

## Cost Analysis of Antiepileptic Drugs of Different Brands Available in India



Pharma

**KEYWORDS :** Antiepileptic, Cost analysis, Generic prescribing.

**Dr. Siddharth Banode**

Assit. Professor, Pharmacology, R. D. Gardi Medical College, Ujjain, India.

**Dr. Ashutosh Chourishi**

Professor & Head, Pharmacology, R. D. Gardi Medical College, Ujjain, India.

### ABSTRACT

*Epilepsy is a chronic disease for which patients has to take medications for a prolonged period and even sometimes lifelong medications are required to treat this disease. Costly brand of medications if prescribed in such cases adds to the burden of disease and may even lead to failure of compliance of therapy. Hence the study was designed to evaluate the cost of antiepileptic drugs of different brand names and to analyze price variation among various antiepileptic drugs available in Indian market. Methods: Prices of various drugs marketed by different companies was obtained from IDR. The variation between highest and lowest price of the same medication manufactured by various pharmaceutical companies and percentage variation in cost for ten tablets was calculated. Results: Cost analysis of total 17 anti epileptic drugs was done. These drugs were available in the market as 163 different formulations, manufactured by different pharmaceutical companies. Percent variation in cost was found to be highest, for the drug Carbamazepine (1100%) of which there were 22 brands followed by Acetazolamide (1037.8%), of which there were only 3 pharmaceutical brands. Lowest percent variation in cost was of Zonisamide (18.46%), with 3 pharmaceutical preparations. Conclusion: To increase the benefit on patient counterpart, generic drug prescribing or prescribing cheaper medications of same strength should be encouraged among practitioners.*

### INTRODUCTION:

Cost of therapy is a major concern to both physician and patient in a developing country like India, which also affects compliance of therapy<sup>(1)</sup>. Indian pharmaceutical industry is growing at a tremendous pace, at present globally ranked third by volume and thirteen largest in terms of value<sup>(2)</sup>. The market is dominated majorly by branded generics which constitute three-fourth of the market<sup>(3)</sup>.

In our country different brands of the same drug are available with huge price variations. The cost of drug plays a crucial role in patients care especially in developing countries and constitutes an essential part of rational drug prescription<sup>(4)</sup>. In India, most of the drugs are available in brands and these are also prescribed by clinician mostly in brand name.

Epilepsy is a chronic disease for which patients has to take medications for a prolonged period and even sometimes lifelong medications are required to treat this disease. Costly brand of medications if prescribed in such cases adds to the burden of disease and may even lead to failure of compliance of therapy. Hence the study was designed to evaluate the cost of antiepileptic drugs of different brand names and to analyze price variation among various antiepileptic drugs available in Indian market.

### MATERIAL & METHODS:

IDR, Drug triple I compendium, 2015 issue 5 was used as the reference source of information to review the prices of drugs used in the treatment of epilepsy. Following were the criterion used for collecting the information:

1. Oral drug formulations with same strength, dose and number were included for the study.
2. Only, oral drug formulations were included in the study, injectable preparations if any were discarded from the study.
3. Drug formulations of varying strength and drug manufactured by single company and with no cost information were excluded from the study.
4. Fixed dose combinations (FDC's) were not included in the study
5. Cost of antiepileptic drugs was calculated on an average for ten tablets and number of tablets available per strip differed.

6. Maximum and minimum drug cost for the same formulation manufactured by different pharmaceutical companies were noted. The variation between the two was considered.

7. Percentage cost variation was calculated as follow<sup>(3,5)</sup>:

$$\% \text{ Cost Variation} = \frac{\text{Maximum Cost} - \text{Minimum Cost}}{\text{Minimum Cost}} \times 100$$

### RESULTS:

Cost analysis of total 17 anti epileptic drugs was done. These drugs were available in the market as 163 different formulations, manufactured by different pharmaceutical companies.

Table 1 shows variation in costs of anti-epileptic drugs. Percent variation in cost was found to be highest, for the drug Carbamazepine (1100%) of which there were 22 brands followed by Acetazolamide (1037.8%), of which there were only 3 pharmaceutical brands. Lowest percent variation in cost was of Zonisamide (18.46%), with 3 pharmaceutical preparations.

**Table 1. Variation in cost of antiepileptic drugs.**

Drug	Dose(mg)	Number of brands	Minimum cost(INR)	Maximum Cost(INR)	%Variation in cost
Acetazolamide	250	3	06.90	78.50	1037.8
Carbamazepine	200	22	10.00	120.00	1100
Clobazam	10	9	43.00	106.37	147.37
Clonazepam	1	25	12.50	36.00	188
Diazepam	5	13	07.00	33.21	374.42
Divalproex sod.	500	26	32.00	88.55	176.71
Gabapentin	300	9	98.75	124	25.56
Lamotrigine	500	7	98.00	158	61.22
Levetiracetam	500	5	105	189	80

<b>Lorazepam</b>	2	12	11.00	35	218.18
<b>Oxcarbazepine</b>	300	11	48.33	75.00	55.18
<b>Phenobarbital</b>	60	2	8.25	28.02	239.63
<b>Phenytoin</b>	100	9	8.36	21.10	152.39
<b>Pregabalin</b>	150	16	82.14	169	105.74
<b>Topiramate</b>	50	4	36	75	108.33
<b>Valproic acid</b>	200	17	19.50	42	115.38
<b>Zonisamide</b>	100	3	87.79	104.70	18.46

### DISCUSSION & CONCLUSION:

In India, more than one pharmaceutical company sells a particular drug under different brand names along with the company that has patent. Hence, a large number of formulations for the same drug are available at different prices. The Indian market has over 100,000 formulations and there is no system of registration of medicines<sup>(6)</sup>. Drugs are mainly sold under brand names<sup>(7)</sup>. Several studies in the western world found drug prices to be high and that price discrimination occurred across the industry<sup>(5)</sup>. However, very few studies are available in Indian scenarios which compare the cost of drugs of different brands. Therefore, we decided to carry out the study, which compares the cost of different brands of drug.

IDR, drug compendium gives substantial updated information about drugs periodically and is readily available at various medical bookstores and is referred by many practitioners for the drug related information. In our study we found that there is huge price variation of antiepileptic drugs when these were considered for cost analysis. Anand Krishnan, Ritvik, Debashish Chowdhary (2007) and Gupta R.K, Reddy P (2011) have also observed a lot of variation in the cost of anti-epileptic drugs<sup>(8, 9)</sup>. Our study is in agreement with their studies.

In our study, we found that highest price variation was for the drug Carbamazepine which goes in flow with the previous study by Gupta R. K , Reddy P(2011)<sup>(9)</sup>. The next drug to follow such huge price variation was Acetazolamide. Zonisamide was the drug found to be lowest price variation among all the antiepileptic drugs.

It has been observed that doctors have suboptimal awareness of drug cost<sup>(10)</sup>. In such situation if costly brands are prescribed patients has to pay unnecessarily and that creates an economic burden and can affect the compliance on the patient counterpart. The situation can be improved if drug cost is given greater emphasis during medical training program of doctors<sup>(11)</sup>. A mention of the drug cost is also required in medical literature and drug advertisement<sup>(9)</sup>.

To counteract such cost variation, the practice of generic prescribing should be encouraged. Generic prescribing not only counteract the cost variation, but also increase the patients compliance to the therapy<sup>(12)</sup>. Generic prescribing should be given greater emphasis and must be inculcated among private practitioners, spreading awareness that cheaper medicines are not inferior to costlier branded counterparts.

### REFERENCE

1. Kuruvilla A, George K, Rajaratnam A, John KR. Prescription patterns and cost analysis of drugs in a base hospital in south India. *Natl Med J India*. 1994; 7(4):167-8. | 2. Sundaram VM. Pharma industry in India. *Drug News Perspect*. 2008; 21(1):59-63. | 3. Akila L, JamunaRani R. Cost analysis of different brands of antianginal drugs available in India. *Int. Journ Basic & Clinical Pharmacology*; 2015; 4(5); 860-863. | 4. Daphne A. Fresle, Cathy Wolfheim. Public Education in Rational Drug Use: a Global Survey. Pg 55-56. | 5. Panchal SS, Pandit PR, Phatak AM, Lohi KM. Cost analysis of antiretroviral agents available in India. *Int. Journ Basic & Clinical Pharmacology*; 2015; 4(3); 479-482. | 6. Shankar PR, Subish P, Bhandari RB, Mishra P, Saha AC. Ambiguous pricing of topical dermatological products: a survey of brands from two South Asian countries. *J Pak Assoc Dermatol*. 2006; 16:134-40. | 7. Monaghan MJ, Monaghan MS. Do market components account for higher US prescription prices? *Ann Pharmacother*. 1996; 30(12):1489-94. | 8. Anand Krishnan, Ritvik, Debashish Chowdhury. Cost of anti-epileptic drugs in India. *Neurology Asia* 2007; 12 (Supplement 1):42-43. | 9. Gupta RK, Reddy PS. A calm look on cost analysis of different brands of antiepileptic drugs. *J MGIMS*, 2011, 16(1), 64 – 66. | 10. Lowy, D.R. Low, L. and Warner, R.S. A survey of physician awareness of drug costs. *Am J Edu* 1972, 47:349-355 | 11. Brody, B.L. and Stokes, J. Use of professional time by internists and general practitioners in group and solo practice. *Ann Intern Med* 1970, 73:741-749. | 12. Steven Reichert, Todd Simon, Ethan A.Halm. Physicians' Attitudes about Prescribing and Knowledge of the Costs of Common Medications. *Arch Intern Med*. 2000, 160: 2799-2803. |