

**Cost variation analysis of various brands of anti-epileptic drugs currently available in Indian pharmaceutical market****Saiyadali A. Allisabanavar\*, Narayana Reddy S.**

Department of Pharmacology,  
Bangalore Medical College and  
Research Institute, Fort, K R  
Road, Bengaluru, Karnataka  
560002, India

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Dr. Saiyadali A. Allisabanavar,  
Email: [saiyadali06bims@gmail.com](mailto:saiyadali06bims@gmail.com)

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**ABSTRACT**

**Background:** Epilepsy is a common neurological disorder affecting about 10 million persons in India. The compliance to a particular antiepileptic drug is highly dependent on the cost of the drug which directly translates into success or failure of therapy. Hence there is a need for all clinicians to keep themselves updated with the latest prices and price variation of the commonly prescribed drugs. This study aims to analyze cost variation of various brands of anti-epileptic drugs currently available in Indian pharmaceutical market.

**Methods:** Current Index of Medical Specialities July-October 2016 edition was referred to know the maximum and minimum price in INR of various brands of anti-epileptic drugs in India. Further analysis was done by using Percentage Cost Variation.

**Results:** There is wide variation in the prices of different brands of same antiepileptic agents in Indian market. The highest % cost variation was found for diazepam 5mg tablet (374.42), followed by lorazepam 2mg tablet (213.63), carbamazepine 100mg syrup/5ml-100ml (172.58), levetiracetam 1000mg FC-tablet (168.57), lamotrigine 25mg DIS-tablet (150), clobazam 10mg tablet (147.37), clonazepam 0.5mg tablet (145.90), oxcarbazepine 150mg tablet (89.46), gabapentin 300mg capsule (71.67), valproic acid 200mg FC-tablet (58.62), divalproex sodium 500mg ER-tablet (47.82), topiramate 50mg tablet (41.66) and lowest % cost variation was of phenytoin sodium 300mg tablet (0.23).

**Conclusions:** The average percentage price variation of different brands of same oral anti-epileptic drug in Indian market is very wide. To counter act such cost variation, physicians should be encouraged to prescribe a medication brand with low cost. This in turn reduces the unnecessary economic burden to the patients.

**Keywords:** Antiepileptic drugs, Cost analysis, Cost variation

**INTRODUCTION**

Epilepsy is the most common neurological condition worldwide affecting people of all ages.<sup>1</sup> It is defined by International League Against Epilepsy (ILAE) as a condition characterized by recurrent (two or more) epileptic seizures, unprovoked by any immediate identified cause.<sup>1</sup> Around 50 million people worldwide have epilepsy with nearly 80% of epileptic patients residing in developing countries.<sup>2</sup> There are about 10 million persons with epilepsy in India with a prevalence of 1%.<sup>3</sup>

Epilepsy is one of the major causes of morbidity, mortality and needs long-term treatment. The treatment of epilepsy is a challenging task while selecting an appropriate drug or a combination of drugs that controls seizures most effectively at an acceptable level of adverse effects, taking into account the cost of the drug. The consideration of medication cost is an important aspect in health economics and plays a crucial role in patient's care especially in developing countries.<sup>4</sup> It is also an essential part of rational drug prescription influencing compliance with treatment.<sup>5</sup>

Availability of anti-epileptic drugs under different dosage forms with different brands with large cost variation in India creates a lot of problems for the physicians in choosing the less costlier drug for individual patients.<sup>3</sup> Due to increased cost variation in the anti-epileptic drugs, there is decreased compliance which in turn increases the seizure frequency and consequently leads to decrease in the quality of life, adding to the economic burden for patients.<sup>6</sup> The awareness of cost variation of anti-epileptic drugs can be applied for more economical treatment regimen to improve the patient compliance and decrease the rate of failure of therapy.

The paucity of literature on cost effective analysis of anti-epileptic drugs implies the need for cost analysis of available formulations of anti-epileptic drugs in the practice of medicine and hence the above study was designed.

This study aims to analyze cost variation of various brands of anti-epileptic drugs currently available in Indian pharmaceutical market.

## METHODS

This was an analytical study. “Current Index of Medical Specialities July-October 2016” edition was referred to analyze the maximum and minimum price in INR (per 10 tablets) of anti-epileptic drugs in all available strengths and dosage forms being manufactured by different companies in India.<sup>7</sup>

Anti-epileptic drug formulations with same strength, dose and number were included for the study. The drugs being manufactured by only one company and fixed dose combinations were excluded.

Further analysis was done by using Percentage Cost Variation of the costliest to cheapest of the various

brands of anti-epileptic drugs. From this we can know that how many times the costliest brand costs more than the cheapest brand in each group.

Percentage cost variation was calculated as follows.<sup>8</sup>

$$\text{Cost variation (\%)} = \frac{\text{Maximum cost} - \text{minimum cost}}{\text{Minimum cost}} \times 100$$

## RESULTS

The prices of anti-epileptic drugs manufactured by different pharmaceutical companies were analyzed. Figure 1 shows percentage cost variation of anti-epileptic drugs used as mono therapy.

The present study showed a very high variation in the maximum and minimum price of anti-epileptic drugs which is being manufactured by several different companies in India (Figure 2).

The cost ratio was also observed to be very high (Figure 3).

There is wide variation in the prices of different brands of same anti-epileptic agents in Indian market. The highest % cost variation was found for diazepam 5mg tablet (374.42), followed by lorazepam 2gm tablet (213.63), carbamazepine 100mg syrup/5ml-100ml (172.58), levetiracetam 1000mg FC-tablet (168.57), lamotrigine 25mg DIS- tablet (150), clobazam 10 mg tablet (147.37), clonazepam 0.5mg tablet (145.90), oxcarbazepine 150mg tablet (89.46), gabapentin 300mg capsule (71.67), valproic acid 200mg FC-tablet (58.62), divalproex sodium 500 mg ER-tablet (47.82), topiramate 50mg tablet (41.66) and lowest % cost variation was of phenytoin sodium 300 mg tablet (0.23).

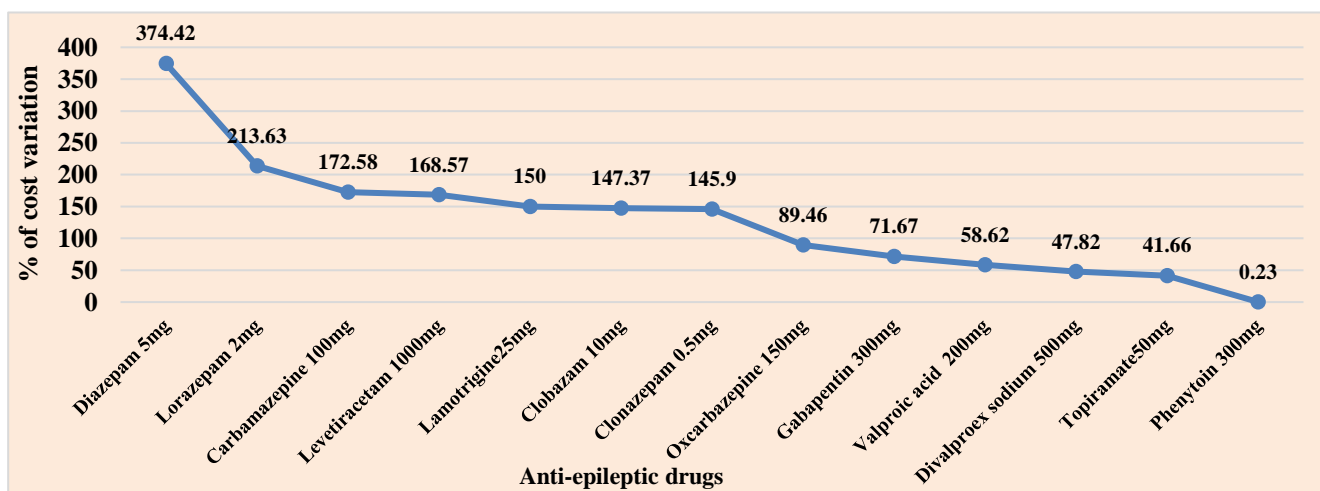


Figure 1: Percentage cost variation of anti-epileptic drugs.

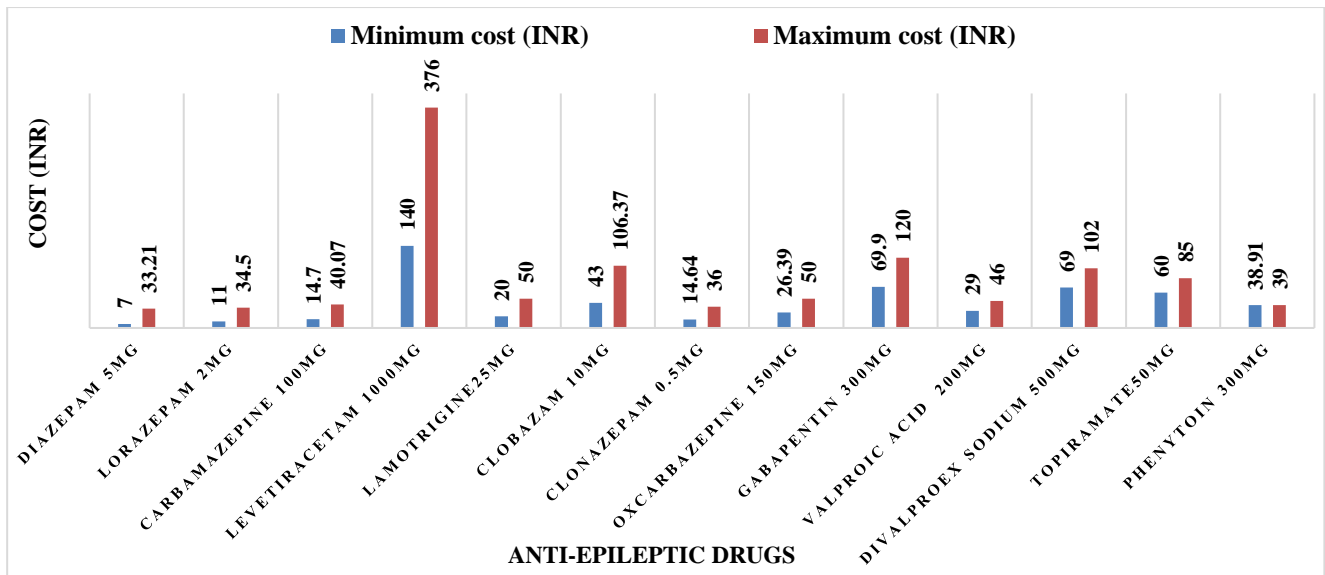


Figure 2: Cost difference [min and max] of anti-epileptic drugs.

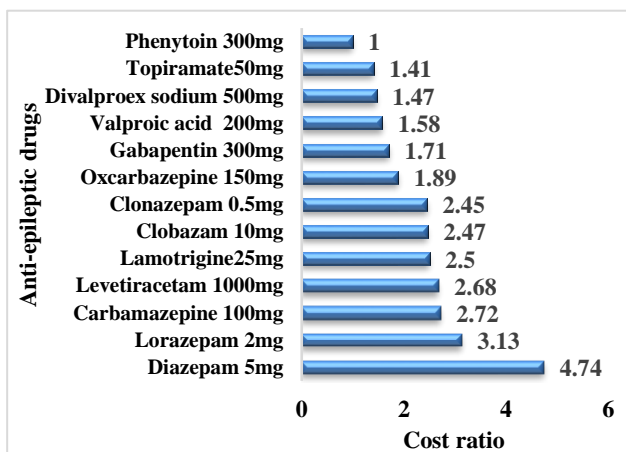


Figure 3: Cost ratio of anti-epileptic drugs.

## DISCUSSION

The present study showed a very high variation in the maximum and minimum price of anti epileptic agents (Figure 1). The percentage variation in the cost was above 100% with most of the anti epileptic drugs (Figure 3) and there is substantial variation in the cost of different brands of same antiepileptic agents in Indian market which is consistent with the results from previous studies.<sup>9-11</sup>

Higher medication costs have been found to be a reason for medication non-adherence,<sup>12</sup> and has been found to be related to adverse health outcomes. Medication noncompliance can be the single most common reason for treatment failure in epilepsy. It has been estimated that up to 60% of patients with epilepsy are noncompliant. Non-compliance of the drug therapy results in progression of the disease which increases the

overall medical care costs dramatically. Treatment with generic anti-epileptic drugs have been found to have fewer adverse seizure-related 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.<sup>13</sup>

Prescribing doctors should pay due importance to the drug prices in a country like India where majority of patients are paying out of their pockets for their medical bills and are not covered by insurance schemes. It has been observed that more than 80% health financing is borne by patients in India.<sup>14</sup> It has been observed that doctors have suboptimal awareness of drug cost. In such situation if costly brands are prescribed patients has to pay unnecessarily more money 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>15</sup>

Currently, very few medicines are under drug prices control order. Government should bring more number of antiepileptic drugs under price control. Due consideration must be placed on antiepileptic drugs to increase their accessibility to common people. Drug Price Control Order (DPCO) and the National Pharmaceutical Pricing Authority (NPPA) are effective tools for regulation of drug prices.<sup>16-18</sup> Thus, this study highlights that there exists a huge and variable price variation among the antiepileptic drugs manufactured by different companies and thus strong measures must be taken by the government and concerned agencies for uniformity in drug pricing.

The limitation of the study is that sources of information were limited to CIMS but there are few other brands which are marketed in India but not published in the above mentioned source.

## CONCLUSION

The present study findings showed a wide variation in the prices of different brands of same anti epileptic drugs currently available in Indian market. Increased adherence to the treatment can be ensured by decreasing the cost of therapy, by changes in the government policies and regulations and creating awareness among treating physicians for switching to cost effective therapy and thus help in rational prescribing.

To counteract such cost variation, the practice of generic prescribing should be encouraged. Prescribing of cheaper medications should be given greater emphasis among practitioners. Also spreading awareness that cheaper medicines are not inferior to costlier branded counterparts.

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