose + Metformin SR	0.2mg +500mg	13.97	30.48	155	124.52	791%
9	Voglibose + Metformin	0.3 mg + 500mg	13.7	52	126.65	74.65	445%

RESULTS

In the cost comparison of various anti-diabetic drugs, Table 1 depicts the cost variation amongst different brands and generic drug. It was observed that the number of brands present varied from 5 to a maximum of 75 with 73 having the most number of brands. There was a significant difference in prices between the different available brands and generics. There is a significant price variation observed in different types of medications used to treat diabetes. For instance, in sulfonylureas, glimepiride [2330%] had the highest price variation, while glipizide [205%] had the least. In Biguanide, Metformin Hydrochloride 500mg [324%] had the maximum price variation, and metformin SR 850mg [81%] had the least. Pioglitazone 15mg [1752%] had the highest price variation in Thiazolidinediones, while Teneligliptin [181%] had the least. In Glucosidase inhibitor, Voglibose 0.2 mg [701%] had the maximum price variation, and Acarbose [16%] had the least. Lastly, in fixed drug combination, Glimepiride + Metformin SR [1140%] had the highest price variation, and Glibenclamide + Metformin [200%] had the least [3, 4].

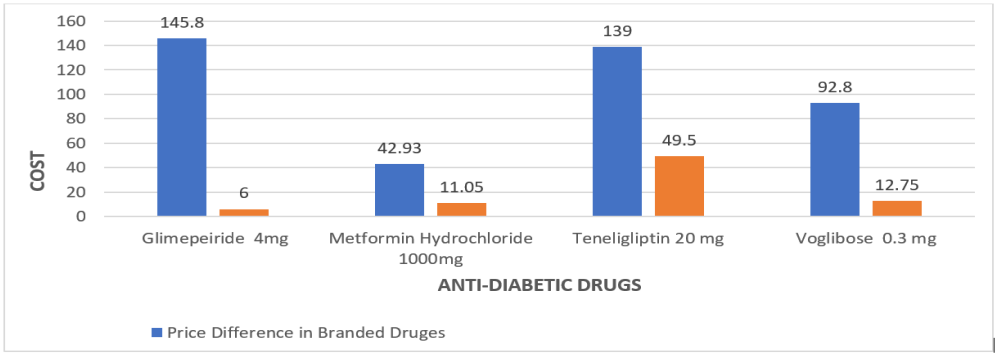

Figure 1: Graph showing relationship between cost of brands (difference between maximum and minimum price) and generic drug

DISCUSSION

Pharmacoeconomics is a field of study within health economics that is concerned with evaluating the cost-effectiveness of drug therapies. Its primary objective is to inform decision-making regarding resource allocation and planning processes. Healthcare institutions, both public and private, aim to reduce drug-related expenses as a means of cutting down on overall healthcare costs.

There is a lack of research on cost analysis in the medical field. It is crucial for physicians to have knowledge about the price of drugs to ease the financial burden on patients. However, there is a shortage of studies on this topic. As a result, we decided to conduct our own research on the matter.

Drug Prices are controlled according to drug price control act 2022[DPCA]. Ceiling prices of Drugs are fixed by national pharmaceutical pricing authority [NPPA] Government of India in accordance with DPCO 2023. So far it has the Fixed Ceiling Pricing of 476 Drug Formulation Included in national list of Essential Medicines [5].

Limitations

Studies on the cost analysis of different brands of antidiabetic drugs are available. However, there are no further studies available that compare generic drugs to branded drugs. Therefore, we plan to conduct such a study. Additionally, there is a need for more research on this topic.

CONCLUSION

The price variation in percentage of various brands of the same drug manufactured in India and generics is quite significant. It is crucial to educate people that less expensive and generic drugs are not of inferior quality compared to their more expensive branded counterparts [2]. Therefore, it is recommended that the evaluation and management of marketing drugs should focus on maximizing the benefits of therapy and minimizing negative personal and economic consequences [3].

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