

**Summer Training at
Abbott Healthcare Pvt. Ltd
(May 01- June 10, 2012)**

**To Study the Prescription Trend, Sales and Availability of Cefpodoxime
and Clavulanic Acid in Jaipur Market**

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**Post Graduate Diploma in Pharmaceutical Management
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**Institute of Health Management Research,
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Certificate

This is to certify that Mr. Ankit Verma from Institute of Health Management Research, Jaipur has undergone Summer Training at Abbott Healthcare Pvt Ltd, Jaipur from 01st May, 2012 to 10th June, 2012.

The candidate himself carried out the project. His approach to the study has been sincere, scientific and analytical. This summer training is partial fulfillment of the course requirement is recommended for the award of post graduate diploma in pharmaceutical management.

I wish him success in all his future endeavors.



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ANKIT VERMA

PGDPM – 03

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Chapter-1

PHARMACEUTICAL INDUSTRY OVERVIEW

“Indian pharmaceutical industry can be defined as a success story providing employment to millions and ensuring that essential drugs are available at affordable prices to the vast population of Indian sub-continent”

-RICHARD GESTER
(Economist)

The Indian Pharmaceutical Industry today is in the front rank of India's science-based industries with wide ranging capabilities in the complex field of drug manufacture and technology. Accounting for two percent of the world's pharmaceutical market, the Indian pharmaceutical sector has an estimated market value of about US \$8 billion. It's at 4th rank in terms of total pharmaceutical production, and 13th in terms of value.

It is growing at an average rate of 7.2 % and is expected to grow to US \$12 billion by 2011. Over the last two years the pharmaceutical market value has increased to about US \$ 355 million because of the launch of new products. According to an estimate, 3900 new generic products have been launched in the past two years. These have been by and large launched by big brands in the pharmaceutical sector. And in the year 2005 Indian pharmaceutical companies captured around 70% of the domestic market.

Earlier these big firms had apprehensions in launching new drugs in the Indian market. As in the present scenario, only a few people can afford costly drugs, which have increased price sensitivity in the pharmaceutical market. Now the companies are trying to capture the market by introducing high quality and low price medicines and drugs. With the Product Patent Act, which came into action in January 2005, this industry is able to attract big MNCs to India

At present, a large number of Indian pharmaceuticals companies are looking for tie-ups with foreign firms for in-license drugs. GlaxoSmithKline is among the top choices for the firms that wish to launch their product in India, but do not have any branch over here. Contract research and pharmaceutical outsourcing are the new avenues in the pharmaceutical market. Contract manufacturing is growing at a very fast pace and is estimated to grow to US \$30billion, whereas contract research is estimated to reach US\$6-10 billion.

Indian multinational companies like Dr. Reddy's Lab, Cipla, Ranbaxy, Sun Pharma etc have created awareness about the Indian market prospects in the international pharmaceutical market. Approvals given by Foods and Drugs Administration (FDA) and ANDA (Abbreviated New Drug Application)/DMF (Drug Master File) have played an important role in making India a cost-effective and high quality product manufacturer. Furthermore, the changes that took place in the patent law, change of process patent to product patent, have helped in reducing the risk of loss for intellectual property.

Rank	Company	Revenue (Rs. Crore)
1	Ranbaxy Laboratories	4198.96
2	Dr. Reddy's Laboratories	4162.65
3	Cipla	3763.72
4	Sun Pharmaceuticals	2463.59
5	Lupin Ltd	2215.52
6	Aurbindo Pharma	2081.19
7	Glaxosmithkline	1773.41
8	Cadila Healthcare	1613
9	Aventis	983.80
10	Ipca Laboratories	980.44

Table 1.1: Top 10 pharmaceuticals in India

Chapter-2

Introduction of Organization

Abbott, is a company that focuses on turning science into caring – ABBOTT, A Promise for Life. For more than a century, Abbott Laboratories has been working to advance health care for people around the world. Founded in 1888 by a young Chicago physician, Dr Wallace Calvin Abbott, Abbott Laboratories has evolved into a diversified health care company that discovers, develops, manufactures and markets innovative products and services. Products and services of Abbott span the continuum of care from prevention and diagnosis, to treatment and cure. Abbott today is a global, diversified health care company devoted to the discovery, development, manufacture and marketing of pharmaceutical, diagnostic, nutritional and hospital products. The company now employs approximately 65,000 people and markets its products in 130 countries worldwide.

Abbott extends this commitment with a strong presence in India as it has grown and evolved its operations in India over many decades. Our products encircle life from newborns to ageing adults. Abbott has built expertise and leadership in primary care therapeutic areas like Gastroenterology and Pain care. Our specialty areas include Neuroscience, Metabolic and Hospital Care.

Abbott serves the needs of Indian consumers with products backed by science and R&D. They have locally developed brands like Digene, Cremaffin, Epilex, Zolfresh and Obimet. Abbott has also brought global products including Brufen, Prothiaden, Ganaton, Sevorane, Thyronorm and Leptos to Indian consumers. Abbott's pioneering products like Survanta help infants.

Abbott India, today has strong brand equity and commands esteem in the market place. To reach the customer, Abbott India has a network of 18 distribution points, which cater to 11,000 stockists and 70,000 retailers. Behind Abbott India's success, is a team of competent, committed people, driven by the principles of Value Based Management, and aided by strong alliances and partnerships

Abbott India Limited provides healthcare solutions through its four business units:

1. Primary Care, which markets products in the areas of Pain Management, Gastroenterology, with well-known brands like Brufen, Digene, Cremaffin.

2. Specialty Care – Metabolic & Urology provides solutions in the areas of Thyroid, Obesity, Diabetes and Benign Prostratic Hyperplasia.
3. Specialty Care - Neuroscience has a varied portfolio, with specialty products in the Neurology and Psychiatric segments.
4. Hospital Care, offers products in the field of anesthesiology and neonatology namely Forane, Sevoflurane and Survant.

The company has over 1000 employees and a state-of-the-art formulation plant at Verna in Goa. The manufacturing locations are designed to produce quality, high volume formulations using cost efficient processes. The plant has well equipped laboratories and trained personnel to ensure international standards of quality at each step of the manufacturing process.

The company has in-house development and medical teams to undertake product and clinical development tailored to the needs of the Indian market.

Abbott provides quality health care worldwide by creating healthcare solutions, which directly affects the life of the common man.

Vision

To be the world's premier health care company

Dedication

To employees, customers, shareholders, suppliers and the public

Strategy

Value Based Management is integral philosophy, directed towards maximizing long-term cash flow and shareholder value through:

- Focus on the Company's core profitable segments to build up our position as one of the leading pharmaceutical companies
- Investments in information technology to improve planning and control of operation
- Increased investments in Human Resources Training & Development to upgrade and broaden the skill base of the organization in consonance with changing needs
- Build flexible cost-efficient manufacturing base through a balanced mix of in-house and contract manufacturing

Our Work Culture

Abbott India is an equal opportunity employer and provides a congenial and professional work environment for all its employees, with great emphasis on teamwork. We stimulate innovation, encourage calculated risk taking and accept mistakes as a part of the learning process.

Encourage experiential learning, and believe in clear delegation of authority and acceptance of personal accountability. We value the involvement of our colleagues in bringing the best to our organization in a spirit of understanding, trust and appreciation of cultural differences. They are open to discussing alternative views and build on constructive feedback.

Our Basic Principle

Respect people: Our people are our strength

A Promise for Life

Turning Science into Caring

They are here for the serving people in their pursuit of healthy lives. This has been the way of Abbott for more than a century – passionately and thoughtfully translating science into lasting contributions to health.

Their products encircle life, from newborns to aging adults, from nutrition and diagnostics through medical care and pharmaceutical therapy.

Caring is central to the work we do and defines our responsibility to those we serve:

Abbott's advance leading-edge science and technologies that hold the potential for significant improvements to health and to the practice of health care.

Value our diversity – that of our products, technologies, markets and people – and believe that diverse perspectives combined with shared goals inspire new ideas and better ways of addressing changing health needs.

Focus on exceptional performance – a hallmark of Abbott people worldwide – demanding of ourselves and each other because our work impacts people's lives.

They strive to earn the trust of those we serve by committing to the highest standards of quality, excellence in personal relationships, and behaviour characterized by honesty, fairness and integrity.

They sustain success – for our business and the people we serve – by staying true to key tenets upon which our company was founded over a century ago: innovative care and a desire to make a meaningful difference in all that we do.

The promise of Abbott is in the promise that our work holds for health and life.

Chapter-3

Background of Project

INTRODUCTION

Situational analysis was done during entire project, the project was undertaken in order to know the prescription pattern of doctors for prescribing combination of cefpodoxime and clavulanic acid. An attempt was made to know about different brands of cefpodoxime and clavulanic acid and their share in Jaipur market.

INTRODUCTION OF COMBINATION

Cefpodoxime is an antibiotic that belongs to third generation cephalosporin. Cefpodoxime is having the broad spectrum antibacterial activities in many illnesses. Cefpodoxime is primarily effective in community acquired pneumonia (CAP) and its efficacy had been proved even earlier. Several studies carried out in the past have proved its effective response in surgical prophylaxis, skin and soft tissue infections, and both upper and lower respiratory tract infection. In the due course the cefpodoxime found to face resistance and there were many reports about its resistance by bacteria. Therefore, the cefpodoxime was started using in combination with the B-lactamase inhibitor-clavulanic acid. Thereby, the problem met with cefpodoxime with regard to resistance was successfully managed.

Cefpodoxime is having the property of fighting effectively against wide range of bacteria and it is more or less similar to other B-lactam antibiotics. Cefpodoxime works by way of damaging the bacterial cell through inhibiting the synthesis of peptidoglycan layer of bacterial cell wall. In most of the gram-positive organisms, the peptidoglycan layer is considered to be the most important layer that enhances the cell wall structural integrity. As it is well known, clavulanic acid is an inhibitor that inhibits B-lactamase enzyme. The B-lactamase enzyme is the main culprit that makes any antibiotic as ineffective though they have broad-spectrum antibacterial activity. Clavulanic acid apart from sharing the B-lactam ring that is the character of B-lactam antibiotics, the clavulanic acid is also having a meager quality of antimicrobial activity. But, clavulanic acid strongly acts as an effective inhibitor of B-lactamase secreted by bacteria which brings out the resistant incidence to beta-lactam antibiotic. Generally, clavulanic acid is well absorbed and dissented after oral treatment. The plasma life of clavulanic acid is one hour and its

protein binding is 30%. The most portion of the clavulanic acid (about 60%) is excreted in the urine unchanged. The cefpodoxime is safeguarded from B-lactamase enzymes by clavulanic acid and therefore the efficacy of cefpodoxime to fight against bacteria is increased and resistance is being eliminated. Cefpodoxime extends good Antibacterial spectrum. Cefpodoxime exerted a strong activity even in its trial itself and shown active against a wide range of gram-negative and gram-positive bacteria. Its combination with clavulanic acid has shown good result against wide range of bacteria.

MECHANISM OF ACTION:

Cefpodoxime, a third generation semi-synthetic cephalosporin, exhibits activity against several Gram positive as well as Gram negative microorganisms. This compound is also stable in beta lactamase environment. Cefpodoxime exhibits exceptional activity against methicillin susceptible Staphylococci, Streptococcus pneumoniae, Haemophilus influenzae, Neisseria spp, and Moraxella catarrhalis, which are referred as the most common hospital acquired and community acquired infections.

Clavulanic Acid, a natural inhibitor of beta lactamase, which are produced by Streptomyces clavuligerus binds to beta lactamase moieties and inactivates them, thus restricting the cefpodoxime destruction. Clavulanic acid has very little antimicrobial activity.

PHARMACOKINETICS:

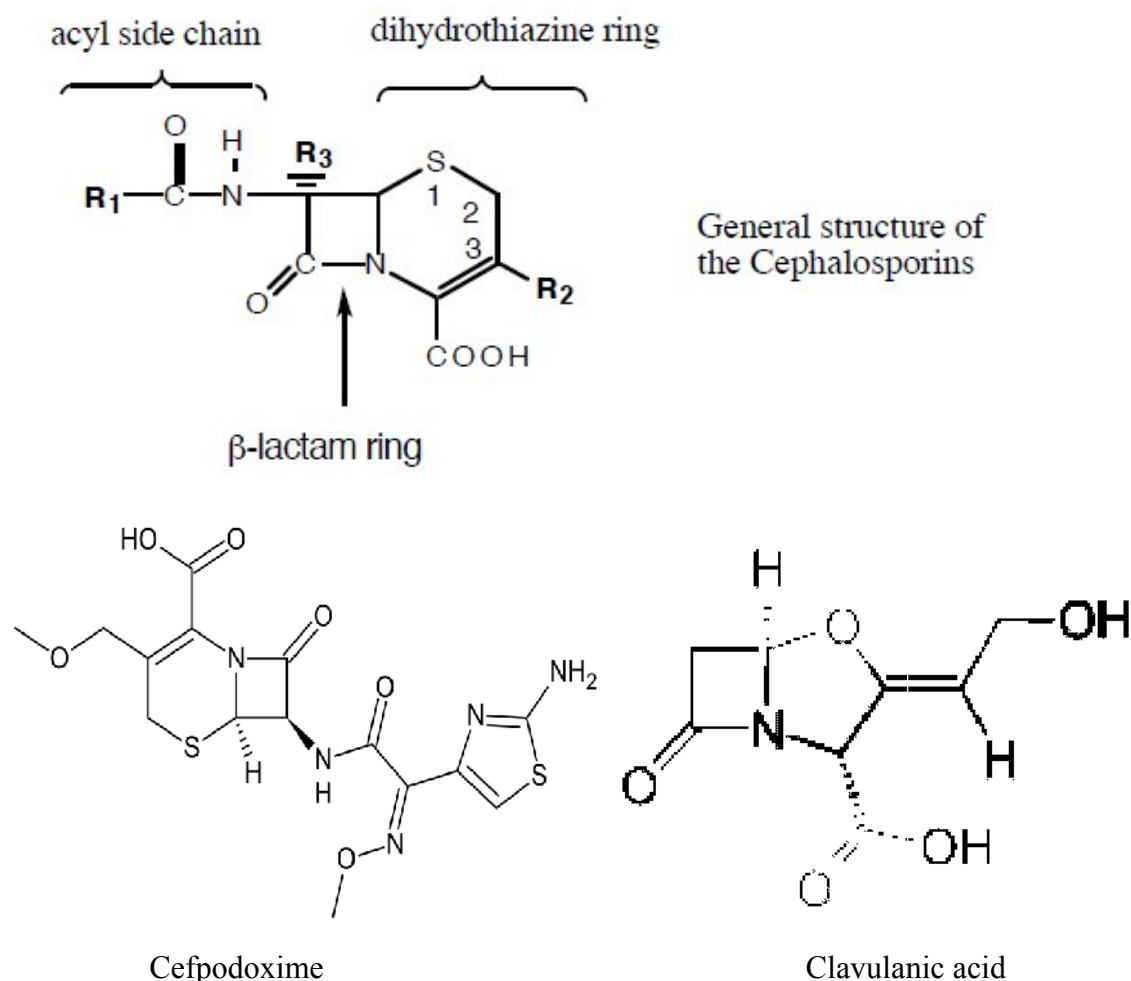
Cefpodoxime: Bioavailability of cefpodoxime is 50% in fasting subjects and it increases in presence of food. Peak plasma concentration of Cefpodoxime 200 mg single dose is 2.18mcg/ml. The Drug is well distributed after oral administration. Cefpodoxime reaches therapeutic concentrations in respiratory tract and genito-urinary tracts and bile. Protein binding of cefpodoxime ranges from 20 to 30 %. The plasma half life of cefpodoxime is about 2 to 3 hours and is prolonged in patients with impaired renal function. Cefpodoxime is excreted unchanged in urine.

Clavulanic Acid: Clavulanic acid is well absorbed after oral administration. Peak plasma concentration of Clavulanic acid 125 mg single dose is 2.2mcg/ml. It is distributed completely after oral administration. Protein binding of clavulanic acid is about 30 %. The plasma half life of clavulanic acid is one hour About 60 % of clavulanic acid is excreted unchanged in urine. The clavulanic acid component in the drug combination protects

cefpodoxime from degradation by β -lactamase enzymes, and effectively extends the antibiotic spectrum of cefpodoxime to include many bacteria that are normally resistant to cefpodoxime and other β -lactam antibiotics.

CHEMISTRY OF CEPHALOSPORINS:

Cephalosporins are β -lactam antibiotics that differ from the penicillins in that the B ring is a 6-membered dihydrothiazine ring. Variations among the cephalosporins are made on either the acyl side chain at the 7-position to change antibacterial activity or at the 3-position to alter the pharmacokinetic profile. Cephalosporin C was first isolated in 1948 by Dr. Abraham from a fungus, *Cephalosporium acremonium*, collected in seawater near a sewage outlet in Sardinia



- Gram-negative bacteria- moraxella catarrhalis, neisseria gonorrhoeae, k.oxytoca, prov. stuarti, proteus mirabilis, serratia marcescens, moragnella morgani, enterobacter cloacae, haemophilis influenza, providencia rettgeri, klebsiella pneumoniae, eldencia coli, p.vulgaris, citrobacter freundii, k.oxytoca.
- Gram-positive bacteria- strep. agalactia, staph. aureus, staph. epidermidis, staph. saprophyticus, strep. pneumoniae, enterococcus faecalis, strep. pyogenes.

Project Title

To study the prescription trend, sales and availability of cefpodoxime and clavulanic acid in jaipur market

Objective

- To find out the prescription trend of the combination of cefpodoxime and clavulanic acid
- To find out the various brands of combination of cefpodoxime and clavulanic acid
- To find out the market share of these brands

Research Methodology.

Type of research

Primary Market Research

Method of Development

Personal interview with chemist and doctors, with the help of questionnaires

Sample Size

70 Chemists

40 Doctors

Sampling method

Convenient Sampling

Duration

1st May to 10th June 2012

Location

Jaipur

Chapter-4

DATA ANALYSIS AND INTERPRETAION

Analysis from Doctors data

- Preference of brand by urologist with the combination of cefpodoxime and clavulanic acid

S No.	Brand	Preferred by Urologist	Percentage
1.	Pecef Duo	6	37%
2.	CepodemXP	4	25%
3.	Zedocef CV	2	13%
4.	No preference	4	25%

Table No. 4.1 Preferred brands by Urologist

Inference: - Preferred brand by the urologist is Pecef Duo followed by the CepodemXP

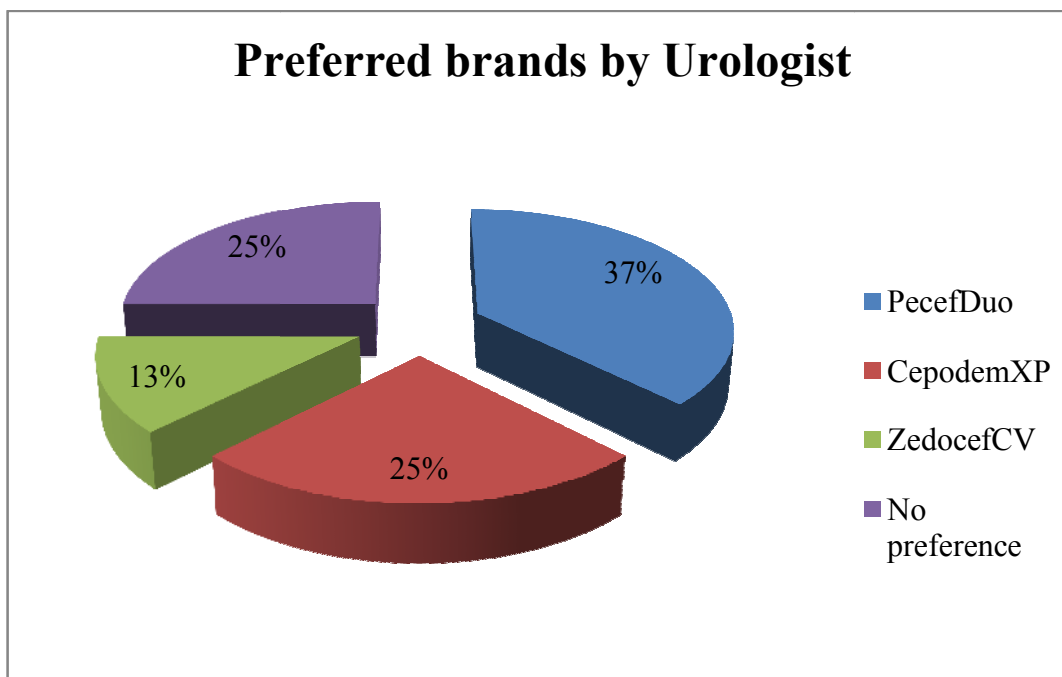


Figure No. 4.1 Preferred brands by Urologist

and ZedocefCV and other than these 25% of Urologist write generic name in the prescription

- **Preference of brand by General surgeon with the combination of cefpodoxime and clavulanic acid**

S No.	Brand	Preferred by General Surgeon	Percentage
1.	Cepodem XP	5	33%
2.	Pecef Duo	4	27%
3.	Zedocef CV	2	13%
4.	No preference	4	27%

Table No. 4.2 Preferred brands by General surgeon

Inference: -Preferred brand by the urologist is Cepodem XP followed by the Pecef

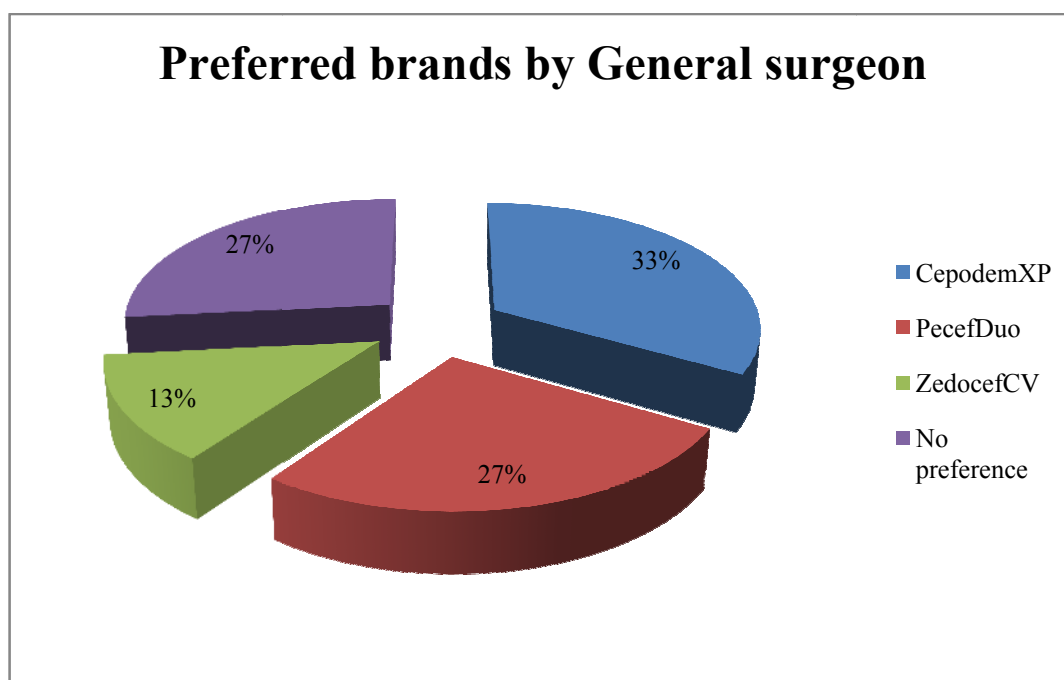


Figure No. 4.2 Preferred brands by General surgeon

Duo and Zedocef CV and other than these 27% of General surgeon write generic name in the prescription

- Duration of treatment with this combination**

S no	Duration of treatment		
1.	7 days	24 Doctors	60%
2.	5 days	16 Doctors	40%

Table No. 4.3 Duration of treatment

Inference: - 60% doctors preferred 7 days duration for treatment with the combination of

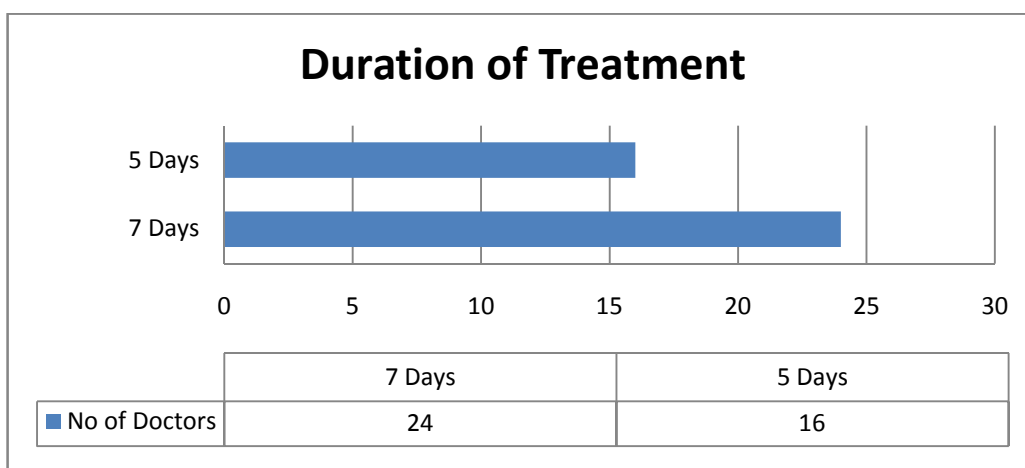


Figure No. 4.3 Duration of treatment

cefpodoxime and clavulanic acid and rest 40% prefer 5 days of duration for treatment

- Does the price of the product matters to you while prescribing the product?**

S No	Does the price of the product matters to you while prescribing the product?		
1.	Yes	35	87.5%
2.	No	5	12.5%

Table No. 4.4 Matter of price while selecting product

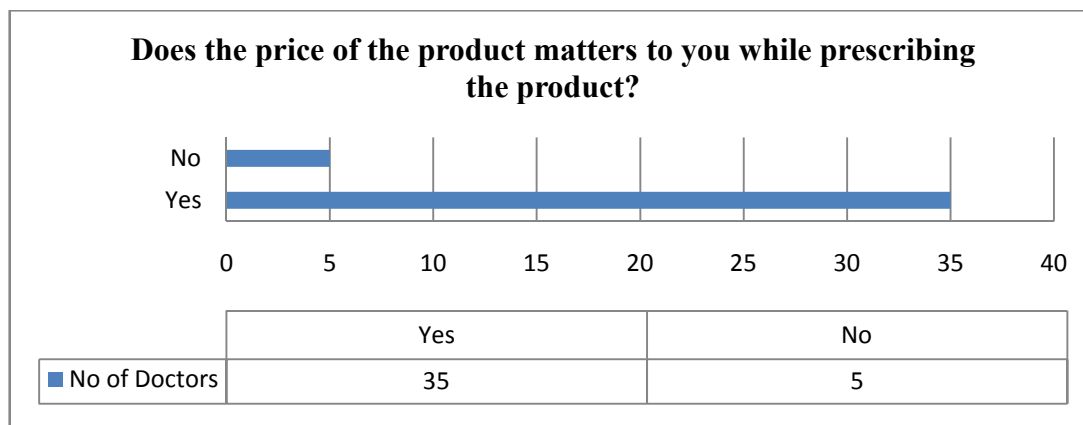


Figure No. 4.4 Matter of price while selecting product

Analysis from Chemist data

- Brands of cefpodoxime and Clavulanic acid combination mentioned in prescription

Brands mentioned in prescription are Pecef duo (Dr reddys), CepodemXP(Ranbaxy), DoxcefCV (Lupin), ZedocefCV(Macleods) and other then these brands generic name of the drug present in prescription

Generic name	Pecef Duo	CepodemXP	DoxcefCV	ZedocefCV	Total
869	616	574	407	129	2595

Table No. 4.5 Brands Mentioned in prescription

Inference: - Pecef duo is the brand which presents in almost every fourth prescription

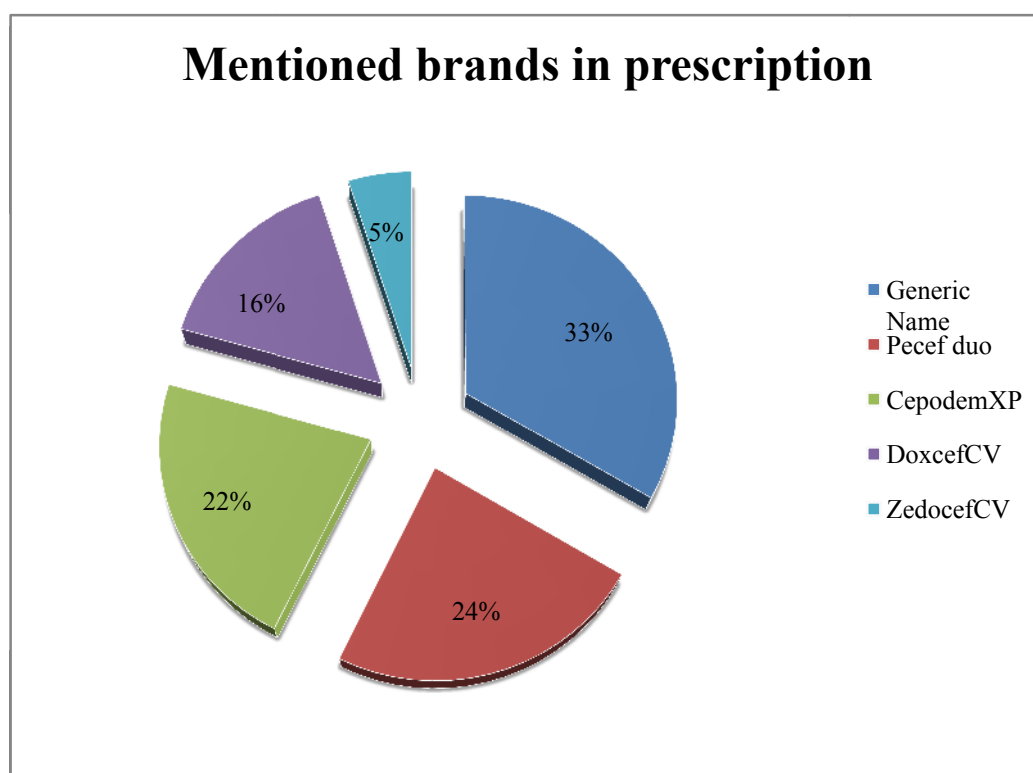


Figure No. 4.5 Brands Mentioned in prescription

followed by the Cepodem XP, Doxcef CV and Zedocef CV, where 33% of total prescription containing generic name.

- **Market share of Cefpodoxime and clavulanic acid brands on the basis of a week sale in Jaipur**

S No	Brands available	No of Strip sold
1.	Pecef Duo	829
2.	Cepodem XP	812
3.	Zedocef CV	433
4.	Doxcef CV	879
5.	Gudcef CV	319
6.	Pod Plus	119
7.	Wokocef	160
8.	Zipod	83
9.	Augpod	41
10.	Macpod	32

Table No. 4.6 Market share of cefpodoxime and clavulanic acid combination

Inference: - Doxcef CV (Lupin) 24% is the most selling brand with the combination of cefpodoxime and clavulanic acid followed by the Pecef duo (Dr. Reddys) and Cepodem

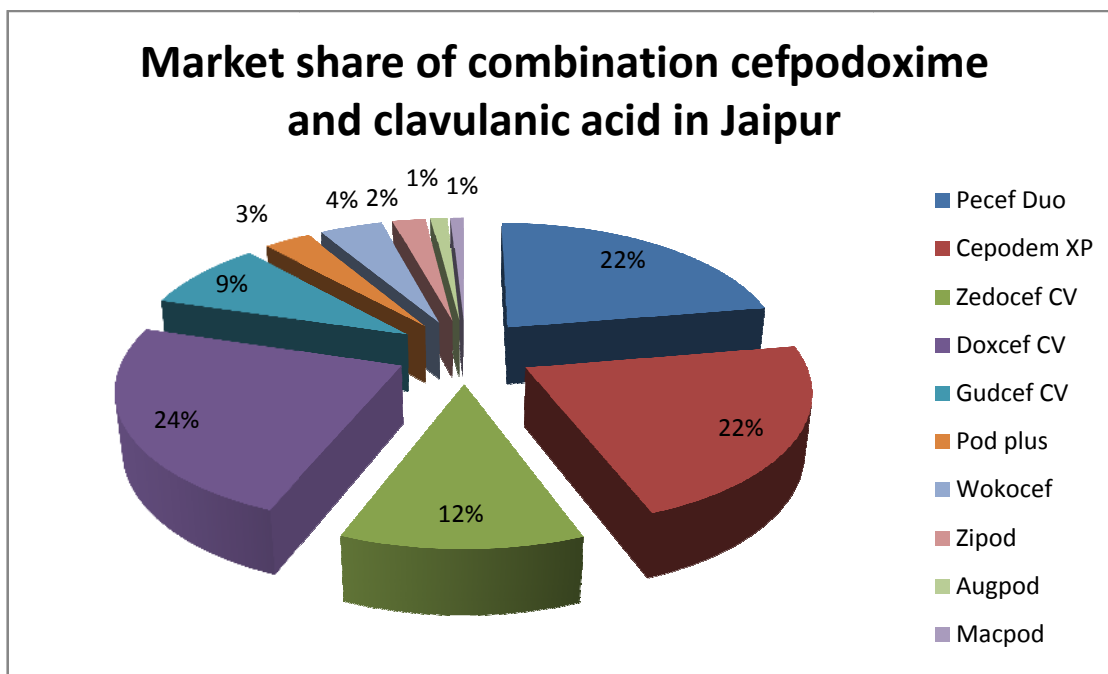


Figure No. 4.6 Market share of cefpodoxime and clavulanic acid combination

XP (Ranbaxy) with market share of 22% each, followed by Zedocef CV (Macleods) 12%, Gudcef CV (Mankind) 9%, Wokocef 4%, Pod plus 3%, Zipod 2%, Augpod 1% and Macpod 1%.

Chapter-5

Conclusion

- Doctors with the specialization of urologist and general surgery prefer the brand pecef duo of combination cefpodoxime and clavulanic acid over the other brand with this combination
- Duration of treatment with the preferences of doctors is 7 days (bid). Packing of the products available in the market containing combination of cefpodoxime and clavulanic acid is 10 tablets per strip. I came to the conclusion from my study is that number of tablets per strip should be 14 so that the product could be made more affordable to the patients
- Doxcef CV is the most selling brand in Jaipur with the combination of cefpodoxime and clavulanic acid covering the 24% of market share.

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Annexure

Name of doctor: _____

Specialization: _____

Location of hospital/clinic: _____

1. How many Patients do you examine daily?

a. Less than 10

c. 20-30

b. 10-20

d. More than 30

2. How many patients required this combination of Cefpodoxime and Clavulanic acid?

3. Indication in which this combination is required?

4. What doses of Cefpodoxime are required in treatment?

5. What is the duration of treatment?

6. Any preference of brand with this combination?

7. Does the price of the product matters to you while prescribing the product?

a. Yes

b. No

8. Advantage of prescribed brand over the others?

Name of chemist: _____

Location of store: _____

1. Number of prescription received with combination of Cefpodoxin and Clavulanic acid (in a week)?

2. Brands of this combination mentioned in prescription?

3. Which brands are generally available at your counter with this combination?

4. How many units are sold at this counter per week? (1 unit = 1 strip of 10)

a. Less than 50

c. 150-250

b. 50-150

d. More than 250

5. Most selling brand of this combination is?

6. Is there any special promotion activity by the company at your counter?

7. What is your opinion for prescribed brand and other brand?
