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Cost Analysis of Adrenergic Receptor Blockers of Different Brands Available in India

Pharmacology

KEYWORDS : Adrenergic receptor blockers, Cost analysis, Generic prescribing.

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ABSTRACT

Background: Adrenergic receptors blockers are drugs used for various diseases like hypertension ,angina, arrthmia, migraine,benign prostatic hyperplasia, phaaeochromocytoma etc ,these medications used for a prolonged period and even sometimes lifelong medications required to treat the 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 adrenergic receptor blocker drugs of different brand names and to analyze price variation among various Adrenergic receptor blocker 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 pharma companies and percentage variation in cost for ten tablets was calculated. Results: Cost analysis of adrenergic receptor blocker drugs was done. These drugs were available in the market different formulations, manufactured by different pharmaceutical companies. Percent variation in cost was found to be highest, for the drug Atenolol (815.34%) of which there were 22 brands followed by Metoprolol (580.54%), of which there were only 28 pharmaceutical brands. Lowest percent variation in cost was of pindolol (30.43%), with 2 pharmaceutical preparations. Conclusion: To increase the benefit on patients counterpart, generic drug prescribing or prescribing cheaper medications of same strength should be encouraged among practitioners.

Introduction:

Treatment cost is a major problem to both physician and patient in a developing country like India, which also affects compliance with therapy[1] Indian pharma industry is growing at a tremendous pace, at present globally ranked third by volume and thirteen largest in terms of value.[2] The market is dominated majorly by branded generics which constitute three-fourth of the market.[3]

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.[4] In India, most of the drugs are available in brands and these are also prescribed by clinician mostly in brand name.

Adrenergic receptors are of two types α and β and are further divided into various subtypes are evaluated and their specific agonists and antagonists are developed .

The various adrenergic receptor blockers are used for various diseases are enlisted here.

α adrenergic receptor blockers -

Pheochromocytoma
Hypertension
Benign prostatic hyperplasia
Secondary shock
Peripheral vascular diseases
Erectile dysfunctions

β adrenergic receptor blocker

Hypertension
Congestive heart failure
Hyperthyroidism
Migraine
Myocardial infarction
Angina
Anxiety states
Aneurysm
Arrhythmia

There are various adrenergic receptor blocker available in Indian market and are prescribed to patients for diseases stated above for which ,patients has to take medications for a prolonged period and even sometimes lifelong medications are required .

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 adrenergic receptor blocker drugs of different brand names and to analyze price variation among various drugs available in Indian market.

Methods:

IDR, Drug triple I compendium , 2015 issue 5 was used as the reference source of information to review the prices of drugs . 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 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 follows[3,5]:

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

Observation & Results:
Cost analysis of total 13 adrenergic receptor blocker drugs was done. These drugs were available in the market as 93 different formulations, manufactured by different pharmaceutical companies.

Table 1. shows variation in costs of adrenergic receptor blocker drugs. Percent variation in cost was found to be highest, for the drug atenolol (815.34%) of which there were 22 brands followed by metoprolol (580.54%), of which there were28 pharmaceutical brands. Lowest percent variation in cost was of pindolol (30.43%), with 2 pharmaceutical preparations.

Table1. Variation in cost of adrenergic receptor blocker drugs.

Drug	Dose(mg)	Number of brands	Minimum cost(INR)	Maximum Cost(INR)	%Variation in cost
atenolol	50	22	5.80	53.09	815.34
metoprolol	50	28	18.50	125.90	580.54
labetalol	100	2	29.57	110.00	494.59
sotalol	40	5	11.50	58.00	404.34
bisoprolol	5	3	20.90	55	163.15
carvedilol	12.5	8	30.00	60.00	100
propranolol	40	5	18.50	31.00	67.56
prazocin	5	3	99.00	163	64.64
Alfuzocin	10	3	85.60	140.25	63.84
Oxprenolol	40	2	7.70	12.00	55.84
Terazocin	2	2	102.75	155	50.85
Nebivolol	5	12	52	68	30.76
Pindolol	10	2	23	30	30.43

Discussion:
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.[6] Drugs are mainly sold under brand names.[7] Several studies in the western world found drug prices to be high and that price discrimination occurred across the industry.[5] 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 adrenergic receptor blockers 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 other group of drugs like antihypertensive and antiepileptic drugs.[8,9] Our study is in agreement with their studies.

In our study, we found that highest price variation was for the drug atenolol which goes in flow with the previous study byAshwini v.karve kanchan B.chattar .[9] The next drug to follow such huge price variation was Metoprolol. Pindolol was the drug found to be lowest price variation among all the adrenergic receptor blocking drugs.

It has been observed that doctors have suboptimal awareness of drug cost.[10] 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.[11]A mention of the drug cost is also required in medical literature and drug advertisement.[9]

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.[12] 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.

In a developing country like India, one of the smart ways to reduce the prescription costs is to use the generics. Even though the Medical Council of India have insisted on prescribing the generic drugs as far as possible, doctors are reluctant to write prescriptions containing only generic or unbranded chemical name of drugs. All too often, the physicians and the patients prefer the expansive brand name drugs because they believe that the generic equivalent is inferior. The present study was undertaken after the implementation of drug price control order act (DPCO) 2016. According to the DPCO 2016, medication price are calculated taking simple average of all brands which have more than one percent market share [13]. Out of 652 drugs under price control, we found that only four adrenergic receptor blocker available were included in the DPCO list 2013. These included atenolol, metoprolol Esmolol, labetalol. Previous randomized controlled trials have proven that these agents prevent recurrent myocardial infarction, stroke and decrease the overall cardiovascular mortality. Therefore by including these medications in the revised price list of DPCO 2016, they are more affordable for the patients. We can now hope that these price changes would improve the patient compliance and their adherence to the treatment regimen.

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