

# Market Analysis of Angiotensin Converting Enzyme (ACE) Inhibitors

*By*

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*Dissertation submitted for the partial fulfillment of the  
MBA Pharmaceutical Management*

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This is to certify that **Mr. Prajakt Gopal Dahake** student of MBA Pharmaceutical Management from The IIHMR University, Jaipur has undergone internship training at **IIHMR University** from Feb. 4, 2016 to May 6, 2016.

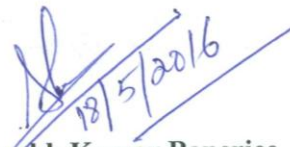
The Candidate has successfully carried out the study designated to him during internship training and his approach to the study has been sincere, scientific & analytical.

The Internship is in fulfilment of the course requirements.

I wish him all success in all his future endeavours.



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**CERTIFICATE BY SCHOLAR**

This is to certify that the dissertation titled **Market analysis of Angiotensin Converting Enzyme (ACE) Inhibitors** and submitted by **Prajakt Gopal Dahake** Enrollment No. 0021 under the supervision of **Dr. Saurabh Kumar Banerjee** for award of MBA in Pharmaceutical Management of the University carried out during the period from 04/02/2016 to 06/05/2016 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.



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I hope that I can build upon the experience and knowledge that I have gained and make a valuable contribution towards the industry in coming future.

## Executive summary

There is a shift observed in the choice of drugs prescribed from beta blockers to ACE inhibitors especially due to their favorable effect on the accompanying concomitant disorders. Older drugs are being replaced by new and more efficacious drugs with less side effects. ACE Inhibitors are one of the highly prescribed drugs in Hypertension and Heart Failure.

The broad objective of the study is to determine the market scenario of ACE Inhibitors in Hyderabad with specific objective of estimating the market value and market volume of ACE Inhibitors, quantifying the market of drug products and brands, determining the market drivers and challenges, and studying the competitor landscape of ACE Inhibitors.

- ✓ The market of Antihypertensive drugs is very competitive and fragmented and therefore there is a need to estimate it.
- ✓ Decision making in companies are becoming more data driven and therefore market analysis reports are very essential.
- ✓ New entrants can evaluate their entry options into such competitive markets for maximum benefits.
- ✓ Market insights can help existing players to assess their competitors.

The study type was descriptive. Both Primary and Secondary research was used for collection of information regarding ACE Inhibitors in the market. The survey was conducted in the City of Hyderabad with Researcher administered questionnaire. The questionnaire consisted of Qualitative as well as quantitative questions.

The target population consisted of Dispensing Pharmacist at the Retail Pharmacies in Hyderabad. Non probability convenience sampling was used as a method for selection of the participant. The sample size was calculated to be 162 at Confidence Interval of 95% and 8% Margin of error. The study was conducted in 162 Retail Pharmacies in Hyderabad city in a duration of 3 months (February 4 to May 6, 2016). The collected data was analyzed using Microsoft Excel 2016 and SPSS 20 software.

The market value of ACE Inhibitors in Hyderabad was estimated to be 185,931,386 at market volume of 37,561,896.

The anti-hypertensive market was found to comprise of 5%  $\beta$ -Blockers, 20% Calcium channel blockers, 24% ARB, 37% Diuretics and 13.5% ACE Inhibitors.

The ACE Inhibitor market was divided into Ramipril (33%), Lisinopril (19%), Enalapril (18%), Imidapril (11%), Captopril (7%), Fosinopril (4%), Perindopril (4%), Benazepril (3%). The Sales force plays a major role in facilitating the expansion of market share.

The rate of prescription has remained the same over the past while the average selling price has decreased. This may be because of high competition among products.

Despite being profitable the market of ACE Inhibitors is highly competitive and has various factors that influence the market attractiveness.

**Keywords:** ACE Inhibitors market, market value, market share, potential, competitor analysis



## Introduction

Hypertension is one of the major chronic diseases resulting in high mortality and morbidity in today's world. Socio-economic, behavioral, and nutritional and public health issues have also led to increase in cardiovascular disease (CVD) throughout the world. A plethora of new drugs are now available, and the quality of life for these patients has altered for the better. A number of drugs in various combinations are generally used for effective long-term management.

Therefore, drug utilisation studies, which evaluate, analyse the medical, social and economic outcomes of the drug therapy, are more meaningful and observe the prescribing attitude of physicians with the aim to provide drugs rationally.

Drug therapy aids in improving the morbidity and mortality of patients with hypertension. Treatment of hypertension should be individualized. Most patients with hypertension will require two or more drugs to achieve BP goal. Hypertension may also be classified by extent of organ damage and etiology.

A prescription is a written advice that mentions drugs and other instructions given to either pharmacist or chemist to dispense the drugs to patients for the proper treatment of disease. It provides information like an adequate dose of the drug to be given, its duration and the way it has to be taken.

Hypertension is a chronic condition and requires treatment for long time/lifelong. It has been seen that hypertensive patients also have other co-morbid conditions/complications like Diabetes Mellitus, CAD, Dyslipidaemia, Neuropathy, Nephropathy.

Higher prevalence of hypertension (HTN) among diabetics in India had reported since 1985. For the treatment of hypertension, various classes of antihypertensive agents such as angiotensin converting enzyme inhibitors (ACE inhibitors), angiotensin receptor blockers (ARBs), calcium channel blockers (CCB), beta blockers, diuretics, and their combinations are available in India. The selection of one drug over the other may depend on various factors including patient profile, age, associated comorbid conditions, cost of therapy, side effects etc.

## Background and Rationale

Hypertension is one of the strongest modifiable risk factors for cardiovascular and kidney disease. Prospective studies collaboration has reported that reducing BP can substantially decrease cardiovascular risk. Treatment of hypertension is constantly evolving in response to new evidence published every now and then and excess of new drugs are being added at a rapid pace. There is a shift observed in the choice of drugs prescribed from beta blockers to ACE inhibitors especially due to their favorable effect on the accompanying concomitant disorders. Older drugs are being replaced by new and more efficacious drugs with less side

effects. Therefore, this study focusses on the estimation and growth of ACE Inhibitors in the market along with the analysis of new market entrants in the same category.

- ✓ The market of Antihypertensive drugs is very competitive and fragmented and therefore there is a need to estimate it.
- ✓ Decision making in companies are becoming more data driven and therefore market analysis reports are very essential.
- ✓ New entrants can evaluate their entry options into such competitive markets for maximum benefits.
- ✓ Market insights can help existing players to assess their competitors.

Antihypertensives remained the largest drug class in 2010, with global sales of \$37.6bn and a global market share of 22%. Novartis's Diovan led the antihypertensives segment with \$3.6bn in sales, followed by Benicar with sales of \$2.9bn. Pfizer's Norvasc, one of the blockbusters in this sub-category suffered strong sales erosion and lost significant market share to Diovan.

Angiotensin receptor blockers (ARBs) remained the most prescribed therapeutic class within antihypertensives, driven by key brands such as Diovan, Cozaar, and Avapro.

Angiotensin converting enzyme (ACE) inhibitors have also been on the decline due to competition from ARBs and increased genericization.

An increased blood pressure leads the heart to work harder, which makes the heart and arteries more susceptible to injury. Hypertension further increases the risk of incidents such as heart attack, heart failure, and atherosclerosis.

There are several factors that lead to hypertension, such as a sedentary lifestyle, alcohol consumption, high sodium diet, high fat diet, high alcohol intake, obesity, and age. Furthermore, people with indications such as diabetes mellitus or kidney disease, and even those with social or occupational stress, are in the high-risk group.

The most commonly prescribed drug classes were Diuretics followed by ARB's, CCB's, BB's and ACE-Inhibitors. ACE-Inhibitors if patient had HTN with DM. Elderly patients were generally started with CCB's and later Diuretics were added to reduce cardiovascular clinical events and stroke. Hypertension treatment using Diuretics or BBs was more cost-efficient than with ARBs or CCBs.

These classes include thiazide diuretics, angiotensin-converting enzyme inhibitors (ACEIs), angiotensin receptor blockers (ARBs), beta-blockers and calcium channel blockers. Cost Analysis can be done by Pharmacoeconomic Evaluating method. Pharmacoeconomics is the field of study that evaluates the behavior of individuals, firms and markets relevant to the use of pharmaceutical products, services and programs, and which frequently focuses on the costs and consequences of that use.



The choice of antihypertensive drug should be determined by the drug's capacity to lower pressure, to protect the diabetic patient's kidney from ongoing injury and cardiovascular complications. Antihypertensive and lipidlowering treatment to prevent heart attack trial compared metabolic, cardiovascular, and renal outcomes in individuals assigned to initial hypertension treatment with a thiazide-like diuretic (chlorthalidone), a calcium channel blocker CCB; amlodipine), or an ACE inhibitor (lisinopril) in nondiabetic individuals with or without metabolic syndrome. It showed despite a less favorable metabolic profile, thiazide-like diuretic initial therapy for hypertension offers similar, and in some instances possibly superior, CVD outcomes in older hypertensive adults with metabolic syndrome, as compared with treatment with CCBs and ACE inhibitors strategies based on renin-angiotensin system inhibitors were not clearly superior to conventional (i.e., diuretic-based) strategies. Furthermore, ACEIs showed to reduced incidence of coronary heart disease compared to diuretics and reducing cardiovascular event compare to CCB , but heart failure and stroke were lower in diuretics.

Use of multiple drugs in combinations is being increasingly recognized as critical to control hypertension in patients with diabetes. Several large clinical trials demonstrated that most patients with hypertension could achieve and sustain adequate blood pressure control only with the use of multiple antihypertensive drugs . A large proportion of treated patients (59%) were being prescribed multidrug regimens. In addition, it was intensified with increasing age, duration of diabetes, duration of hypertension or if complications or comorbidities were present, this was in consistency with treatment pattern of the evidencebased guidelines.

## Literature Review

According to (Kaur, 2012), 25% of the world's adult population has hypertension and this is likely to increase further by 2015. Modelled projections indicate an increase to 1.15 billion hypertensive patients by 2025 in developing countries including India. The prevalence of hypertension in India is highest in age group of 50-59 years in males and 60-64 in females in urban areas whereas in rural areas an age related increase is seen in both sexes in age group 60-64.

Since two decades, there has been an exponential increase in the use of new antihypertensive like ACE inhibitors and ARBs. There is a shift in the choice of drugs for hypertension from beta blockers and diuretics to ACE inhibitors and ARBs. A study has shown that 33.8% prescriptions had ACE inhibitors as most frequently prescribed drug as monotherapy followed by CCBs (30.7%), beta blockers (13.8%) and diuretics (6.9%). ACE inhibitors also have an edge over the other drugs in view of its favorable effect on the accompanying co-morbid conditions.

Studies have shown that good BP control is achieved only in minority of patients on antihypertensive mono therapy. Majority of patients will require a combination of two or more drugs for sustained and effective control of BP.

Adverse effects are rightly regarded as a significant obstacle to the successful treatment of hypertension and as most of these are dose related, the problem could be minimized by the use of low dose combinations. Low dose combinations can doubly benefit the patients by being more efficacious and more sage thereby has the potential to improve the quality of life of the patient.

The most commonly prescribed drugs of ACE inhibitors is Enalapril & Ramipril accounting for about 50% of the category. (sandozi, december 2014)

According to (evaluategroup.com, 2015), ACE inhibitor annual sales in India in 2013 was about 1582m and market share was 54% in the therapy area.

In a study conducted by (Arief, 2013), it was observed that the physicians had preferred monotherapy more often than the combinations and the most frequently prescribed agent among monotherapy was ACE-Inhibitor class. ACE-Inhibitors are the only class of drugs that are often prescribed to diabetic hypertensive patients, as these drugs prevent the chance of occurrence of diabetic nephropathy, retinopathy and other related complications.

According to (Gomathi, 2015) For the treatment of hypertension, various classes of antihypertensive agents such as angiotensin converting enzyme inhibitors (ACE inhibitors), angiotensin receptor blockers (ARBs), calcium channel blockers (CCB), beta blockers, diuretics, and their combinations are available in India. The selection of one drug over the other may depend on various factors including patient profile, age, associated comorbid conditions, cost of therapy, side effects etc. For the treatment of hypertension, various classes of antihypertensive agents such as angiotensin converting enzyme inhibitors (ACE inhibitors), angiotensin receptor blockers (ARBs), calcium channel blockers (CCB), beta blockers, diuretics, and their combinations are available in India. The selection of one drug over the other may depend on various factors including patient profile, age, associated comorbid conditions, cost of therapy, side effects etc.

**Research Problem:**

Indian Anti-hypertensive market is expanding with a CAGR of 12.6% but the market share is diluting with increasing number of brands. ACE Inhibitors are one of the Highly prescribed drugs used in the treatment of Hypertension. This calls for the need to assess its highly fragmented market and competitive landscape to facilitate effective decision making for new entrants and competitive advantage.

**Research Question:**

- What is the market potential of ACE inhibitors in Hyderabad city?
- What are the market drivers and challenges of ACE Inhibitors?

**Aim:**

- To determine the market potential of ACE Inhibitors in Hyderabad.

**Objective:**

- To estimate the market value and market volume of Ace inhibitors
- To quantify the market of drug products and brands of ACE Inhibitors.
- To determine the market drivers and challenges for ACE Inhibitors.
- To study the competitor landscape of ACE Inhibitors.

## Methodology

### Research Design

- **Study type:** Descriptive study
- **Data source:** Primary and secondary research
- **Data collection technique:** Survey
- **Data collection tool:** Researcher administered Semistructured questionnaire.

### Sample Design:

- **Target population:** Dispensing Pharmacist
- **Sampling method:** Non-probability convenience sampling
- **Sample size:** 162 Dispensing Pharmacist (at 95% Confidence Interval and 8% Margin of error)
- **Study Location:** Hyderabad

The target population consisted of Dispensing Pharmacist at the Retail Pharmacies in Hyderabad. Non probability convenience sampling was used as a method for selection of the participant. The sample size was calculated to be 162 at Confidence Interval of 95% and 8% Margin of error. The study was conducted in 162 Retail Pharmacies in Hyderabad city.

- **Analysis Software:** MS Excel 2016 and SPSS 20.
- **Study duration:** February 4 to May 6, 2016.

### **Ethical Consideration**

The research was completed with appropriate research guidelines. Enough time was given to the respondent of the study so that they can depict their true view on research questions.

Consent from the respondents was taken and appropriate permission was also ensured for the usage of their given data.

The disclosure of respondent identity was based on their permission where if they are not willing to disclose identity, their identity was exhibited.

Usage of secondary data from sources were acknowledged with appropriate references.

## **Results and Analysis:**

### **Market Volume and Market Value of ACE Inhibitors**

Determining the market volume and value required exclusive data which was obtained through secondary research to fill the shortcomings in the model that was used to calculate the market volume and value.

#### **Method I: Epidemiology based model**

The population of Hyderabad city was found. A meta-analysis done by (Anchala, June 2014) revealed that the prevalence rate of hypertension is 33% in Urban cities of India. The diagnosis rate was about 25% and treatment rate was found to be 38%. The market share of ACE Inhibitor was found using Primary research and inserted into the model. The average dosage frequency of ACE Inhibitors was found to be 2 units in the form of either tablet or capsule. This information was used in the calculation of the Total Market Volume of ACE Inhibitors. The Average selling price (ASP) of each unit was found to be Rs.4.95 using which the Total Market value was calculated.

|                                 |     |                    |
|---------------------------------|-----|--------------------|
| Population                      |     | 11,723,548         |
| Prevalance Rate (%)             | 33% | 3,868,771          |
| Diagnosis Rate (%)              | 25% | 967,193            |
| Treatment Rate (%)              | 38% | 367,533            |
| Antihypertensive share of ACE-I | 14% | 51,455             |
| Doses per day                   |     | 2                  |
| <b>Total Market Volume</b>      |     | <b>37,561,896</b>  |
| Average Selling Price (INR)     |     | 4.95               |
| <b>Total Market Value (INR)</b> |     | <b>185,931,386</b> |
| <b>Ramipril</b>                 |     |                    |
| Market Volume                   | 32% | 12,019,806.75      |
| ASP (INR)                       |     | 5.28               |
| Market Value (INR)              |     | 63,464,580         |
| <b>Enalapril</b>                |     |                    |
| Market Volume                   | 28% | 10,517,331         |
| ASP (INR)                       |     | 2.50               |
| Market Value (INR)              |     | 26,293,327         |
| <b>Lisinopril</b>               |     |                    |
| Market Volume                   | 16% | 6,009,903          |
| ASP (INR)                       |     | 4.68               |
| Market Value (INR)              |     | 28,126,348         |
| <b>Fosinopril</b>               |     |                    |
| Market Volume                   | 9%  | 3,380,571          |
| ASP (INR)                       |     | 9.71               |
| Market Value (INR)              |     | 32,825,341         |
| <b>Captopril</b>                |     |                    |
| Market Volume                   | 6%  | 2,253,714          |
| ASP (INR)                       |     | 2.74               |
| Market Value (INR)              |     | 6,175,176          |
| <b>Imidapril</b>                |     |                    |
| Market Volume                   | 5%  | 1,878,095          |
| ASP (INR)                       |     | 4.46               |
| Market Value (INR)              |     | 8,376,303          |
| <b>Perindopril</b>              |     |                    |
| Market Volume                   | 2%  | 751,238            |
| ASP (INR)                       |     | 7.66               |
| Market Value (INR)              |     | 5,754,482          |
| <b>Benazepril</b>               |     |                    |
| Market Volume                   | 2%  | 751,238            |
| ASP (INR)                       |     | 6.09               |
| Market Value (INR)              |     | 4,575,039          |
| <b>Market Value (INR)</b>       |     | <b>175,590,596</b> |

The percentage market share of each Molecule of ACE Inhibitor was obtained through primary research and their respective Market volume and value was calculated.



## Method II: Retailer Based Model

The article (the Hindu, 2015) suggests that there are about 6,000-7,000 Retail pharmacy stores in Hyderabad and therefore an average number of Pharmacies was calculated as 6,500.

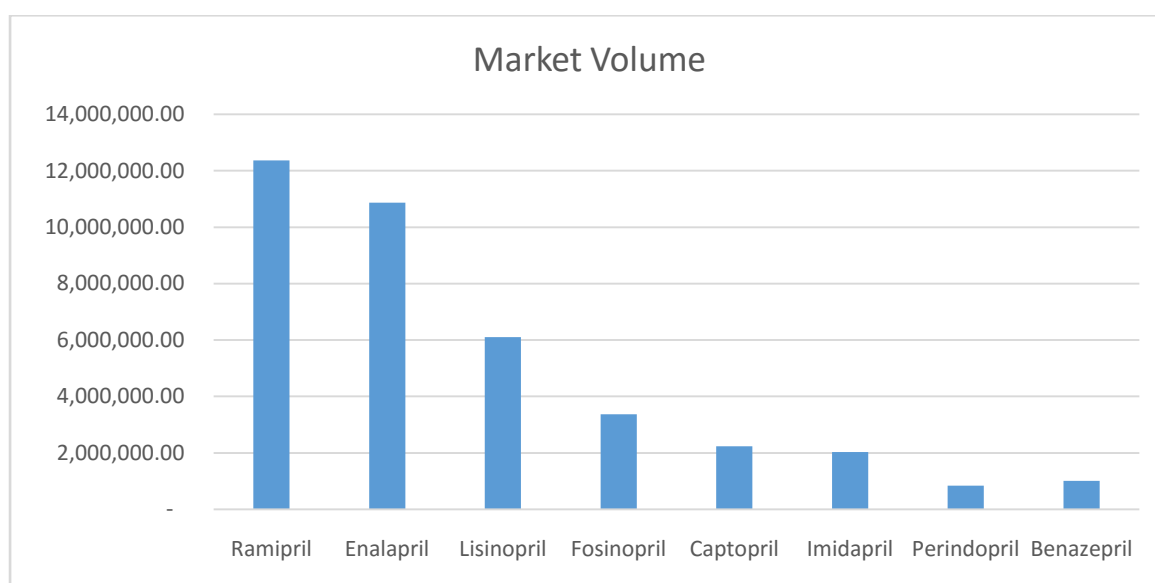
The primary research provided the values for weekly sales, Average selling prices and average number of units per strip.

The combined research data was used to calculate the Market volume and Market value of the individual molecules existing in the market.

|             | No. of Pharmacies | Strips/week | ASP (INR) | Avg. Units/strip | Market Volume | Market Value (INR) |
|-------------|-------------------|-------------|-----------|------------------|---------------|--------------------|
| Ramipril    | 6,500             | 3.66        | 5.28      | 9.98             | 12,361,466    | 65,268,539         |
| Enalapril   | 6,500             | 0.75        | 2.50      | 42.92            | 10,863,106    | 27,157,765         |
| Lisinopril  | 6,500             | 1.75        | 4.68      | 10.31            | 6,100,900     | 28,552,212         |
| Fosinopril  | 6,500             | 1.00        | 9.71      | 10.00            | 3,371,309     | 32,735,409         |
| Captopril   | 6,500             | 0.66        | 2.74      | 10.00            | 2,230,800     | 6,112,392          |
| Imidapril   | 6,500             | 0.60        | 4.46      | 10.00            | 2,028,000     | 9,044,880          |
| Perindopril | 6,500             | 0.25        | 7.66      | 10.00            | 845,000       | 6,472,700          |
| Benazepril  | 6,500             | 0.10        | 6.09      | 30.00            | 1,014,000     | 6,175,260          |
| Total       |                   |             |           |                  | 38,814,581    | 181,519,157        |

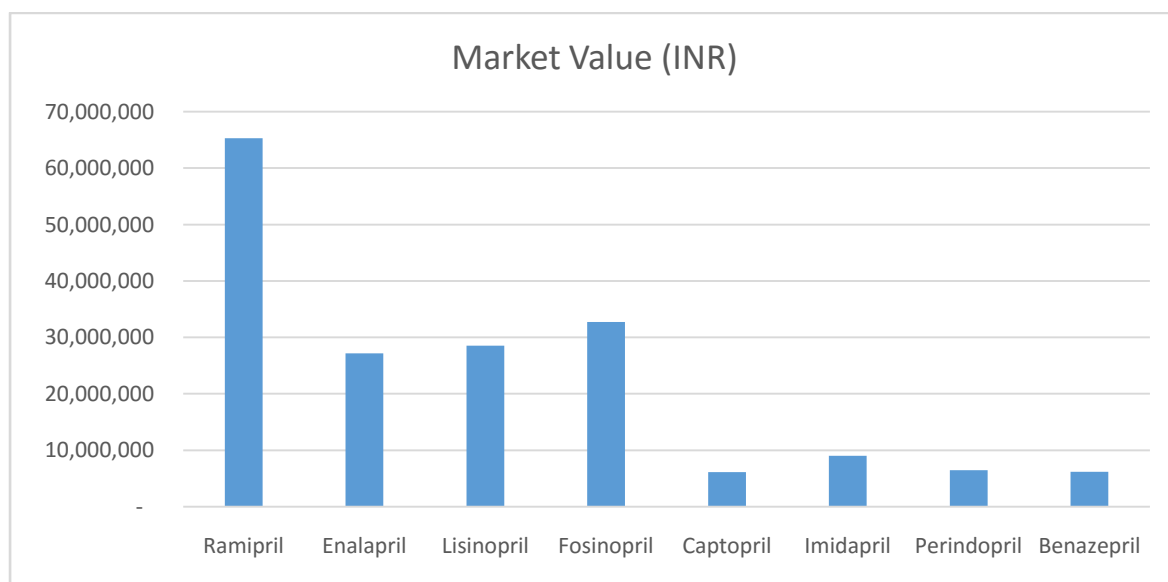
The Market volume and Market value calculated using both methods appeared to variate only by 3.34% in terms of volume and 2.4% in value.

## Comparison of Market Volume of different Molecules



The primary research revealed the most prescribe molecule of ACE Inhibitor was Ramipril followed by Enalapril, Lisinopril, Fosinopril and Captopril.

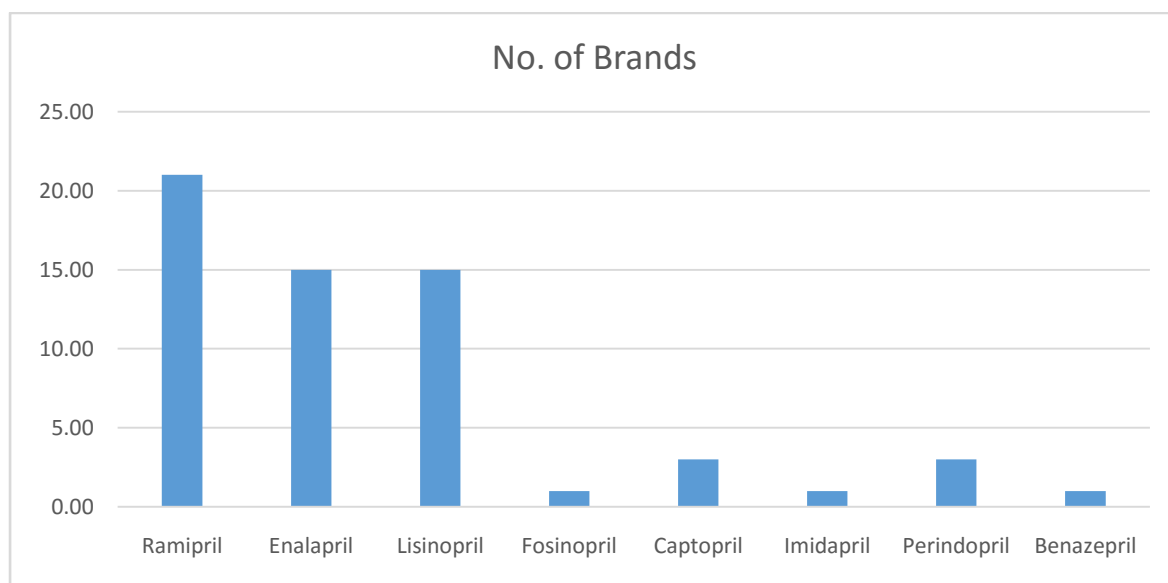
## Comparison of Market Value of different Molecules



Even though the market volume indicates the highly prescribed molecules, however the market value shows a different picture due to variation in the Selling prices of these molecules. This variation in the Prices may be because different molecules shows different efficacy at different dosage and therefore its quantity in the formulation effects the price of the final product.

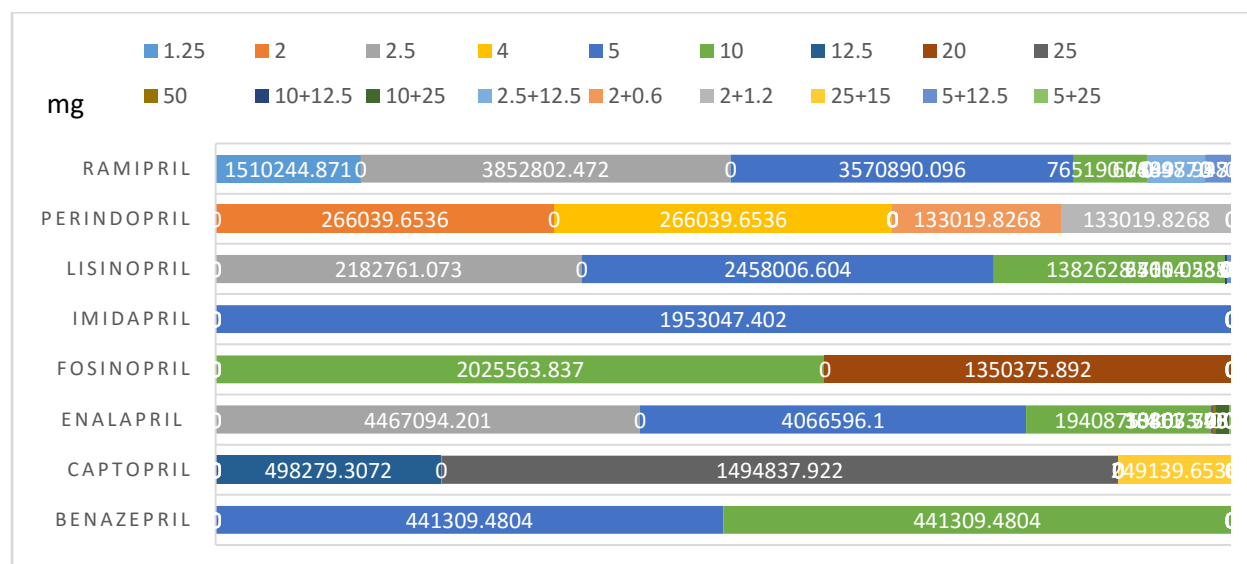
Ramipril appeared to occupy major value share followed by Fosinopril, Lisinopril and Enalapril.

## Comparison of number of brands of different Molecules



The number of brands present in the market was found to be in direct proportion to the Market Volume occupied by the Molecules.

## Distribution of Different dosage Strengths of ACEI Molecules



The above graph shows the prescription share occupied by different dose strengths within individual molecule.

The highly prescribed strengths for individual molecules is 2.5mg Ramipril, 2mg Perindopril, 5mg Lisinopril, 5mg Imidapril, 10mg Fosinopril, 2.5mg Enalapril, 25mg Captopril and 10mg Benazepril.

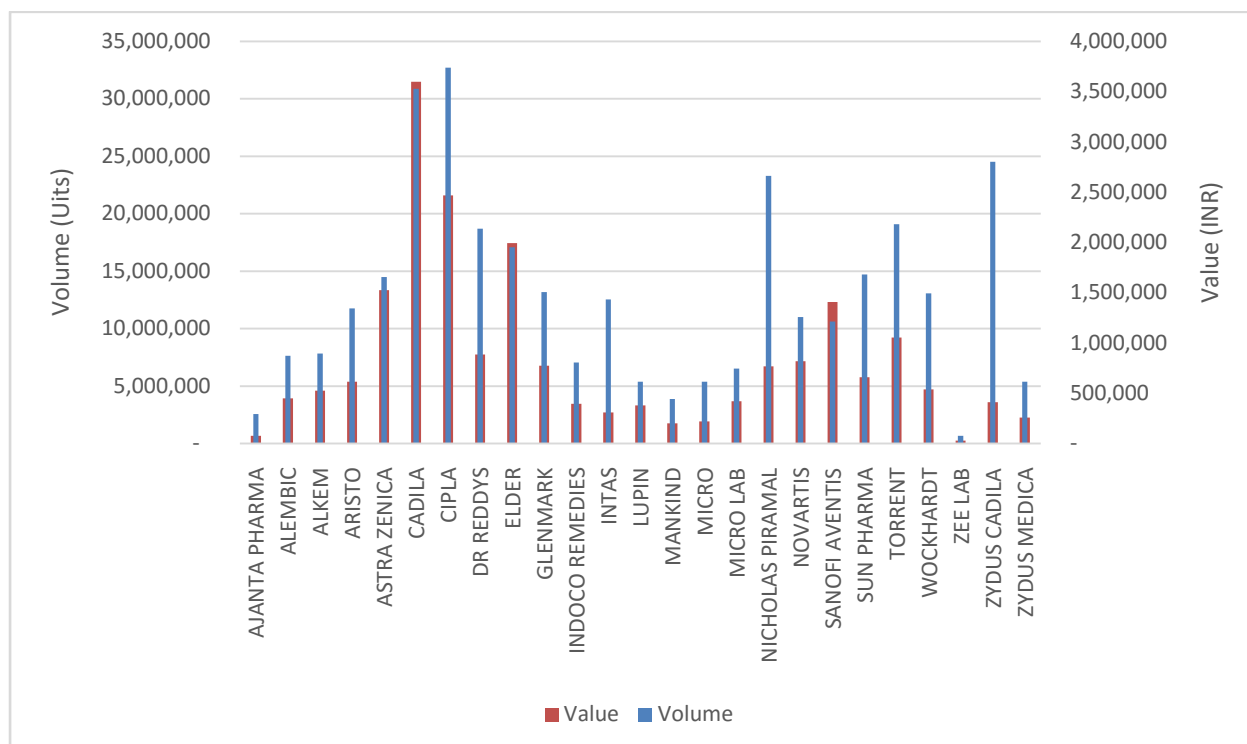
## ACE Inhibitors Market overview with Top Selling Brands



It was observed that the top 5 brands of Ramipril and Lisinopril occupy about 43% and 73% share of the respective Market.

The competition among brands for other molecules was quite defined with limited brands occupying a significant market share.

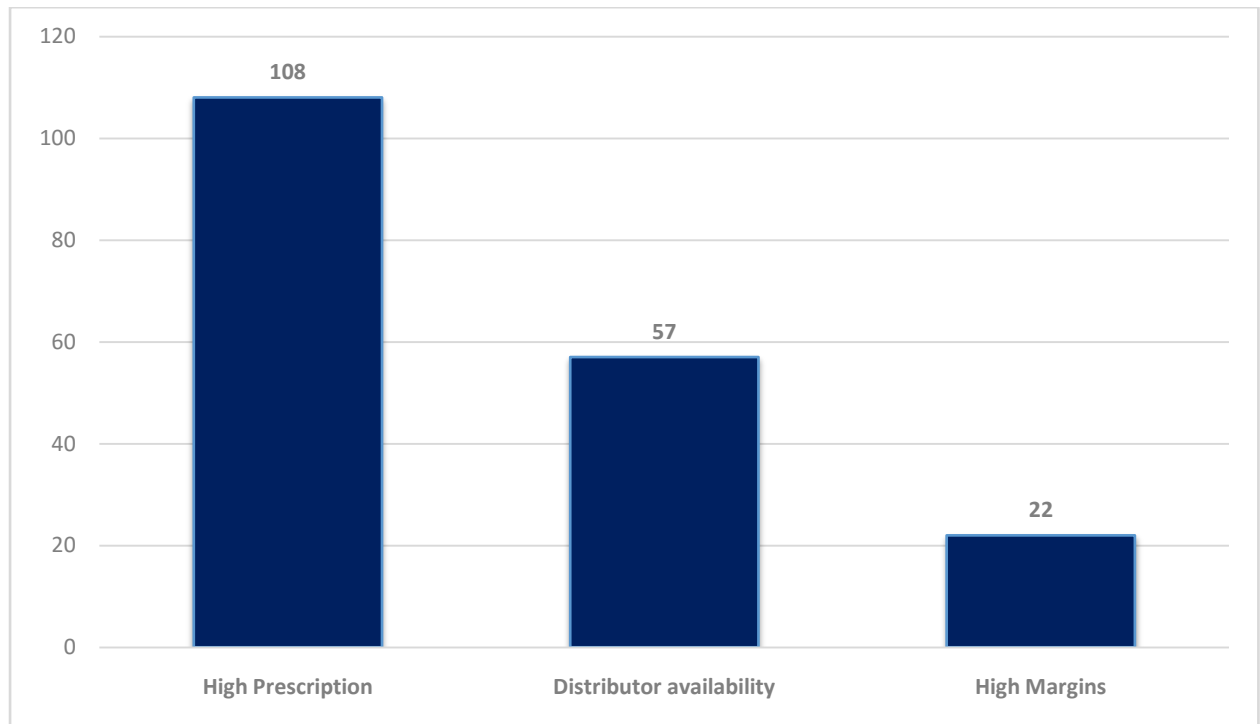
## Comparison of Company Market share by volume and value



Cipla is seen to be leading the ACE Inhibitor market in terms of Volume while Cadila leads in terms of Market Value.

Some of the major players in the market are Cipla, Cadila, Zydus Cadila, Nicholas Piramal and Elder Pharma.

## Reasons for availability of Brands present in the Market



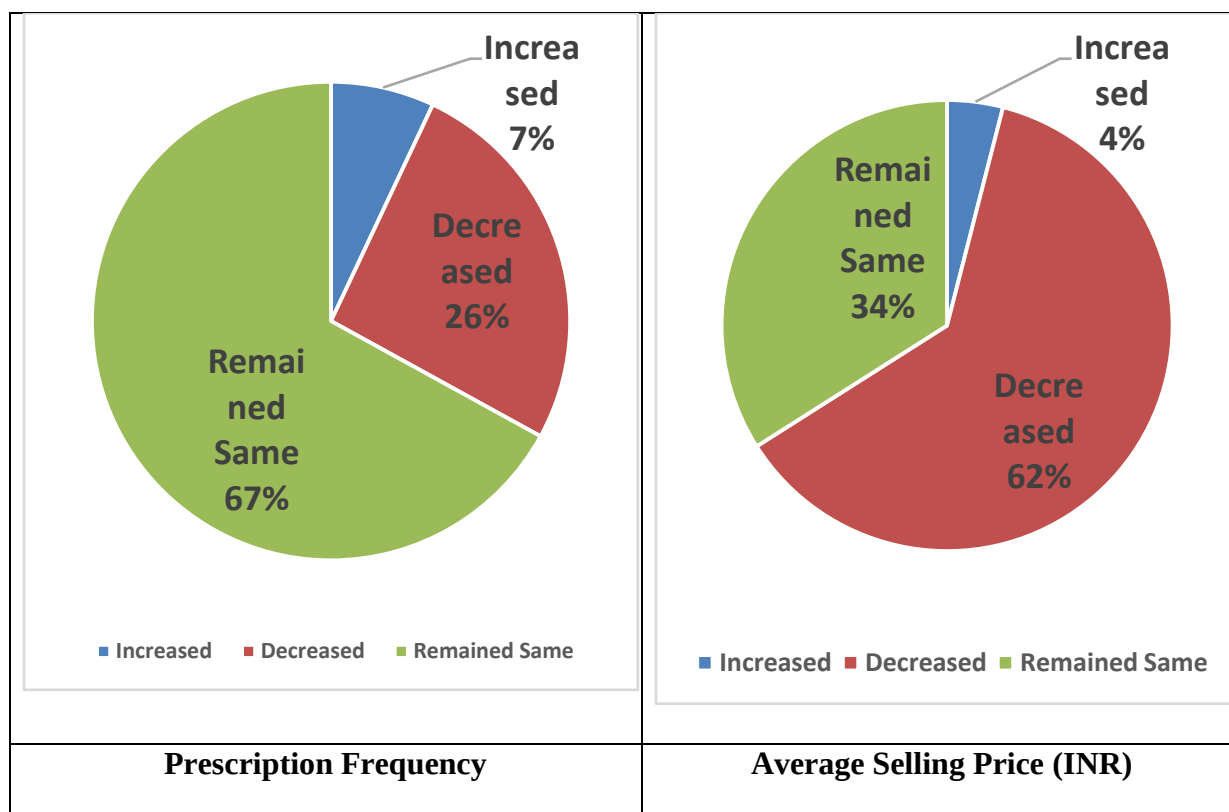
Around 108 of the primary participants said that High prescription was the reason for them to keep availability of the brands that were occupying the market.

57 of the primary participants said that the availability of the distributors was the reason to make these brands available at their stores.

While only 22 participants said that they kept these brands at their stores due to high margins they provided.



## Trends observed in the prescription frequency and Selling Prices



About 67% of Primary participants said that they did not observe any changes in the prescription frequency of ACE Inhibitors at their stores.

About 62% of the participants said that they have observed decline in the Selling prices.

## Anti-Hypertensive market Landscape

|                            | <b>β-Blockers</b> | <b>Calcium Channel Blocker</b> | <b>Angiotensin Receptor Blockers</b> | <b>Diuretics</b> | <b>Angiotensin Converting Enzyme Inhibitor</b> |
|----------------------------|-------------------|--------------------------------|--------------------------------------|------------------|------------------------------------------------|
| Avg. weekly sales (strips) | 3<br>(5.1%)       | 12<br>(20%)                    | 14<br>(24%)                          | 22<br>(37%)      | 8<br>(13.5%)                                   |
| Highly prescribed brands   | Ciplar            | Acord                          | Cortel                               | Hydrazide        | Tanatril                                       |
|                            | Bisocar           | Dicard                         | Arbitel                              | Frusenex         | Hopecard                                       |
|                            | Betaloc           | Renidil                        | Cresar                               | Acecid           | Enam                                           |

The above table shows the Anti-hypertensive agents that directly compete with ACE Inhibitors in the market.

The most highly prescribed agents are Diuretics followed by Angiotensin Receptor Blockers (ARB), Calcium Channel blockers, ACE Inhibitors and Beta-blockers.

- Brand substitution in Pharmacies = 24%

Nearly 24% of Participants said that they have substituted brands in the prescription. This was mainly because of unavailability of prescribed brand at the time of dispensing.

- Which signifies that the market share is not only influenced by prescribers but also other factors at the Pharmacy.
- Prescription of ACEI with Hypoglycemic agents = 2 prescriptions/week
- This indicates that 25% of ACEI are prescribed in Diabetic patients. Therefore, combination products can become a feasible option for manufacturers.
- Prescription of other Anti-Hypertensive with Hypoglycemic agents = 11 prescription/week=21.56% of Anti-hypertensive Market

## Market drivers

- Increasing Hypertensive population due to Life style changes.
- Increasing concomitant diseases with hypertension, like Diabetes and kidney disorders
- Aging population
- First choice of treatment for low Hypertension.

## Challenges

- Expiring Patents of ARBs
- Increasing Market of ARB due to less side effects compared to ACEI

## Strategies used by companies

Increased sales force and detailing activity.

Combination with other ACEI or other Anti-Hypertensive drugs.

Formulation modification (bid or tid to qd)

Making product available in new markets

### **Market penetration strategy:**

Market share growth- Red ocean strategy

Customer loyalty improvement-migrate existing customer, add value to existing brand

Customer value improvement- increase customer profitability by decreasing cost to serve increase prescription frequency

## Discussion

The market value of ACE Inhibitors in Hyderabad was estimated to be 185,931,386 at market volume of 37,561,896.

The anti-hypertensive market was found to comprise of 5%  $\beta$ -Blockers, 20% Calcium channel blockers, 24% ARB, 37% Diuretics and 13.5% ACE Inhibitors.

The ACE Inhibitor market was divided into Ramipril (33%), Lisinopril (19%), Enalapril (18%), Imidapril (11%), Captopril (7%), Fosinopril (4%), Perindopril (4%), Benazepril (3%).

Cipla was found to be leading the ACEI Market in Volume while Cadila lead in Value.

High prescription was a leading factor in availability of specific Brands in the market.

According to the primary participants, the rate of prescription has remained the same over the past while the average selling price has decreased. This may be because of high competition among products.

Brand substitution was seen due to factors such availability at time of dispensing and sales force influence.

ACE Inhibitors were prescribed mostly in cases of concomitant disorders and therefor combination could be a feasible option for Companies

## Conclusion

The ACE Inhibitors occupy about 14% of Anti-hypertensive market in Hyderabad but their market has been drastically influenced by steadily increasing market of ARBs.

Ramipril is highly prescribed but its market is also highly fragmented due to large number of competitors.

For New entrants, the market appears to be highly challenging due to established customer loyalty by Older brands.

The Market penetration strategies could be applied in order to maximize Market share.

Sales force plays a major role in the prescription generation in such competitive markets.

Combination drugs were found to occupy only a minor portion of the market. This count may increase over the period due to changes in therapy and formulation developments.

## Suggestions

The report gives an insight of how the market is moving and this would facilitate the companies in deciding the right product which would be more profitable.

The company can choose to come up with a highly prescribed molecule with highly prescribed strength and compete in the market using red ocean strategy.

The company can also choose to enter into a monopolistic market and try to grab the market share of the existing player.

Combination therapy is used in most of the patients therefore combination drugs can also be a feasible market.

## Limitations

The sample size was less.

Study was conducted only in one city.

Study depicts only the current data and not the forecast.

Some of the questionnaires were partially answered.

Time duration for interview was also shortened due to the working hours of the participants therefore, more questions could not be asked.

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## Annexes

### Questionnaire

1. What molecules of ACE Inhibitors are available at your pharmacy?

- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_
- d) \_\_\_\_\_

2. Please give the following information on ACE Inhibitors available at your Pharmacy

| Brand | Strengths<br>(mg) | Dosage Form<br>(Tab., Cap.,<br>Inj.) | Dose<br>(qd, bid, tid) | Manufacturer |
|-------|-------------------|--------------------------------------|------------------------|--------------|
|       |                   |                                      |                        |              |

| Brand | No. of Tablets/strip | Price/strip | Weekly sales<br>(strips) |
|-------|----------------------|-------------|--------------------------|
|       |                      |             |                          |

3. What is the reason for keeping only these brands of ACE Inhibitors?

- ☐ Higher Prescription
- ☐ Availability of distributor
- ☐ High Margins

4. In comparison to the past, the prescription of ACE Inhibitors has

- ☐ Increased
- ☐ Decreased



☐ Remained same

5. In comparison to the past, the average price of ACE Inhibitors has

☐ Increased

☐ Decreased

☐ Remained same

6. What is the weekly sales of other Antihypertensive drugs?

| $\beta$ -blockers | Calcium<br>channel<br>Blockers | Vasodilators | ARB | Diuretics |
|-------------------|--------------------------------|--------------|-----|-----------|
|                   |                                |              |     |           |

7. Do you substitute among Brands of ACE Inhibitor in the prescription and what is the reason?

☐ Yes

☐ No

8. What is the frequency of prescription of ACE Inhibitors with type 2 diabetes drugs?

\_\_\_\_\_

9. What are the other antihypertensive prescribed with type 2 diabetes drugs?

\_\_\_\_\_

10. What are the most prescribed brands of Calcium Channel Blockers?

\_\_\_\_\_

11. What are the most prescribed brands of Angiotensin Receptor Blockers?

\_\_\_\_\_