



COST ANALYSIS STUDY OF DIFFERENT BRANDS OF ANGIOTENSIN RECEPTOR BLOCKERS AVAILABLE IN INDIA

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ABSTRACT

Background: Hypertension is one of the major modifiable risk factor associated with coronary artery disease, stroke, heart failure, renal and visual impairment etc. Diabetic hypertensives are more prone for above complications. Being a chronic condition life long treatment is mandatory for hypertension. Among the various antihypertensives used, the usage of Angiotensin receptor blockers (ARBs) are increasing now as monotherapy or as combinations. Cost of drugs play a crucial role in determining the patient's compliance in developing countries. Hence cost analysis of these drugs will help us to improve the same and get some idea about the cost differences in various brands of ARBs available in India.

Methods: Cost of ARBs as single drug, of different strengths manufactured by different pharmaceutical companies, were obtained from "CURRENT INDEX OF MEDICAL SPECIALTIES" July-October 2016. The difference between the maximum and minimum price of the same drug manufactured by various pharmaceutical companies and percentage variation in cost for ten tablets was calculated.

Results: This study shows that, the cost percentage variation was above 100% and significant for losartan 25mg (241.67%) and 50mg(149.09%), telmisartan 20mg(322.22%) and 40mg (203.57%). Also other drugs telmisartan 80mg, candesartan 4, 8mg and olmesartan 10, 20, 40 mg show percentage cost variation of 50.56%, 22.71%, 33.27%, 36.64%, 91.13%, 98.67% respectively.

Conclusion: When a drug is taken for a long period of time, even a small variation in its cost can bring about a significant economical implication. Hypertension being a chronic illness, requires life long control and management. So, doctors should always choose a cheap and effective brand while prescribing a drug, to reduce the patient's economical burden. Hence prescribing cost effective drugs with good margin of safety enhances the patient compliance.

KEYWORDS :

INTRODUCTION

Now a days, non communicable diseases are the leading cause of morbidity and mortality than communicable diseases. Hypertension - a non communicable disease, is a major modifiable risk factor for coronary heart disease, stroke, peripheral artery disease, renal impairment etc^[1]. In 2010, it accounted for 9.4 million deaths and 7% of disability adjusted life years^[2]. About 33% urban and 25% rural Indians are hypertensive^[3]. Also 20-60% of people with diabetics are affected with hypertension^[4]. Diabetic hypertensives are more prone for above complications.

Being a chronic condition and associated with serious complications life long treatment is mandatory for hypertension. Among the various group of antihypertensives, the usage of ACEIs and ARBs are increasing now a days, especially in diabetic hypertensives. Beyond lowering BP, they provide additional nephroprotective and cardioprotective effects^[5]. When compared to each other in head-to-head trials, ACE inhibitors and ARBs generally appear to demonstrate no difference in primary outcomes^[5]. ARBs effectively reduce proteinuria than placebo with similar effect size to ACE inhibitors^[6]. With regard to side effect profiles, ARBs are better tolerated than ACE inhibitors^[7]. The usage of ARBs as monotherapy or fixed dose combinations with other drugs are increased.

Pharmacoeconomics play a crucial role in developing countries like India. As per Equity Master reports, the Indian pharmaceuticals market is the third largest in terms of volume and thirteenth largest in terms of value^[8]. There may be wide cost variation among the various brands of ARBs available here. Hence this study is planned to analyse the percentage variation in prices amongst the various monotherapy of ARBs manufactured by different Indian pharmaceutical companies. This helps in rationale prescription and improves patient compliance.

CURRENT INDEX OF MEDICAL SPECIALTIES (CIMS) July to October 2016^[9] was used as information guide as it is a readily available source of drug information and updated regularly.^[10]

1. Price in Indian rupees (INR) of various ARBs manufactured by

different pharmaceutical companies in India, in the same dose, strength and number were obtained.

2. Cost for ten tablets were calculated
3. Maximum and minimum drug cost for the same formulation manufactured by different pharmaceutical companies was noted.
4. Drug formulations of varying strengths and drugs manufactured by only one or two companies were not included in the study
5. Cost ratio = Maximum cost / Minimum cost

This tells, how many times the costliest brand costs more than the cheapest one in each generic group.^[11]

6. Percentage cost variation was calculated as follows^[12]

$$\% \text{ cost variation} = \frac{\text{Maximum cost} - \text{Minimum cost}}{\text{Minimum cost}} \times 100$$

RESULTS:

The cost for 4 commonly used ARBs drugs as monotherapy were analyzed. They are available in the market as 10 different formulations which are manufactured by different pharmaceutical companies. The price variation assumes significance when the cost ratio reaches more than 2 and percentage price variation is more than 100

Monotherapy

The price variation of some of the commonly used ARBs namely losartan, telmisartan, candesartan, olmesartan prescribed as monotherapy is shown in Tables 1.

Figure 1 shows the cost difference among the various doses of ARBs available.

It is very evident from Table and figures, that the cost percentage variation was above 100% and significant for losartan 25mg (241.67%) and 50mg(149.09%), telmisartan 20mg(322.22%) and 40mg (203.57%). Also other drugs telmisartan 80mg, candesartan 4, 8mg and olmesartan 10, 20, 40 mg show percentage cost variation of 50.56%, 22.71%, 33.27%, 36.64%, 91.13%, 98.67% respectively.

DISCUSSION

Nearly two billion people in developing countries lack access to buy needed drugs because of high cost and their low purchasing ability^[13]. People purchase drugs only for the amount they have and not what their cure. Not only for the below poverty line people, even for high income people cost of the drugs matters a lot^[14]. High prescription cost makes many chronically ill adults cut back medications^[15].

It is scientifically proved that, in no way the costly brand of same generic drug superior to its economically cheaper counterpart^[16]. Patients have to pay unnecessarily if costly brands are prescribed and it is a big burden to them on a long term.

Every doctor must have adequate knowledge on cost-benefit aspect of prescription^[12]. Cost of the drugs is one of the important factors contributing to patient compliance^[17]. Not only medicine cost, patient has also come across the transportation costs, loss of income etc during their treatment course, which are however not much under control of the patient^[18]. However, the medicine cost can be controlled by the physician awareness about the cost of medication that he is prescribing^[19].

Several studies in the western world analyzed about the cost variation across their pharmaceutical industries. However, very few studies are available in our scenarios which compare the cost of drugs of different brands. Cost analysis helps in rationale prescription. In the absence of information on comparative drug prices and quality, it is difficult for doctors to prescribe the most economical prescription^[20].

Though various classes of antihypertensives are available, the use of ARBs is on rise now a days. Hence their cost analysis improves the rationale prescribing by doctor and increases patient compliance.

CONCLUSION:

There exists a lot of price variation among the various brands of ARBs available in India pharmaceutical market. This can reduce the patient compliance as treatment of hypertension is prolonged in nature. The regulatory authorities should take necessary steps to control the price variation of such branded drugs. The prescribing physician should also be aware of such differential pricing of medicines. So, doctors should always choose a cheap and effective brand while prescribing a drug, to reduce the patient's economical burden. Hence prescribing cost effective drugs with good margin of safety enhances the patient compliance.

Tab1 :COST RATIO AND PERCENTAGE COST VARIATION OF COMMONLY USED ARBs –MONOTHERAPY

DRUG NAME	DOSE (MG)	MAX COST (INR)	MIN COST (INR)	COST VARIATION	% COST VARIATION
Losartan	25 mg	45.10	13.20	3.42	241.67
	50mg	68.50	27.50	2.49	149.09
Telmisartan	20mg	76	18	4.23	322.22
	40mg	85	28	3.03	203.57
	80mg	134	89	1.50	50.56
Candesartan	4mg	34.95	28.48	1.22	22.71
	8mg	61.80	46.37	1.33	33.27
Olmesartan	10mg	53.29	39.00	1.36	36.64
	20mg	87.92	46.00	1.91	91.13
	40mg	149	75	1.98	98.67

Fig 1. COST DIFFERENCE [MIN AND MAX] COMMONLY USED ARBs AS A MONOTHERAPY

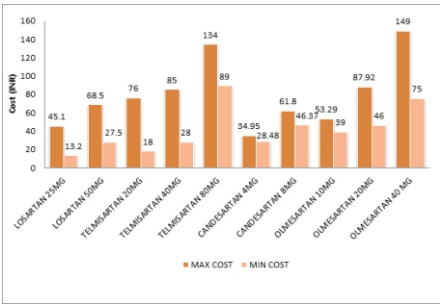


Fig 2.COST RATIO OF COMMONLY USED ARBs–MONOTHERAPY

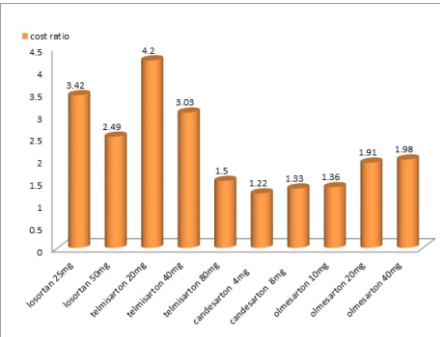
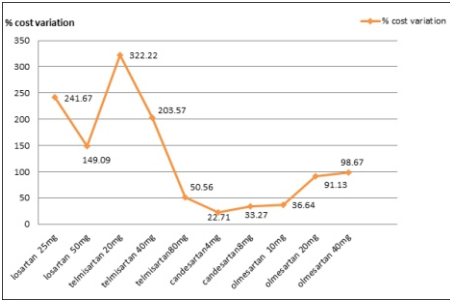


Fig 3.PERCENTAGE COST VARIATION OF COMMONLY USED ARBs –MONOTHERAPY



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