



Study of Cost - Analysis of Commonly Used Oral Sedative - Hypnotics in India

KEYWORDS

Sedative-hypnotics, Cost analysis, Cost ratio.

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ABSTRACT Background: In clinical therapeutics, Sedative-hypnotics are useful for treatment of a variety of diseases related to the central nervous system, such as acute and chronic anxiety, anesthesia, seizure control, and insomnia. There is a wide variation in the prices of oral Sedative-hypnotics marketed in India. Thus, a study was planned to find out the variation in cost of the commonly used oral Sedative-hypnotic drugs available in India as a single drug to evaluate the difference in cost of various brands of the same Sedative-hypnotics by calculating percentage variation in cost.

Methods: Cost of commonly used oral Sedative-hypnotics manufactured by different pharmaceutical companies, in the same strength and dosage forms was obtained from "Current Index of Medical Specialties" October 2015- January 2016. The difference in the maximum and minimum price of the same drug manufactured by different pharmaceutical companies and percentage variation in cost per 10 tablets was calculated.

Results: The study shows that there is a noticeable variation in the prices of different brands of same Sedative-hypnotics in Indian market. The highest cost variation (415.1%) is found for Zolpidem 5.0 mg tablet, followed by Diazepam 5.0 mg tablet (374.4%). Other significant cost variations are: Alprazolam 1.0 mg (360.0%), Alprazolam 0.25 mg (313.7%), Diazepam 10.0 mg (308.5%), Diazepam 2.0 mg (304.0%) and Lorazepam 1.0 mg tablet (284.6%) The lowest percent cost variation found is of Zopiclone 7.5 mg (3.4%) followed by Eszopiclone 2.0 mg (4.9%) and Clobazam 20.0 mg (7.9%).

Conclusion: There is a wide difference in the cost of different brands of oral Sedative-hypnotic drugs available in India. The clinicians prescribing these drugs should be aware of these variations in cost to reduce the cost of drug therapy thereby increasing patient compliance.

INTRODUCTION

Insufficient sleep is one of the most common health complaint encountered. More than one and half of the adult population in the USA experience intermittent sleep disturbance or occasional night of poor sleep or daytime sleepiness. A study has recently stated that 1 in 20 Indians suffer from sleep disorders [1]. Sedative-hypnotics are drugs that limit excitability (sedation), and/or induce drowsiness and sleep (hypnosis) [2].

In clinical therapeutics, sedative-hypnotics are useful for treatment of a variety of diseases related to the central nervous system, such as acute and chronic anxiety, anesthesia, seizure control, and insomnia [2].

The Sedative-hypnotics may be divided into three major groups: (1) Benzodiazepines, (2) Barbiturates, and (3) Miscellaneous drugs- Z drugs, Ramelteon etc. [3]. Among all these, the most commonly used ones in a clinician's day to day practice are Benzodiazepines and Z drugs. Barbiturates are not used nowadays [4]. Since insomnia is one of the prevalent diseases in India, a patient suffering from chronic insomnia may need to take hypnotics on regular basis. Many cases of insomnia also suffer from other comorbid conditions like hypertension, diabetes or dyslipidemia. Treatment of these conditions adds to financial burden on the patient [1].

The current scenario shows that the Indian pharmaceutical field is the third largest with respect to volume and is the thirteenth largest in terms of value [5]. Needless to say there will be a wide variation among the costs of generic Sedative-hypnotics. Our aim is to carry out price analysis study of commonly used Sedative-hypnotics which are available in the market under various brand names manufactured by different pharmaceutical companies.

METHODS

Prices of various Sedative-hypnotics are obtained from the latest issue of "Current Index of Medical Specialties" (CIMS-Oct 2015- Jan 2016) [6].

1. The minimum and the maximum cost in Rupees (INR) of a particular hypnotic manufactured by various pharmaceutical companies in the same strength are noted.
2. The cost of 10 tablets/ capsules is calculated.
3. The drugs being manufactured by only one company are also included.
4. Those drugs being manufactured by different companies, in different blister packs, are also included, however, the prices have been converted for a pack of 10 for standardization.
5. The cost ratio, the ratio of the cost of the costliest to cheapest brand of the same generic hypnotic is calculated. This tells, how many times the costliest brand costs more than the cheapest one in each generic

group.

6. Percentage cost variation is calculated as follows [7]

$$\% \text{ cost variation} = (\text{maximum cost} - \text{minimum cost}) \div \text{minimum cost} \times 100$$

Table 1: Variation in cost of single drug therapy [6]

Drug	Dose formulations	No of manufacturing companies	Minimum cost (INR)	Maximum cost (INR)	Cost Ratio	% variation in price of 10 tablets/capsules
Benzodiazepines						
Alprazolam	0.25 mg	24	7.01	29.00	4.1	313.7
	0.5 mg	27	12.87	44.50	3.5	245.8
	1.0 mg	15	11.00	50.60	4.6	360.0
	1.5 mg	4	35.00	78.90	2.3	125.4
Chlordiazepoxide	10 mg	3	17.00	35.00	2.0	105.9
	25 mg	3	25.30	52.50	2.1	107.5
Clobazam	5 mg	6	23.00	53.52	2.3	132.7
	10 mg	8	43.00	106.37	2.5	147.4
	20 mg	2	115.48	124.70	1.1	7.9
Clonazepam	0.25 mg	18	10.00	27.00	2.7	170.0
	0.5 mg	30	10.00	36.00	3.6	260.0
	1.0 mg	17	24.00	40.00	1.7	66.7
	2.0 mg	18	39.00	67.00	1.7	71.8
Diazepam	2.0 mg	4	5.00	20.20	4.0	304.0
	5.0 mg	6	7.00	33.21	4.7	374.4
	10.0 mg	6	10.00	40.85	4.1	308.5
Etizolam	0.25 mg	5	19.50	21.45	1.1	10.0
	0.5 mg	7	32.50	38.00	1.2	16.9
	1.0 mg	4	60.00	75.00	1.2	25.0
Flurazepam	15.0 mg	1	38.00	38.00	1.0	0
Lorazepam	1.0 mg	12	7.80	30.00	3.8	284.6
	2.0 mg	12	11.00	34.50	3.1	213.6
	2.5 mg	1	17.00	17.00	1.0	0
Nitrazepam	5.0 mg	4	9.70	22.98	2.4	136.9
	10.0 mg	4	13.20	32.00	2.4	142.4
Oxazepam	15.0 mg	1	8.28	8.28	1.0	0
	3.0 mg	1	12.88	12.88	1.0	0
Z drugs						
Zaleplon	5.0 mg	1	30.00	30.00	1.0	0
	10.0 mg	1	58.00	58.00	1.0	0
Zolpidem	5.0 mg	14	9.90	51.00	5.1	415.1
	10.0 mg	15	26.67	91.00	3.4	241.2
	6.25 mg	1	69.52 (tablet)	81.95(ER tablet)	1.2	17.9
	12.5 mg	1	86.97(tablet)	102.85(ER tablet)	1.2	18.3
Zopiclone	7.5 mg	2	36.75	38.00	1.0	3.4
Eszopiclone [8-10]	1.0 mg	4	42.00	49.00	1.2	16.7
	2.0 mg	5	61.00	64.00	1.0	4.9
Other drugs						
1. Buspirone	5.0 mg	1	8.35	8.35	1	0
	10.0 mg	1	12.35	12.35	1	0
2. Ramelteon [11,12]	8.0 mg	2	109.00	109.00	1	0

RESULTS

This study shows that there is a noticeable variation in the prices of different brands of same Sedative-hypnotics in Indian market. The highest cost variation (415.1%) is found for Zolpidem 5.0 mg tablet, followed by Diazepam 5.0 mg tablet (374.4%). Other significant cost variations are: Alprazolam 1.0 mg (360.0%), Alprazolam 0.25 mg (313.7%), Diazepam 10.0 mg (308.5%), Diazepam 2.0 mg (304.0%) and Lorazepam 1.0 mg tablet (284.6%) The lowest percent cost variation found is of Zopiclone 7.5 mg (3.4%) followed by Eszopiclone 2.0 mg (4.9%) and Clobazam 20.0 mg (7.9%). (Table 1)

DISCUSSION

It has been estimated that over two billion people in developing countries have no access to drugs. They lack access because prices are high and their purchasing power is low [13]. In India, patients are paying out of their pockets for their medical bills and are not covered by insurance schemes, unlike developed countries. 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 [14]. In a large survey significant percentage of even high income respondents indicated cost of the drugs as an important factor

[15]. Subsequently it can lead to poor patient compliance, especially in case of drugs like Sedative- hypnotics which need long duration of therapy. Poor patient compliance is a worldwide problem and can result in patients receiving inappropriate doses of medication [16].

Studies lack in India comparing the cost of the same drug sold under different brand names by different pharmaceutical companies. Therefore, this study was conducted to compare the cost of different brands of the same oral Sedative- hypnotics. Sedative- hypnotics are selected as they are very commonly used drugs nowadays and that too for long term basis.

The findings in our study show a percentage variation in cost above 100% for many available oral Sedative- hypnotics in India. These percentage variations in cost cannot be accepted in a developing country like ours. Out of these 16 commonly prescribed oral drugs which are studied, there is a wide percentage variation in cost leading to an unnecessary economic burden on Indian population. Different studies have shown that if a comparative manual of drug prices is available to the physicians, it will reduce the cost of therapy tremendously [17].

CONCLUSION

Thus, this study highlights that there is a wide variation in cost among the oral Sedative- hypnotics manufactured by different pharmaceutical companies. The Government of India should take effective measures in bringing uniformity in the cost incurred by patients. 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.

LIMITATIONS OF THE STUDY-

Only oral preparations are taken into account for our study.

Combinations drugs are also available in Indian market, but they have not been considered in our study.

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