BP 505 T. PHARMACEUTICAL JURISPRUDENCE (Theory)

45 Hours

Scope: This course is designed to impart basic knowledge on important legislations related to the profession of pharmacy in India.

Objectives: Upon completion of the course, the student shall be able to understand:

1. The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals.
2. Various Indian pharmaceutical Acts and Laws
3. The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
4. The code of ethics during the pharmaceutical practice

Course Content:

UNIT-I — 10 Hours

Drugs and Cosmetics Act, 1940 and its rules 1945:

Objectives, Definitions, Legal definitions of schedules to the Act and Rules

Import of drugs – Classes of drugs and cosmetics prohibited from import, Import under license or permit. Offences and penalties.

Manufacture of drugs – Prohibition of manufacture and sale of certain drugs,

Conditions for grant of license and conditions of license for manufacture of drugs, Manufacture of drugs for test, examination and analysis, manufacture of new drug, loan license and repacking license.

UNIT-II — 10 Hours

Drugs and Cosmetics Act, 1940 and its rules 1945.

Detailed study of Schedule G, H, M, N, P,T,U, V, X, Y, Part XII B, Sch F & DMR (OA)

Sale of Drugs – Wholesale, Retail sale and Restricted license. Offences and penalties

Labeling & Packing of drugs- General labeling requirements and specimen labels for drugs and cosmetics, List of permitted colors. Offences and penalties.

Administration of the Act and Rules – Drugs Technical Advisory Board, Central drugs Laboratory, Drugs Consultative Committee, Government drug analysts, Licensing authorities, controlling authorities, Drugs Inspectors

UNIT-III — 10 Hours

- **Pharmacy Act –1948:** Objectives, Definitions, Pharmacy Council of India; its constitution and functions, Education Regulations, State and Joint state pharmacy councils; constitution and functions, Registration of Pharmacists, Offences and

Penalties

- **Medicinal and Toilet Preparation Act –1955:** Objectives, Definitions, Licensing, Manufacture In bond and Outside bond, Export of alcoholic preparations, Manufacture of Ayurvedic, Homeopathic, Patent & Proprietary Preparations. Offences and Penalties.
- **Narcotic Drugs and Psychotropic substances Act-1985 and Rules:** Objectives, Definitions, Authorities and Officers, Constitution and Functions of narcotic & Psychotropic Consultative Committee, National Fund for Controlling the Drug Abuse, Prohibition, Control and Regulation, opium poppy cultivation and production of poppy straw, manufacture, sale and export of opium, Offences and Penalties

UNIT-IV 08 Hours

- **Study of Salient Features of Drugs and Magic Remedies Act and its rules:** Objectives, Definitions, Prohibition of certain advertisements, Classes of Exempted advertisements, Offences and Penalties
- **Prevention of Cruelty to animals Act-1960:** Objectives, Definitions, Institutional Animal Ethics Committee, CPCSEA guidelines for Breeding and Stocking of Animals, Performance of Experiments, Transfer and acquisition of animals for experiment, Records, Power to suspend or revoke registration, Offences and Penalties
- **National Pharmaceutical Pricing Authority:** Drugs Price Control Order (DPCO)-2013. Objectives, Definitions, Sale prices of bulk drugs, Retail price of formulations, Retail price and ceiling price of scheduled formulations, National List of Essential Medicines (NLEM)

UNIT-V 07 Hours

- **Pharmaceutical Legislations** – A brief review, Introduction, Study of drugs enquiry committee, Health survey and development committee, Hathi committee and Mudaliar committee
- **Code of Pharmaceutical ethics** D efinition, Pharmacist in relation to his job, trade, medical profession and his profession, Pharmacist's oath
- **Medical Termination of Pregnancy Act**
- **Right to Information Act**
- **Introduction to Intellectual Property Rights (IPR)**

Recommended books: (Latest Edition)

1. Forensic Pharmacy by B. Suresh

2. Text book of Forensic Pharmacy by B.M. Mithal
3. Hand book of drug law- by M.L. Mehra
4. A text book of Forensic Pharmacy by N.K. Jain
5. Drugs and Cosmetics Act/Rules by Govt. of India publications.
6. Medicinal and Toilet preparations act 1955 by Govt. of India publications.
7. Narcotic drugs and psychotropic substances act by Govt. of India publications
8. Drugs and Magic Remedies act by Govt. of India publication
9.Bare Acts of the said laws published by Government. Reference books (Theory)

BP804 ET: PHARMACEUTICAL REGULATORY SCIENCE (Theory)

45Hours

Scope: This course is designed to impart the fundamental knowledge on the regulatory requirements for approval of new drugs, and drug products in regulated markets of India & other countries like US, EU, Japan, Australia,UK etc. It prepares the students to learn in detail on the regulatory requirements, documentation requirements, and registration procedures for marketing the drug products.

Objectives: Upon completion of the subject student shall be able to;

1. Know about the process of drug discovery and development
2. Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
3. Know the regulatory approval process and their registration in Indian and international markets

Course content:

Unit I — 10Hours

New Drug Discovery and development

Stages of drug discovery, Drug development process, pre-clinical studies, non-clinical activities, clinical studies, Innovator and generics, Concept of generics, Generic drug product development.

Unit II — 10Hours

Regulatory Approval Process

Approval processes and timelines involved in Investigational New Drug (IND), New Drug Application (NDA), Abbreviated New Drug Application (ANDA). Changes to an approved NDA / ANDA.

Regulatory authorities and agencies

Overview of regulatory authorities of India, United States, European Union, Australia, Japan, Canada (Organization structure and types of applications)

Unit III — 10Hours

Registration of Indian drug product in overseas market

Procedure for export of pharmaceutical products, Technical documentation, Drug Master Files (DMF), Common Technical Document (CTD), electronic Common Technical

Document (eCTD), ASEAN Common Technical Document (ACTD) research.

Unit IV 08 Hours

Clinical trials

Developing clinical trial protocols, Institutional Review Board / Independent Ethics committee - formation and working procedures, Informed consent process and procedures, GCP obligations of Investigators, sponsors & Monitors, Managing and Monitoring clinical trials, Pharmacovigilance - safety monitoring in clinical trials

Unit V 07 Hours

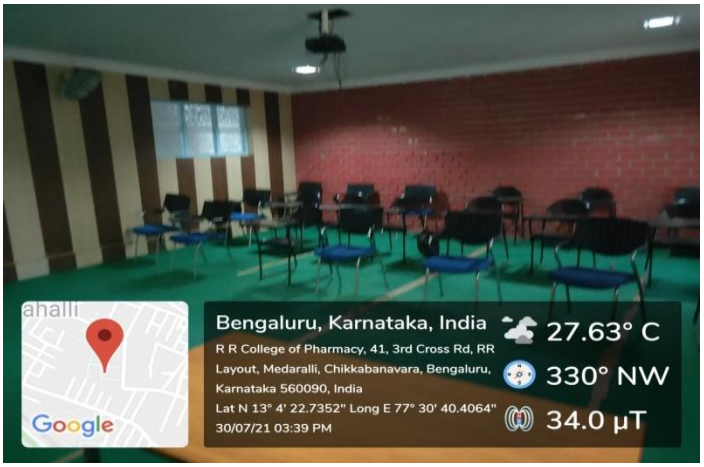
Regulatory Concepts

Basic terminology, guidance, guidelines, regulations, Laws and Acts, Orange book, Federal Register, Code of Federal Regulatory, Purple book

Recommended books (Latest edition):

1. Drug Regulatory Affairs by Sachin Itkar, Dr. N.S. Vyawahare, Nirali Prakashan.
2. The Pharmaceutical Regulatory Process, Second Edition Edited by Ira R. Berry and Robert P. Martin, Drugs and the Pharmaceutical Sciences, Vol.185. Informa Health care Publishers.
3. New Drug Approval Process: Accelerating Global Registrations By Richard A Guarino, MD, 5th edition, Drugs and the Pharmaceutical Sciences, Vol.190.
4. Guidebook for drug regulatory submissions / Sandy Weinberg. By John Wiley & Sons. Inc.
5. FDA Regulatory Affairs: a guide for prescription drugs, medical devices, and biologics /edited by Douglas J. Pisano, David Mantus.
6. Generic Drug Product Development, Solid Oral Dosage forms, Leon Shargel and Isader Kaufer, Marcel Dekker series, Vol.143
7. Clinical Trials and Human Research: A Practical Guide to Regulatory Compliance By Fay A. Rozovsky and Rodney K. Adams
8. Principles and Practices of Clinical Research, Second Edition Edited by John I. Gallin and Frederick P. Ognibene
9. Drugs: From Discovery to Approval, Second Edition By Rick Ng

PROJECTORS



DIGITAL COMPUTER LAB

EDUCATIONAL VIDEOS

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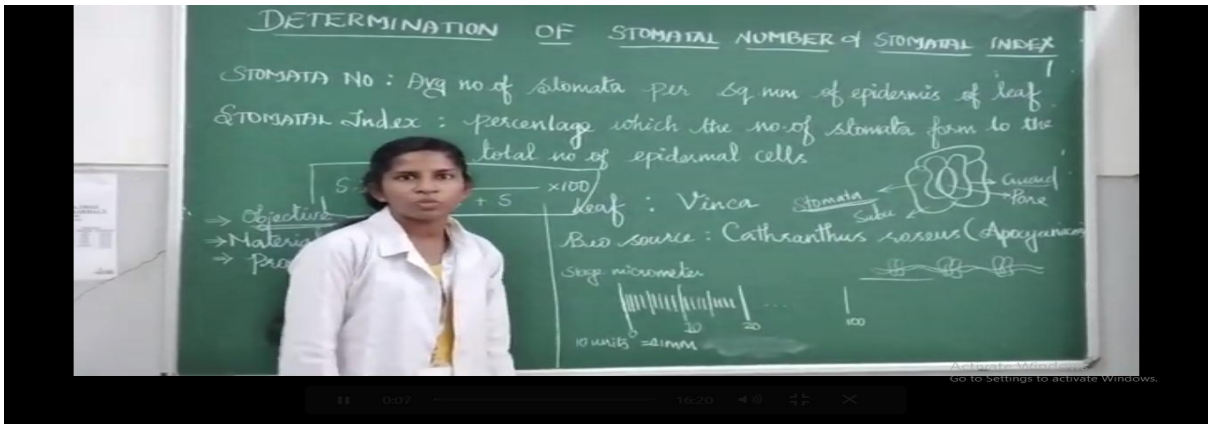

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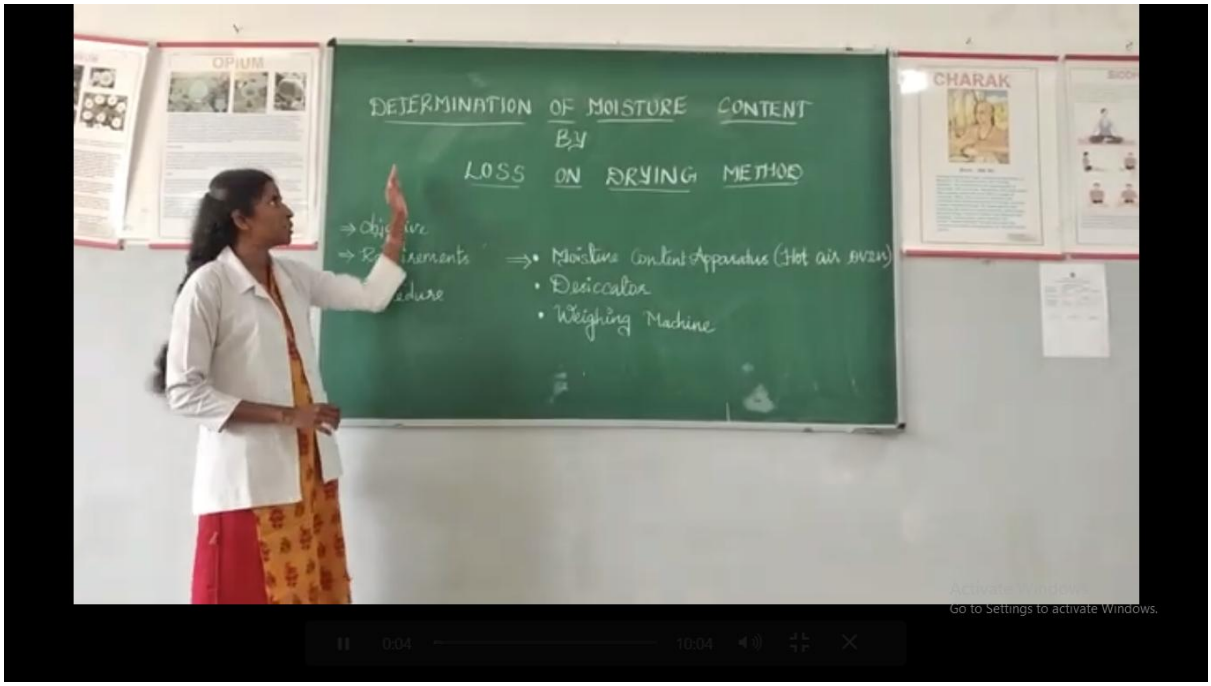

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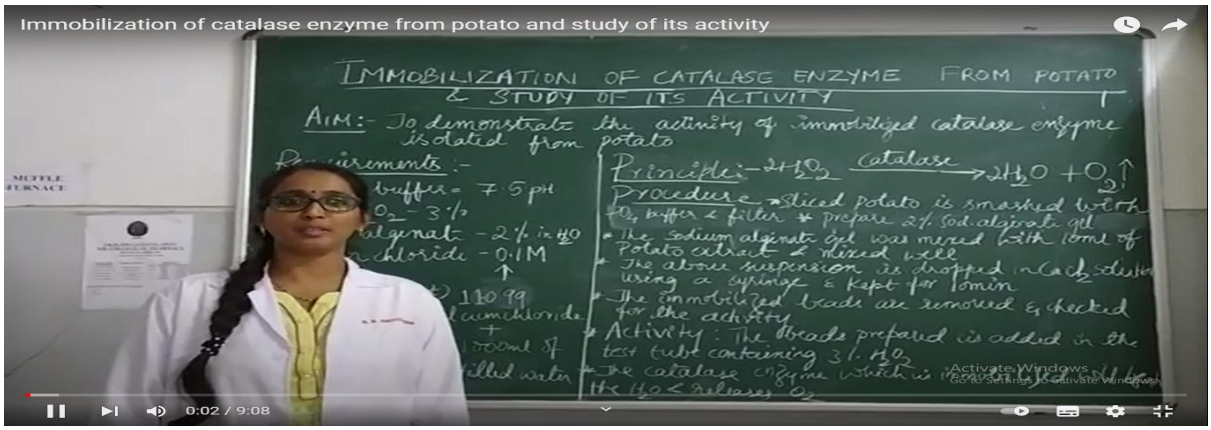
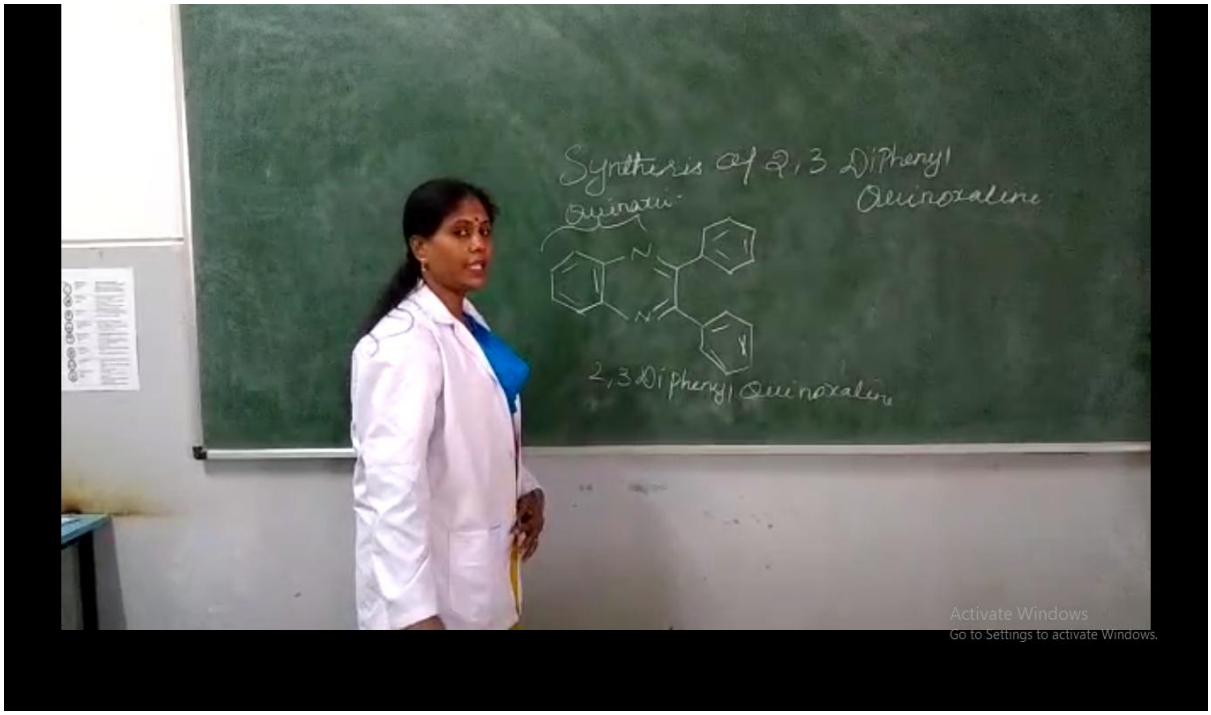
https://www.sigmaaldrich.com/life_science/biochemicals





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Name - Pontia Halder
Roll No - 15
College ID No - 19PD019
Sub - Pharmaceutical Microbiology
2nd Years Pharm D

Date - 23/3/20

Bacteria :-

> Bacteria defined as microscopic single called organism that can penetrate into healthy tissues and start multiplying into vast numbers.

> These are unicellular, free living small microorganism which are visible under the light microscope.

> Those are belongs to kingdom prokaryotae (Monera)

> They occurs in water, soil, air and all natural environments.

- The size and shape vary between the dimensions of 0.75 to 4.0 μm.
- The cocci diameter near about 1 μm and baciliare 1 to 8 μm
- They are found in spherical shape i.e. Coccoid forms or as cylindrical form i.e. rod shaped forms.

Shape of Bacteria :-

- ~~One~~ On the basis of shape, bacteria are classified as follows -

(i) Cocci (Small, spherical or oval in shape)
(ii) Bacilli (Rod in shape)
(iii) Vibrios (Comma in shaped, curved rods)
(iv) Spirilla (longer rigid rods with several curves ~~or coil~~ or coils)
(v) Spirochetes (slender and flexuous spiral forms)
(vi) Actinomycetes (branching filamentous bacteria)
(vii) Mycoplasams (round and oval bodies)

Silent features :-

The silent features of the structure of a bacterial cell are as stated under :-

(A) N-acetyl glucosamine

(B) N-acetyl-3-O-1-carboxymethylglucosamine

are usually cross-linked by peptide ~~chains~~ chains ~~as shown under~~ :

Gram negative-bacteria - by alcohol washing the dye-complex from certain types of cells and.

Gram positive bacteria - by retaining the dye-complex despite the prescribed alcohol-washing.

The bacterial cell wall has two major roles to play :-

(a) to protect the cell against osmotic rupture particularly in diluted media and also against certain possible mechanical damages.

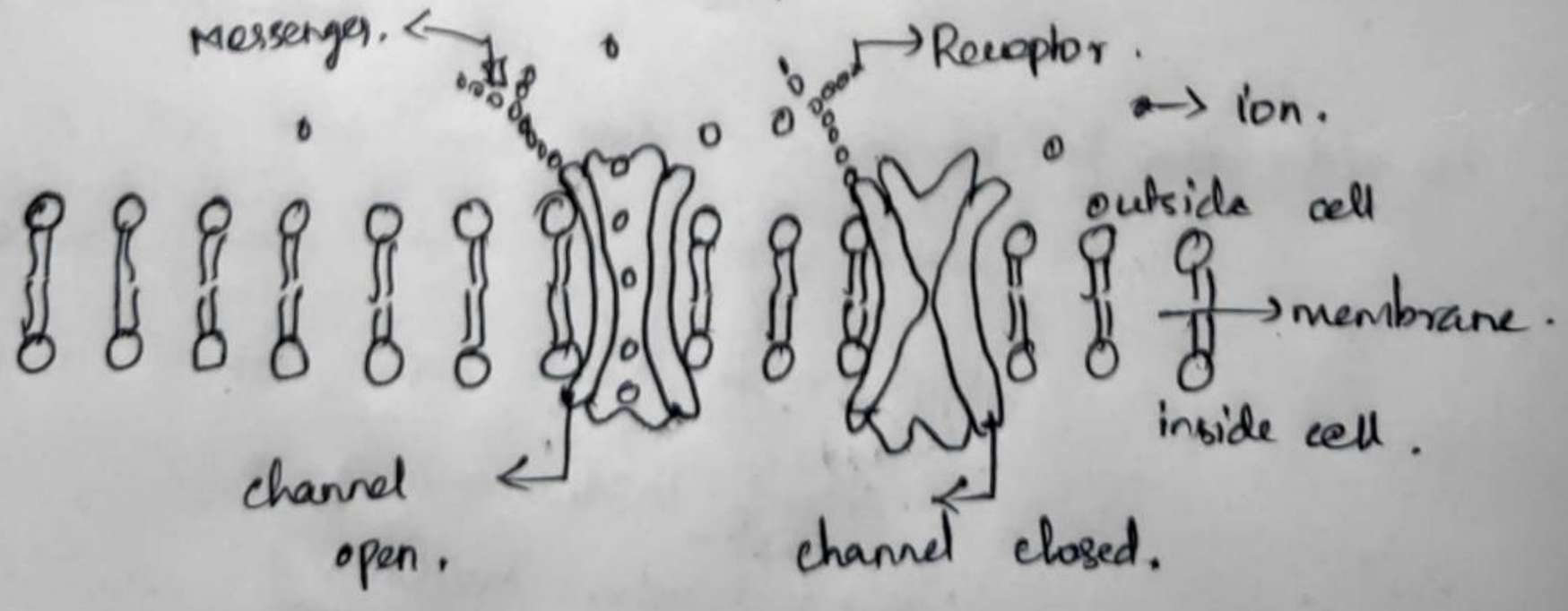
(b) to assign bacterial shapes; their subsequent major division into gram positive and gram negative microorganisms and their antigenic attributes.

Assignment.

1). Ligand-gated ion channels (LGICs):

i) These are integral membrane proteins that contain a pore which allows the regulated flow of selected ions across the plasma membrane. Ion flux is passive and driven by the electrochemical gradient for the permanent ions. The channels are opened, or gated by the binding of a neurotransmitter to an allosteric site (s) that triggers a conformational change that result in the conduction state.

ii) Modulation of gating can occur by the binding of endogenous, or exogenous, modulators to allosteric sites. LGICs mediate fast synaptic transmission, on a millisecond time scale, in the nervous system and at the somatic neuromuscular junction. such transmission involves the release of a neurotransmitter from a pre-synaptic neurone and the subsequent activation of post-synaptically located receptor that mediated a rapid, phasic, electrical signal (The excretory- or inhibitor, post-synaptic potential). However, in addition to their traditional role in phasic.



3) Intracellular receptor :-

i) These receptors are located inside the cell rather than on it cell membrane. classic hormones that use intracellular receptor include thyroid and steroid hormones. Examples are the class of nuclear receptors located in the cell nucleus and cytoplasm and the IP_3 receptor located on the endoplasmic reticulum.

ii) The ligands that binds to them are usually intracellular second messengers like inositol triphosphate (IP_3) and extracellular lipophilic hormones like steroid hormones some intracrine peptide hormones also have intracellular receptors.

2) GPCR receptor :-

G protein - coupled receptor (GPCR), also called seven-transmembrane receptor or heptahelical receptor, protein located in the cell membrane that binds extracellular substances and transmits signals from thes substances to an intracellular molecule called a G-protein (guanine nucleotide binding pratien.

FORMULATION AND EVALUATION OF GANCICLOVIR NOVEL BCCOADHESIVE TABET WITH DIFFERENT POLYMER

By

DEEPENDRA KUMAR GOUND
B. Pharm.,

Reg.No.17PU267

A Dissertation Submitted to the

Rajiv Gandhi University of Health Sciences, Karnataka, Bangalore

In partial fulfillment of the requirements for the

MASTER OF PHARMACY
In
PHARMACEUTICS

Under the guidance of

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ASSOCIATE PROFESSOR

Since 1993

DEPARTMENT OF PHARMACEUTICS,
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2017-2019

FORMULATION AND EVALUATION OF PIOGLITAZONE ETHOSOMES FOR DIABETES

By

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FORMULATION AND EVALUATION OF NORFLOXACIN PERIODONTAL FILM FOR LOCAL DELIVERY

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2017-2019

FORMULATION DESIGN AND *IN-VITRO* EVALUATION OF TRANSDERMAL PATCHES OF LINAGLIPTIN HYDROCHLORIDE

By

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FORMULATION AND EVALUATION OF COLON TARGETED DRUG DELIVERY SYSTEM OF ETODOLAC TABLETS

By

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April 2018

"PREPARATION AND EVALUATION OF FAST DISSOLVING SUBLINGUAL FILMS OF KETOROLAC BY USING MUCILAGE OF *VIGNA MUNGO* AND *TRIGONELLA FONEUM GRACEUM* SEEDS"

By

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APRIL 2018

PREPARATION AND EVALUATION OF TOPICAL PRONIOSOMAL GEL LOADED WITH SERTACONAZOLE

By

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April 2018

"COMPARATIVE STUDY OF *BASELLA ALBA* AND CROSCARMELLOSE SODIUM AS A SUPERDISINTEGRANTS IN THE FORMULATION OF RANITIDINE HYDROCHLORIDE FAST DISPERSIBLE TABLETS"

BY

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BANGALORE-560090

APRIL 2018

STUDY OF ENHANCEMENT IN RATE OF DISINTEGRATION OF DESLORATADINE FAST DISPERSIBLE TABLETS BY SUBLIMATION METHOD

By

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BENGALURU-560090

2017

"FORMULATION AND CHARACTERIZATION OF *HIBISCUS ESCULENTUS* MUCILAGE BASED SUBLINGUAL ORAL STRIPS OF SALBUTAMOL SULPHATE"

By

KAVITA YADAV, B.Pharm

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2017

"PREPARATION AND *IN-VITRO* CHARACTERIZATION OF REPAGLINIDE SOLID DISPERSION"

By

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Under the guidance of

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2/6/17

2/6/17

DEPARTMENT OF PHARMACEUTICS
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BENGALURU-560090

2017

Rajiv Gandhi University of Health Sciences, Karnataka

FOMULATION AND EVALUATION OF FAST DISPERSIBLE TABLETS OF CEFADROXIL WITH SUPERDISINTEGRANTS OF NATURAL AND SYNTHETIC ORIGIN

BY

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2017

DESIGN OF FLOATING *IN SITU* GEL OF MUCOLYTIC AGENT BY CATION INDUCED GELATION OF NATURAL POLYSACCHARIDES

BY

NIRAJ PATHAK, B. Pharm

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2015-2017

Rajiv Gandhi University of Health Sciences, Karnataka

"A STUDY ON IMPROVENT OF DISSOLUTION PROFILE OF ETODOLAC BY LIQUISOLID COMPACT TECHNIQUE"

By

Mr. UTTAM KUMAR GUPTA
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2015-2017

STUDY OF MUCOADHESIVE EFFECT OF MORINGA OLIFERA GUM ON GASTRO RETENTIVE TABLETS OF BACLOFEN

By

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Evaluated

1/6/17

1/6/17

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2015-2017

Rajiv Gandhi University of Health Sciences, Karnataka

"FORMULATION AND EVALUATION OF FAST DISINTEGRATING SUBLINGUAL TABLETS OF ANTI VERTIGO DRUG"

By

ROSHAN M JAIN, B. Pharm.,
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R.R COLLEGE OF PHARMACY, BENGALURU-560090

JUNE-2020

DESIGN AND *IN-VITRO* EVALUATION OF TRANSDERMAL PATCHES OF LOVASTATIN

By

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(2019-2020)

FORMULATION AND EVALUATION OF FLOATING TABLET OF CILNIDIPINE AS AN ANTI-HYPERTENSIVE AGENT

By

RUPESH KUMAR SAH, B. Pharm.,

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2019-2020

FORMULATION AND EVALUATION OF FAST DISSOLVING TABLETS OF DEXAMETHASONE

By

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(2018-2020)

FORMULATION AND EVALUATION OF COLON TARGETED MATRIX TABLETS CONTAINING SULFASALAZINE

By

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(2018-2020)

DESIGN AND *IN-VITRO* EVALUATION OF TRANSDERMAL PATCHES OF KETOPROFEN

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MOHAMMAD SAIFUL HADISH, B.Pharm.,

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(2019-2020)

"FORMULATION AND EVALUATION OF FAST DISSOLVING TABLETS OF LEVOSULPIRIDE BY DIRECT COMPRESSION TECHNIQUE USING THREE SUPER DISINTEGRANTS"

By

NEHA KUMARI
B.Pharm.,

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A Dissertation Submitted to the

Rajiv Gandhi University of Health Sciences, Bengaluru, Karnataka

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R.R. COLLEGE OF PHARMACY,
BENGALURU, KARNATAKA -560090
2018-2020

"FORMULATION AND EVALUATION OF RECTAL SUPPOSITORY OF SUCRALFATE"

By

MOHAMED MUSTAFA RAZI, B. Pharm.,
Reg. No. 18PU333

Dissertation Submitted To The

Rajiv Gandhi University of Health Sciences, Karnataka, Bengaluru-560041

In partial fulfillment of the requirements for the

MASTER OF PHARMACY

IN

PHARMACEUTICS

Under The Guidance of

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JUNE-2020

"FORMULATION AND EVALUATION OF DEXLANSOPRAZOLE BUCCAL TABLET WITH DIFFERENT POLYMERS"

BY

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2018-2020

"DESIGN AND *IN-VITRO* EVALUATION OF TRANSDERMAL PATCHES OF ECONAZOLE"

By

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DESIGN AND *IN-VITRO* EVALUATION OF TRANSDERMAL PATCHES CONTAINING VOGLIBOSE

By

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(2019-2020)

"STUDY OF EFFECT OF FENUGREEK EXTRACT AS A SUPERDISINTEGRANT IN THE FORMULATION OF REPAGLINIDE FAST DISSOLVING TABLETS"

BY

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2020

"DESIGN AND CHARACTERISATION OF COLON SPECIFIC MATRIX TABLET OF CURCUMIN BY USING VARIOUS POLYMERS"

By

AKHILA LAKSHMI.N, B. Pharm.,
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"FORMULATION AND EVALUATION OF SUCRALFATE MATRIX TABLETS"

By

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2019- 2021

"PREPARATION AND *IN-VITRO* CHARACTERIZATION OF RESVERATROL SOLID DISPERSIONS"

By

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"FORMULATION AND IN-VITRO EVALUATION OF TRANSDERMAL PATCHES OF CILNIDIPINE"

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2019- 2021

"FORMULATION AND EVALUATION OF CHEWABLE TABLET CONTAINING ESOMEPRAZOLE MAGNESIUM TRIHYDRATE"

By

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2019- 2021

"FORMULATION AND EVALUATION OF MUCOADHESIVE BUCCAL TABLETS OF FELODIPINE"

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2019- 2021

"FORMULATION AND EVALUATION OF SUSTAINED RELEASE MATRIX TABLETS OF AMILORIDE"

BY

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"FORMULATION AND EVALUATION OF ORAL FLOATING DEXLANSOPRAZOLE *IN SITU* GEL FOR GASTROESOPHAGEAL REFLUX DISEASE"

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2019-2021

"DEVELOPMENT AND INVITRO EVALUATION OF MONTELUKAST PRONIOSOMAL GEL FOR ASTHMA"

By

YAMUNA.G.S

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"FORMULATION AND IN-VITRO EVALUATION OF TRANSDERMAL PATCHES OF AMILORIDE"

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"DESIGN AND EVALUATION OF GABAPENTIN MUCOADHESIVE GASTRO RETENTIVE TABLETS"

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2019-2021

"FORMULATION AND EVALUATION OF ORAL FLOATING PIOGLITAZONE HYDROCHLORIDE IN SITU GEL"

By

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August-2021

"FORMULATION AND EVALUATION OF LEVOFLOXACIN ETHOSOMES FOR SKIN DISEASE"

BY

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August 2021

"ISOLATION OF THROMBOLYTIC PRINCIPLE FROM LEAF EXTRACT OF *Amaranthus tricolor*"

By

CRUCIFORTH KHARSYNTIEW , B. Pharm.,

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R.R COLLEGE OF PHARMACY,

CHIKKABANAVARA ,

BENGALURU KARNATAKA-560090

April 2020

ACTIVITY GUIDED FRACTIONATION OF *Cansjera rheedii* FOR ANTILITHIATIC ACTIVITY

By

YOGEESHWAR S M, B. Pharm.,

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BENGALURU-560090

JUNE-2020

BIOSYNTHESIS OF GOLD AND SILVER NANOPARTICLES USING LEAF EXTRACT OF *Achras sapota L. AND* THEIR ANTIMICROBIAL ACTIVITY

By

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BENGALURU-560090

JUNE-2020

P.K.M Educational Trust ®

R R College of Pharmacy

Chikkbanavara, Bangalore - 560090

REPORT ON INDUSTRIAL VISIT (2018-19)

JUGGAT PHARMA (PHARMA DIVISION OF JAGDALE INDUSTRIES PVT. LTD.), BENGALURU

According to Rajiv Gandhi University of Health Sciences, Bengaluru norms, R R College of Pharmacy organized Industrial Visit to Reputed Pharma Industry Juggat Pharma located at Mysore Road, Bengaluru on 23rd August 2018 for IV B Pharm students. This industrial visit was organized with the aim to refurbish them with current knowledge towards the pharmaceutical industrial profession.

Around 74 students took a visit the **JUGGAT PHARMA** under the mentorship of our Faculty member Mr. Subhash P G. The plant manager explained the different departments of industry performing various processes visually, Granulation, Compression, Capsule filling, Blending, Lubrication, d- tooling and packaging. Explanation was a lucrative, informative and learning exposure to students.

Signature of the Faculty member

Principal

P.K.M Educational Trust ®

R R College of Pharmacy

Chikkbanavara, Bangalore - 560090

REPORT ON INDUSTRIAL VISIT (2019-20)

MICROLABS PVT. LTD., BENGALURU

INDUSTRIAL VISIT:

RRCOP organised an industrial visit for final year B. Pharmacy students to upgrade them with current updates in the industrial profession. Students had visited the reputed Pharma Industry **MICROLABS** in Peenya, Bangalore on November 29, 2019. 74 students along with faculty members, Mrs. **Kavitha.S.K** and Mr. **Vishal C S.** The Manager of the industry explained about the various granulation process, compression machines, coating machines, capsule filling machine, blender, lubricant, D- stooling area, batch packing record, tablets punching, blister packaging, strip packaging, cream preparation and filling for the students. It was a very informative and learning experience for our students.

Signature of the Faculty member Principal

PRESENTATION

PAPER PRESENTATION

DESIGN AND CHARACTERIZATION OF COLON SPECIFIC ANTICANCER MATRIX TABLET OF CURCUMIN BY USING VARIOUS POLYMER

Akhilalakshmi.N*[1], K S Srilatha, A.Geethalakshmi

Department of Pharmaceutics, R R College of Pharmacy

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MPH11

ABSTRACT:

The aim of present study was to formulate and evaluate sustained release matrix tablet of curcumin by using various polymers like guar gum , xanthan gum,,hpmc and pectin by using wet granulation method 2% SLS was added to the formulation in order to increase its solubility along with lactose as diluent,talc as glidant ,magnesium sterate as lubricant.tablets were compressed and evaluated for micrometric and physicochemical properties This study was developed for the treatment of colon cancer.

INTRODUCTION:

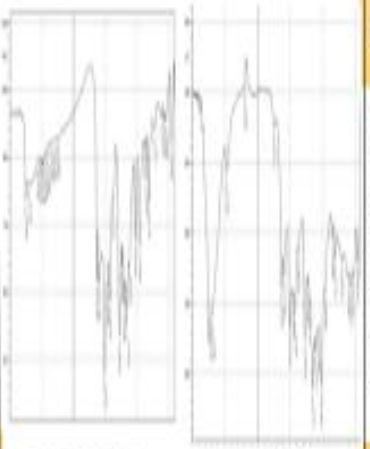
In recent times, colon targeted drug delivery systems have gained importance for delivery of peptide, proteins & also in treatment of different diseases associated with the colon like colon cancer, colitis, ulcerative colon etc. Sustained release dosage forms are designed to achieve better selectivity ,longer duration of action ,reduce the dosage frequency &side effects.one of this sytem include matrix tablet Curcumin is the principal curcuminoid responsible for the yellow color of turmeric &also known for its antitumor, antioxidant, antiarthritic, & anti-inflammatory properties

METHODOLOGY:

Matrix tablet were formulated using wet granulation method Active ingredient curcumin was added in motar and pestle along with lactose as diluent,SLS as solubility enhancer and either guar gum, xanthan gum, HPMC or pectin as polymers in varied concentrations & wetted with appropriate amount of 8%starch soln.this was passed through sieve no.22 and dried in hot air oven for 1 hr in 37°C.Dried granules were added with magnesuim sterate and talc and compressed into tablets and evaluated for its properties.

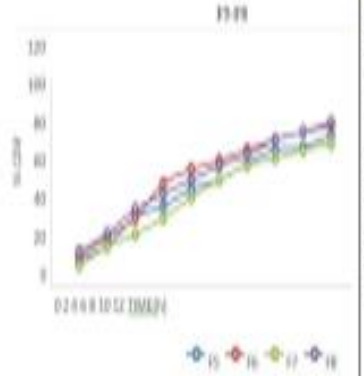
TABLE AND GRAPHS:

Ingredients	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
Curcumin	20	20	20	20	20	20	20	20	20	20	20	20
HPMC K15M	80	100	120	-	-	-	-	-	-	-	-	-
Pectin	-	-	-	80	100	120	-	-	-	-	-	-
Xanthan gum	-	-	-	-	-	-	80	100	120	-	-	-
Guar gum	-	-	-	-	-	-	-	-	-	80	100	120
Lactose	80	75	65	80	75	65	80	75	65	80	75	65
Starch paste	q	q	q	q	q	q	q	q	q	q	q	q
Magnesium sterate	2	2	2	2	2	2	2	2	2	2	2	2
Talc	4	4	4	4	4	4	4	4	4	4	4	4
SLS	1	1	1	1	1	1	1	1	1	1	1	1



FTIR OF API

FTIR of API & excipients



DISCUSSION:

The study was concerned with the development of sustained release matrix tablet of curcumin for the treatment of colon cancer.the absorbance of curcumin was found to be 421 nm .FTIR also showed no chemical interaction with pectin ,xanthan gum,guar gum & HPMC as polymer .physicochemical properties comprising of hardness (5.3 ± 0.17 to 5.8 ± 0), (0.29 ± 0.14% to 0.45 ±0.07%), weight variation(782±23.45 to 772.23±27.24), uniformity of drug (99.85 to 93.42),In vitro dissolution test was determined .Stability test was also performed for F6 and showed no major change in physicochemical parameters and drug release profile at 40±2°C/75±5% RH after 30 days and 90 days.

CONCLUSION :

From the discussion above we were able to understand that different formulations were made based on variations in concentration of polymers(HPMC,Xanthan gum,Guar gum,Pectin)and wee evaluated for its micometric ,physicochemical,in vitro properties and even stability est was also carried on . F6 formulation sustained the drug release for longer period of time over 12 h when compare to other formulation. So F6 was selected as the best formulation

BIBLIOGRAPHY :

1.Elias EJ, Anil S, Ahmad S, Daud A. Colon targeted curcumin delivery using guar gum. Natural product communications. 2010 Jun;5(6)

2.SG H, Suresh S, Asadulla S. formulation and evaluation of colon specific drug delivery systems of selected anti-inflammatory agent.

3. Vajpayee A, Fartyal S, Singh AP, Jha SK. Formulation and evaluation of colon targeted curcumin microspheres using natural polymers. Journal of Pharmaceutical Research and Opinion. 2011;1(4):108-12.

Design and In vitro evaluation of Ganciclovir novel buccoadhesive tablet

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71st Indian Pharmaceutical Congress- Chennai

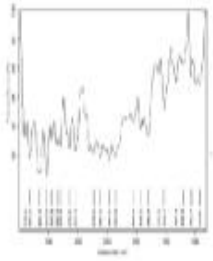
Abstract

In the present study an attempt was made to formulate and evaluate buccoadhesive sustained release tablets for buccal drug delivery of Ganciclovir in order to overcome bioavailability related problems, to reduce dose dependent side effects and frequency of administration. Mucoadhesive buccal tablets were prepared by using Carbopol, HPMC K15M, chitosan and guar gum as mucoadhesive polymer in a different concentration by direct compression method. Ethyl cellulose was used as backing membrane to provide unidirectional drug release.

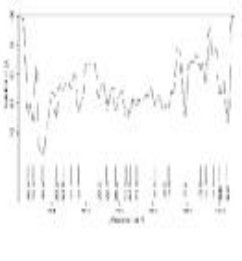
Introduction

Mucoadhesion is known to increase the intimacy and duration of contact between drug containing polymer and a mucous surface which can increase the residence time of the drug in the body. The bioavailability of the drug is improved Increased residence time and adhesion may lead to lower API concentrations and lower administering all dosage form, oral route is more preferred to patient.

Transmucosal routes of drug delivery offer distinct advantages over per oral administration for systemic drug delivery frequency to achieve the desired therapeutic outcome..



FT-IR Spectrum of pure drug Ganciclovir



FT-IR Spectrum of Ganciclovir All polymers

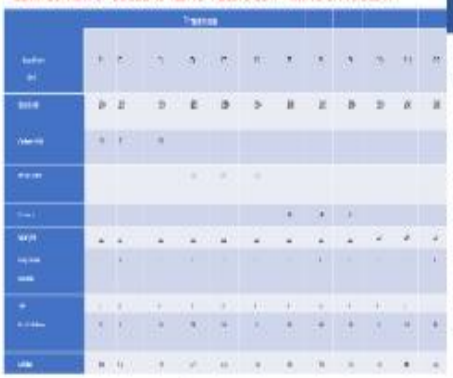
Methods and Materials

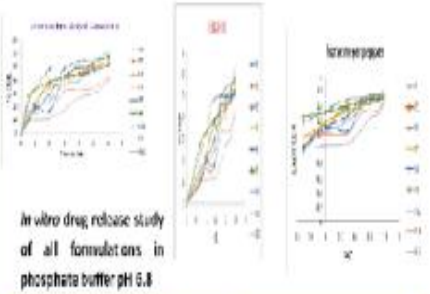
Direct compression method of All the ingredients including drug, polymer and excipients were weighed accurately . Then all the ingredients except lubricants were mixed in the order of ascending weights and blended for 10 min by triturating in a glass mortar & pestle. After uniform mixing of ingredients, lubricant was added and again mixed for 2 min. Final lubricated blend equivalent to 290mg was compressed in to tablets using 4 mm round flat punches on 10-station (Rimek). Upper punch was raised and the backing layer of ethyl cellulose was placed on the above compact. Then 2 layers were compressed into a mucoadhesive bilayer tablet with a total weight of 300 mg/tablet

Results

The results of the preformulation studies are bulk density and tapped density for core granules were found to be 0.36 to 0.40 g/cc and 0.43to 0.48g/cc respectively. Hausner's ratio values were found in the range of 1.2 to 1.18 indicates good/free flow. The Carr's index values found in the range of 13.33 to 19.56 % which indicate that powder formulation have fair flow properties and powder bed is compressible. The angle of repose was found in the range of 23° 25° indicating excellent flow property of the powder.

COMPOSITION OF BUCCOADHESIVE TABLETS CONTAINING GANCICLOVIR





In vitro drug release study of all formulations in phosphate buffer pH 6.8

Discussion

The formulation F10, F11& F12 containing guar gum showed maximum swelling within two hrs because in cold or hot water guar gum disperses and swells almost immediately to form a highly viscous thixotropic solution. The stability studies for best formulations were carried out as per procedure in methodology section 4. The results of the stability are given in the following table 43 and 44.There was no change in colour and shape. There were no significant changes in drug content and %CDR. Two months of stability studies revealed that , there was no any significant degradation of the drug

Conclusions

Ganciclovir was formulated as buccal tablets employing HPMC K15M, chitosan, guar gum and Carbopol 934 as mucoadhesive polymers in different ratios by direct compression method. The buccoadhesive tablets formulation (F10) was showing better result 61.47% drug release compared to other formulation and is thus optimized. It can be concluded that the mucoadhesive buccal tablets of Ganciclovir can be prepared by using different polymers to increase its absorption through buccal mucosa and finally to increase the bioavailability.

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References

71st Indian Pharmaceutical Congress

Theme: Healthcare System - Role of Regulators

Chennai, Tamil Nadu.

Certificate of Participation

This is to certify that ~~Prof. / Dr. / Mr.~~ / Ms. MANJULA K.S

of R R COLLEGE OF PHARMACY *has presented in the Scientific session of 71st Indian Pharmaceutical Congress 2019 held at Sri Ramachandra Institute of Higher Education and Research (DU) during 20th to 22nd December 2019, Chennai, Tamil Nadu.*

This Certificate has 12 Credit points

Shri. Ravi Uday Bhaskar	Dr. P.V. Vijayaraghavan	Dr. M. Dhilip Kumar	Prof. K.P.R. Chowdary
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FORMULATION AND EVALUATION OF PIOGLITAZONE ETHASOMES FOR DIABETICS

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Abstract

The main aim of the present investigation was to evaluate transdermal potential of novel vesicular carrier – ethosomes bearing anti-diabetic drug Pioglitazone. The ethosomes of Pioglitazone was prepared by cold method and evaluated for vesicular size, shape, entrapment efficiency and *in-vitro* drug release. Total five formulation (F1-F5) of ethosomes was prepared with different concentration of phospholipid (0.5, 1, 1.5,2, 2.5 % w/w). They were evaluated for vesicular shape, size, entrapment efficiency and *in-vitro* studies. The formulation F1 and phospholipid (2 % w/w) was selected as the best formulation due to its optimum shape, entrapment efficiency, and maximum *in vitro* release. It was further incorporated into gel using carbopol 934 (1, 1.5, 2 % w/w) as a base. The stability studies was performed on F1 formulation at temperature of 40° ± 2°C and 75±5%RH for the period of 8 weeks shows the satisfactory results. Finally, the current study can be concluded that ethosomes were a promising candidate for transdermal delivery of Pioglitazone. The results showed the potential of ethosomes of being a safe and very efficient drug carrier for systemic as well as topical delivery of drug.

Introduction

Diabetes mellitus is a heterogeneous group of metabolic disorder characterized by chronic hyperglycemia. Thiazolidinediones, also known as glitazones, are a group of oral anti-diabetic drugs designed to treat patients with type 2 diabetes. By reducing the body's resistance to insulin, the hormone is allowed to work more effectively at improving blood glucose control. TZDs work by targeting the PPAR-gamma receptor.

Methods and Materials

METHODOLOGY

Preformulation studies: The preformulation studies done by FT-IR,Solubility studies(methanol), melting point 183-184°c

FORMULATION AND DEVELOPMENT OF PIOGLITAZONE ETHOSOMAL GEL

The ethosomal vesicle showing the highest release profile (F1) was further incorporated in to carbopol gel. The specified amount of carbopol (1%, 1.5% and 2% w/w) was added in minimum amount of distilled water and soaked overnight. The ethosomal preparation was added to the swollen polymer with continuous stirring at 700 rpm in a closed vessel. The mixing was continued until homogenous ethosomal gels were obtained. The temperature was maintained at 30°C throughout the preparation. The pH was then adjusted to neutral by using triethanolamine.

Table 1. FORMULATION CHART FOR PIOGLITAZONE ETHOSOMES

INGREDIENTS	F1	F2	F3	F4	F5
Drug (mg)	8	8	8	8	8
Soyalecithin	2	2	1	1	0.5
Ethanol	30	15	30	15	30
Propylene glycol	7.5	7.5	7.5	7.5	7.5
Chosterol	0.006	0.006	0.006	0.006	0.006
Water	Qs	Qs	Qs	Qs	Qs

Results

Preformulation studies were performed by FTIR, solubility (soluble in phosphate buffer 7.4), melting point(183°c), %entrapment efficiency, scanning electron microscopy of the formulation (F1), optical microscopy(F1), *in-vitro* drug release studies, drug release kinetics, stability studies around 12 weeks of stability studies revealed that there was no change in visual appearance. Formulation F1 has showed slight changes in pH which was in acceptable limits ±0.5. Study of the drug content, in vitro release and pH revealed that there were no definite changes observed that justify drug degradation.

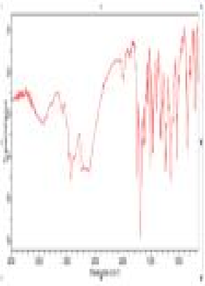

Figure 1. *FT-IR* of pure drug Pioglitazone.

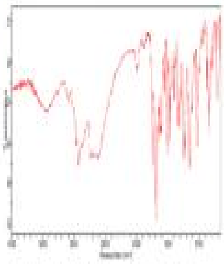

Figure 2. FT-IR of drug with soyalecithin.

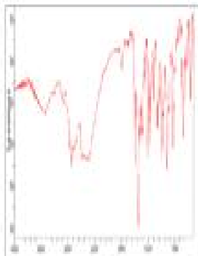

Figure 3. *FT-IR* of drug with carbopol

Figure 4. SEM OF FORMULATION (F1) .

Figure 5. Optical Microscopy F1 .

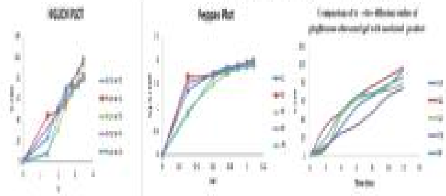

Figure 3. Drug release kinetics.

FORMULATION	KINETIC DRUG RELEASE		MECHANISM OF RELEASE		
	Zero order	First order	Higuchi	Korsmeyer Peppas	
	r^2	r^2	r^2	r^2	N
F1	0.944	0.10	0.982	0.771	0.448
F2	0.852	0.865	0.971	0.688	0.573
F3	0.934	0.009	0.864	0.940	0.239
F4	0.954	0.10	0.988	0.770	0.506
F5	0.894	0.928	0.889	0.904	0.241

Chart 1. Kinetic model for ethosomal formulation

Discussion

A successful attempt was made to formulation and evaluation of pioglitazone ethosomal gel were successfully carried out and by the reproducible experiments, it can be concluded that, Carbopol 934 was used as a gelling agent in different ratio to prepare gel and effect of it was studied for better concentration. Preformulation studies were performed by FTIR, solubility (soluble in phosphate buffer 7.4), melting point(183°c), %entrapment efficiency, scanning electron microscopy of the formulation (F1), optical microscopy(F1), *in-vitro* drug release studies, drug release kinetics, stability studies around 12 weeks of stability studies revealed that there was no change in visual appearance. Formulation F1 has showed slight changes in pH which was in acceptable limits ±0.5. Study of the drug content, in vitro release and pH revealed that there were no definite changes observed that justify drug degradation.

Conclusions

In present work the study of formulation and evaluation of pioglitazone ethosomal gel were successfully carried out and by the reproducible experiments, it can be concluded that, Carbopol 934 was used as a gelling agent in different ratio to prepare gel and effect of it was studied for better concentration. The best fit model was found to be Higuchi model for all the formulations and followed fickian release. pH, drug content was found to be in the range of ([illegible]-7.34), ([illegible]-7.30). Marketed product was compared with the gel prepared. The results of the stability study showed that there was no significant change.

Contact

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References

71st Indian Pharmaceutical Congress

Theme: Healthcare System - Role of Regulators

Chennai, Tamil Nadu.

Certificate of Participation

This is to certify that Prof. /Dr. /Mr. /Mrs. ROSHAN M JAIN

of R.R COLLEGE OF PHARMACY, BANGALORE has presented in the Scientific session of 71st Indian Pharmaceutical Congress 2019 held at Sri Ramachandra Institute of Higher Education and Research (DU) during 20th to 22nd December 2019, Chennai, Tamil Nadu.

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FORMULATION AND EVALUATION OF MICROBALOONS OF ASPIRIN AND FAMOTIDINE

Akhila Lakshmi .N*[1], A Geethalakshmi[1], Sujatha P Muchalambe , MD.Iftekhar alam [1],Srilatha .K.S

71st Indian Pharmaceutical Congress- Chennai

Abstract

The present study was an attempt to develop Microballoons of aspirin and famotidine to prolong gastric residence time in stomach& to control drug release for longer period of time.Aspirin used the treatment of inflammation and Famotidine used to control acidity were formulated as microballoons using biocompatible polymers like ethylcellulose ,HPMC4KM in different ratio using DMF&DCF as evaporating solvent in Emulsion solvent evaporation technique. Various processing and formulation parameters such as drug/polymer ratio, stirring speed, volume of processing medium,physicochemical ,micrometric parameter stability test were carried out.It showed extended release upto 8 hrs

Introduction

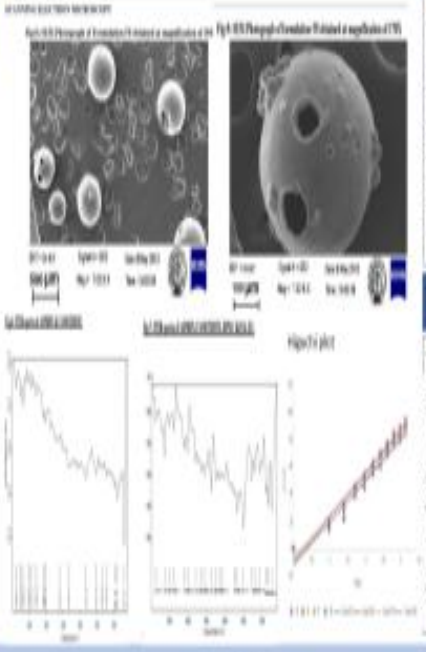
The oral sustained-controlled release formulations was developed to release the drug slowly into GIT & maintain an effective drug concentration for longer period of time Microballoons are hollow microspheres with spherical empty particles without core, free flowing powders consisting of proteins or synthetic polymers, ideally having a size <200 µm

Ingredients	F1	F2	F3	F4	F5	F6	F7	F8
Aspirin(mg)	300	300	300	300	300	300	300	300
Famotidine(mg)	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
HPMC K4M(mg)	-	-	-	100	200	300	100	150
Ethylcellulose(mg)	100	200	300	-	-	-	100	150
Dimethylformamide (ml)	10	10	10	10	10	10	10	10
Dicholoromethane(ml)	10	10	10	10	10	10	10	10
Tween 80(ml)	10	10	10	10	10	10	10	10

Methods and Materials

Microballoons containing aspirin and famotidine as a core material were prepared by emulsion solvent evaporation method.Different ratio of polymers (Ethylcellulose and HPMC K4M) were dissolved in mixture of dimethylformamide & dicholomethane (1:1) at room temperature. This was poured into 250 ml water containing 0.02% Tween 80 maintained at a temperature of 30-40° C and subsequently stirred at ranging agitation speed for 20 min to allow the volatile solvent to evaporate. The microsphere formed were filtered, washed with water and dried in vacuum.

Results



Discussion

Aspirin is cyclooxygenase inhibitor having bioavailability 80-100% & half life 2-3 hrs that acts on both prostaglandins COX-1 and COX-2. When aspirin and famotidine microballoons were prepared with biocompatible polymers like ethyl cellulose &HPMCX4M using DMF & DCM as solvents .The prepared formulation were characterized for their % yield(93.75) ,micrometric properties(25°94'±1.1682 good flow property)hence can be easily packed into capsule dosage form ,particle size(448.61), buoyancy studies(75.00±0.23),drug entrapment(84.80±1.90),invitro drug release studies(, 61.66 ± 0.16 to 82.66 ± 1.99) stability studies for 60 days(90.313 % for 45 ± 2°C and 75 ± 5 % RH.). Thus the prepared microballoons proved to be a potential candidate as microparticulate controlled release drug delivery device

Conclusions

The study was achieved to retard release of drug at its absorption site by prolonging residence time of drug &controling release for longer period of time.Various formulations of microballoons of aspirin& famotidine were prepared by emulsion solvent evaporation technique using biocompatible polymers showing better anti-inflammatory, anti ulcer activity & increased GRT. Thus it was concluded that F8 gae effective release in 10hrs .

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References

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71st Indian Pharmaceutical Congress

Theme: Healthcare System - Role of Regulators

Chennai, Tamil Nadu.

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DESIGN AND CHARACTERIZATION OF COLON SPECIFIC MATRIX TABLET OF A NSAID BY USING NATURAL POLYMER

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DR-03

ABSTRACT

The objective of the present study was to formulate and evaluate sustained release matrix tablets of Ketoprofen which widely used as non-steroidal anti-inflammatory, analgesic and in the treatment of rheumatoid arthritis. Matrix tablets comprising of sustained release (ketoprofen) were formulated. Formulations with three different types of newly synthesized polymers and one grade of ethyl cellulose in several drug-to-polymer ratios were compressed into tablets using the direct compression method.

INTRODUCTION:

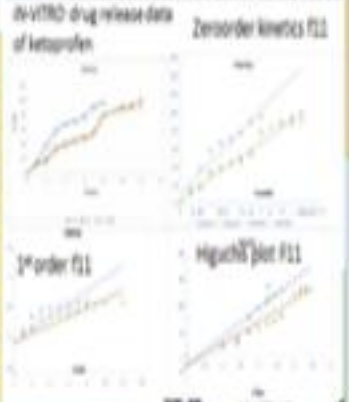
Sustained release dosage forms are designed to complement the pharmaceutical activity of the medicament in order to achieve better selectivity and longer duration of action. Sustained release preparations are helpful to reduce the dosage frequency and side effects of drugs and improve patient's convenience. Sustained release matrix tablets is relatively easy to fabricate by incorporating drug molecules in slowly disintegrating or inert porous materials. Oral delivery of drug to the colon is valuable in the treatment of diseases of colon such as colon cancer ,ulcerative colitis, crohn's diseases and inflammatory bowel disease.

METHODOLOGY:

Method of preparation sustained release matrix tablets:

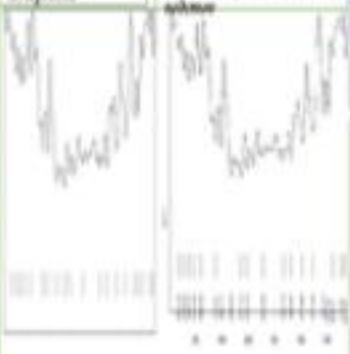
In the sustained release matrix tablets, ketoprofen is used as active ingredient along with the Three different types of natural polymer like(xanthan gum, guar gum, chitosan) and one Grade of ethyl cellulose ether derivative in several drug to polymer ratio is used, Lactose as Diluent . All the above mentioned ingredients were mixed properly then talc was added as a Glidant and magnesium stearate was as a lubricant. All the above mixture were mixed Properly with mortar and pestle for about 15 minutes. they were compressed into tablets by Using direct compression method and examined their physical properties and appearance.

Formulation of ketoprofen



FT-IR spectrum of ketoprofen

FT-IR spectrum of ketoprofen and mix of all polymer



DISCUSSION

The study is concerned with the development of matrix tablets of ketoprofen for Sustained release with different grades of polymer like(xanthan,guar gum,chitosan).The absorbance of drug was found to be 260nm FTIR spectra of pure drug and drug-polymer mixture revealed no chemical interaction. physicochemical parameters like thickness(4.9 ± 0.1mm to 5.1 ± 0.1 mm), hardness(5.3 ± 0.17 to 5.8 ± 0), friability(0.20 ± 0.14% to 0.45 ±0.07%), weight variation(782±23.45 to 772.23±27.24), uniformity of drug (99.85 to 93.42) studies were evaluated. In vitro dissolution studies were also performed for the drug release study. Stability study of F11 formulation was performed and showed no major change in physicochemical parameters and drug release profile at 40±2°C/75±5% RH after 30 days and 90 days.

CONCLUSION :

Various formulations were developed by using release rate controlling polymer like (GUAR, XANTHAN GUM, CHITOSAN) by direct compression method . different proportion of polymer was associated with decrease in the cumulative drug release rate. Thus, we conclude that form among all the developed formulations, F11 formulation sustained the drug release for longer period of time over 12 h when compare to other formulation. So F11 was selected as the best formulation. From the result, guar gum, xanthan gum and chitosan retards the release rate of drug and the tablet made by using polymer can be used as sustained release.

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2. Bisal PK, Kumar A, Bhadoriya AS. Design and evolution of colon specific drug system. IJPCBS. 2013;3:1:150-167.

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ONE DAY NATIONAL SEMINAR ON

DRUG DELIVERY IN PHARMACEUTICAL TRANSLATIONAL RESEARCH

CERTIFICATE

OF PARTICIPATION

This certificate is presented to **Dr/Mr/Miss/Mrs.** Akhila Lakshmi N of R R College Of Pharmacy for active participation in **e-Poster Presentation** for the Topic Entitled Design and Characterization of Colon Specific Matrix Tablet of NSAID by Natural Polymer Co-authored with A Geetha Lakshmi, K S Srilatha, Krishna Manmohan Sah during the conduct of one day national seminar on "**Drug Delivery in Pharmaceutical Translational Research**" held on 23rd November 2019, sponsored by Rajiv Gandhi University of Health Sciences [RGUHS] & Association of Pharmaceutical Teachers of India [APTI], Bengaluru.

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FORMULATION AND EVALUATION OF MUCOADHESIVE BUCCAL PATCHES CONTAINING ATORVASTATIN

DR -09

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ABSTRACT

Buccoadhesive patches for delivery of Atorvastatin were prepared. The present study was to formulate and evaluate the buccal films using polyvinyl pyrrolidone(PVP), Ethyl Cellulose(EC) and hydroxyl propyl methyl cellulose(HPMC) as polymers and propylene glycol or polyethylene glycol 400 as plasticizers by using solvent casting technique. The physicochemical compatibility of the drug and polymers were studied by FTIR Spectroscopy. The patches were further subjected to various physical evaluation along with the invitro permeation studies using sheep buccal mucosa.

INTRODUCTION:

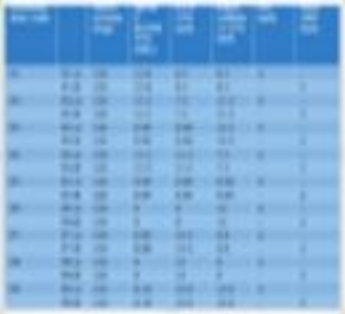
Buccal delivery of drugs provides an alternative to the oral route of drug administration, particularly in overcoming deficiencies associated with the latter mode of administration. Problems such as high first-pass metabolism and drug degradation in the harsh gastrointestinal environment can be circumvented by administering the drug via the buccal route.

METHODOLOGY:

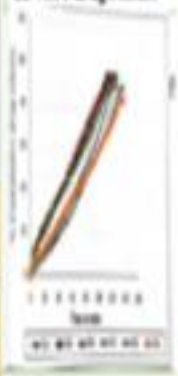
MATERIAL AND METHODOLOGY

Preformulation studies such as melting point determination, solubility and compatibility studies were performed and patches were prepared by solvent casting method.

Formulation chart



In-vitro drug release



Swelling studies

FT-IR spectrum of Drug-HPMC-PVP-EC

FT-IR spectra of pure drug

DISCUSSION

The Preformulation studies such as melting point, solubility, and absorbance maxima confirms the drug is pure not degraded. The compatibility between drug and polymer were studied by FTIR studies and shows no significant interaction between them. Among all the formulations, formulation containing F8B with PEG400 as a plasticizer showed better drug release of 97.10±0.71 at 150 mins. By reviewing the results obtained, in vitro characterization it was concluded that Atorvastatin can be administered as buccal dosage form. Buccal patches consisting of the polymers HPMC:PVP:EC with PEG 400 as plasticizer for controlled release of the drug for 150 mins.

CONCLUSION:

The buccal patches of (18 formulations) with different proportions of different polymers were successfully formulated.

F8B is having greater % drug release. Formulation F3A having less drug release capacity than other formulations.

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This certificate is presented to Dr/Mr/Miss/Mrs. Rupesh Kumar Sah of RR College of Pharmacy for active participation in **e-Poster Presentation** for the Topic Entitled Formulation and Characterization of Nanoparticles of a Model Anti-Hypertensive Drug Co-authored with Dr. A. Geethalakshmi during the conduct of one day national seminar on "**Drug Delivery in Pharmaceutical Translational Research**" held on 23rd November 2019, sponsored by Rajiv Gandhi University of Health Sciences [RGUHS] & Association of Pharmaceutical Teachers of India [APTI], Bengaluru.

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FORMULATION AND EVALUATION OF FAST DISPERSIBLE TABLETS OF CEFADROXIL WITH SUPERDISINTEGRANTS OF NATURAL AND SYNTHETIC POLYMER

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DR-01

ABSTRACT

Fast dispersible tablets are emerging as one of the most popular and widely accepted dosage forms because it disintegrate within few minutes. In the present work attempts were made to prepare fast dispersible tablets (FDT) of antibacterial antibiotic, Cefadroxil by direct compression method with synthetic and natural superdisintegrants (*Plantago ovata, Fenugreek* mucilage) Compare to *Plantago ovata* mucilage showed the highest release (97%) within 3 minutes.

INTRODUCTION: Oral routes of drug administration have wide acceptance up to 50-60% of total dosage forms. The most popular solid dosage forms are being tablets and capsules; one important drawback of this dosage forms for some patients, is the difficulty to swallow. Drinking water plays an important role in the swallowing of oral dosage forms. Fast dispersible tablets are designed to disintegrate quickly in the mouth or disperse in a spoonful of water to become a suspension.

METRIALS AND METHODOLOGY

PREFORMULATION STUDIES: Solubility studies, MP determination, Drug – Excipient compatability studies.

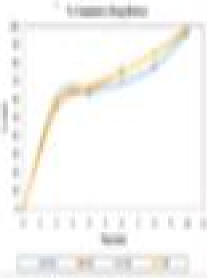
PREPARATION OF FAST DISPERSIBLE TABLET: Fast Dispersible tablets of Cefadroxil were prepared using direct compression method in by incorporating superdisintegrants

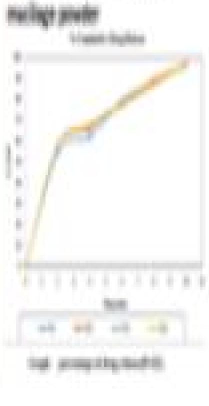
Formulation chart of Cefadroxil fast dispersible tablets

S.NO	Ingredients (mg)	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
[illegible]	Cefadroxil	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	MCC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Mg. Stearate	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Sodium starch glycolate	-	-	-	-	-	-	10	20	22.5	-	-	-
[illegible]	Crospovidone	-	-	-	-	-	-	-	-	-	10	20	22.5
[illegible]	Plantago ovata seed powder	10	20	22.5	-	-	-	-	-	-	-	-	-
[illegible]	Fenugreek seed powder	-	-	-	10	20	22.5	-	-	-	-	-	-

FTIR spectra of Fenugreek

FTIR spectra of Plantago ovata mucilage powder





DISCUSSION: The results of the evaluation parameters demonstrate that it is possible to design and develop Fast Disintegrating tablets of Cefadroxil by using different natural and synthetic superdisintegrants. Among the superdisintegrants used natural superdisintegrants i.e. plantago ovata showed better disintegration time and dissolution profile compared to other superdisintegrants.

CONCLUSION: The development of dispersible tablets for oral administration of Cefadroxil by direct compression method using various super disintegrating agents of natural origin that disperse in oral cavity up to 20 seconds with or without the drinking water, had a pleasant mouth feel and improved patient compliance, particularly for those who have difficulty in swallowing (such as pediatric and geriatric patient). Formulation F3 containing plantago ovata with appropriate amount of other excipients was considered to be the optimized formulation with desired drug release (97%) within 3 minutes. Dispersible tablet shows all parameter like hardness3.5±0.2, friability0.43±0.67, disintegration time 30±0.7sed , dispersion 31±0.33 time, thickness 3.59±0.02. The stability study results shows that no significant changes in that parameters.

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CERTIFICATE

OF PARTICIPATION

This certificate is presented to **Dr/Mr/Miss/Mrs.** Akash Kumar Baurijar of R R College Of Pharmacy for active participation in **e-Poster Presentation** for the Topic Entitled Formulation & Evaluation of fast Dissolving Tablets of Cefadroxil with superdisintegrant of Natural & Synthetic origin Co-authored with A Geethalakshmi, during the conduct of one day national seminar on "**Drug Delivery in Pharmaceutical Translational Research**" held on 23rd November 2019, sponsored by Rajiv Gandhi University of Health Sciences [RGUHS] & Association of Pharmaceutical Teachers of India [APTI], Bengaluru.

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STUDY OF MUCOADHESIVE EFFECT OF MORINGA OLIFERA GUM ON GASTRO RETENTIVE TABLETS OF BACLOFEN

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DR -06

ABSTRACT

The objective of the study is to study the mucoadhesive effect of natural gum obtained from Moringa oleifera as tablet mucoadhesive polymer. This property of the gum was evaluated and compared with standard synthetic polymers like PVP K30, HPMCK4M for mucoadhesion. In this current study Baclofen is used as a model drug.

INTRODUCTION:

Drugs that are easily absorbed from gastrointestinal tract (GIT) and have short half-lives are eliminated quickly from the systemic circulation. Frequent dosing of these drugs is required to achieve suitable therapeutic activity.

To avoid this limitation, the development of oral sustained release formulations is an attempt to release the drug slowly into the gastrointestinal tract (GIT) and maintain an effective drug concentration in the systemic circulation for a long time. After oral administration, such a drug delivery would be retained in the stomach and release the drug in a controlled manner, so that the drug could be supplied continuously to its absorption sites in the gastrointestinal tract (GIT).

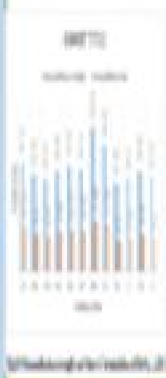
METHODOLOGY:

Method of preparation of gastro mucoadhesive tablets:

The Baclofen mucoadhesive tablet of 100mg are prepared by wet granulation method by using synthetic polymer HPMC K4M, PVP K30, and Moringa gum as a natural polymer. MCC is used as a diluent and binding agent. Magnesium stearate is used as glidant, talc are used as lubricant. The weighed quantity of drug, polymer are added to mortar and wetting agent are added to prepare a damp mass, the damp mass was passed through sieve 10.The wetted granules was dried at 50c for 30 min in hot air oven the dried granules were passed through the sieve 40 the resulted granules are uniformly mixed with the lubricant and glidant for 5min.The granules of each formulation was compressed by using flat punch at a speed of 20 rpm on tablet punching machine.

Composition of Baclofen gastro mucoadhesive tablets (in mg/tablet)

S.NO	INGREDIENT	FORMULATION			
		A1	A2	A3	A4
1	Baclofen	[illegible]	[illegible]	[illegible]	[illegible]
2	HPMC K4M	[illegible]	[illegible]	[illegible]	[illegible]
3	PVP K30	-	[illegible]	[illegible]	[illegible]
4	MCC	[illegible]	[illegible]	[illegible]	[illegible]
5	Talc	[illegible]	[illegible]	[illegible]	[illegible]
6	Magnesium stearate	[illegible]	[illegible]	[illegible]	[illegible]
	Total	[illegible]	[illegible]	[illegible]	[illegible]



FTIR spectra of Baclofen

FTIR spectra of Baclofen +Moringa+HPMCK4M+PVP K30

DISCUSSION

A successful attempt was made to formulate mucoadhesive effect of moringa olifera gum on gastro retentive tablets of baclofen . The mucoadhesion of prepared tablets was increased with optimum degree of swelling increased. The bioadhesive strength of the tablets was found to be a function of nature and concentration of polymer. Maximum mucoadhesion was seen with the tablet containing Moringa. Mucoadhesive strength increases with increasing the Moringa gum, the appropriate ratio of HPMCK4M and Moringa shows good mucoadhesive property. The formulated mucoadhesive effect of moringa olifera gum were characterised for various physicochemical parameters.

CONCLUSION

Gastro mucoadhesive tablets of Baclofen could be prepared using Moringa gum, HPMCK4M, PVPK30 by wet granulation method. All the formulations showed mucoadhesive strength of 21.01±1.05 to 34.67±1.16 gm with high force of adhesion. The mucoadhesive strength was decreased by increasing the concentration of PVPK30 in Batch C, In Batch B increases by increasing the ratio of Moringa, where in Batch A mucoadhesion increases with increase in ratio of HPMCK4M. Formulation containing Moringa gum in (BatchB3) showed maximum % swelling index of 87.39% in 8 hrs.

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This certificate is presented to **Dr/Mr/Miss/Mrs.** Karthik Kandagal of R.R. College Of Pharmacy for active participation in **e-Poster Presentation** for the Topic Entitled Formulation & Evaluation of mucoadesive buccal patch containing Atrovastatin Co-authored with A.Geethalakshmi, M.Padmasree, & Parthasarthy. during the conduct of one day national seminar on "**Drug Delivery in Pharmaceutical Translational Research**" held on 23rd November 2019, sponsored by Rajiv Gandhi University of Health Sciences [RGUHS] & Association of Pharmaceutical Teachers of India [APTI], Bengaluru.

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FORMULATION AND EVALUATION OF MUCOADHESIVE BUCCAL PATCHES CONTAINING CAPTOPRIL

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DR-02

ABSTRACT

The aim of this research work is to design and evaluate the mucoadhesive buccal patches containing captopril by using different mucoadhesive polymer like HPMC, PVP, EC by solvent casting method .This formulation is done to achieve the goal to increase the bioavailability, reduce dosing frequency and to improve patient compliance. The captopril is sulfhydryl- containing angiotensin-converting enzyme inhibitor which is used in the management of hyper tension ,heart failure and myocardial infarction.

INTRODUCTION:

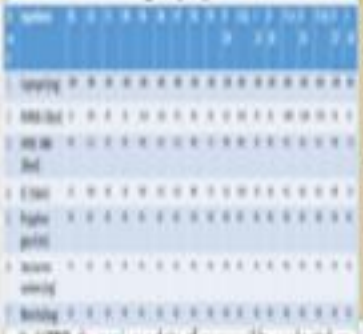
Mucoadhesive drug delivery system are delivery system, which utilized the property of bio adhesion of certain polymers, which because adhesive on hydration and hence can be used for targeting a drug to particular region of the body for extended period of time. The ability to maintain a delivery system at a particular location for an extended period of time has great appeal for both local as well as systemic drug bioavailability

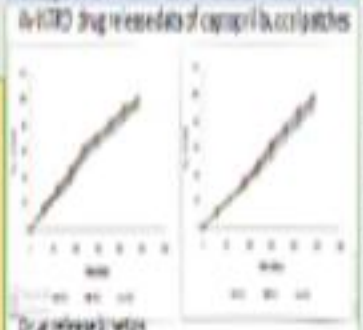
A drug can be easily applied and localized to the application site and can be removed from there if necessary

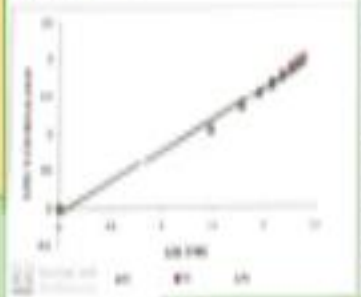
METHODOLOGY:

Preparation of captopril buccal patch. Accurately weighed quantities of EC and PVP was dissolved in ethanol separately in two beakers and HPMC was first dissolved in 50% water and then in 50% ethanol allowed for some time for swelling of polymer, amount of drug to be calculated such that 2"5cm diameter of petri plate must contain drug and added to the polymer solution and stirred well using magnetic stirrer and propylene glycol was added gradually with continuous stirring then 30 ml resultant mixture was poured into each petri dish. Drying was carried out at 40°C for 24 hrs in hot air oven. Similarly, patches were also prepared using glycerine as plasticizer by solvent casting technique

Composition of mucoadhesive buccal patches containing captopril







DISCUSSION

A successful attempt was made to formulate mucoadhesive buccal patches containing captopril using mucoadhesive polymer like HPMC, PVP, EC by solving tooling method. The prepared patches were evaluated based on their physical characteristics like weight uniformity, patch thickness, percentage swelling , surface pH, folding endurance and in-vitro mucoadhesion time ,and they were evaluated for drug content uniformity ,in-vitro drug release study and in-vitro permeation study. The stability study was conducted as per ICH guidelines for 3 months

CONCLUSION : In the present study, an attempt was made to formulate and evaluate mucoadhesive buccal patches of captopril. preformulation studies were performed by FTIR, pH, drug content, swelling index, mucoadhesion time, in vitro.

Drug release kinetics, the selected 5 formulation (F1,F5,F6,F11,F12,F15 were stored at 45±0.5°C in hot air oven in 3 months. All were found to be stable at 45°C with respect to the drug content and in vitro drug profile

Among various formulation F5 to F12 exhibited good mucoadhesion, folding endurance , swelling index ,the drug release as compared to other formulation.

From the above results it can be concluded that captopril can be delivered in the form of buccal patches release pattern of a drug from these patches can be altered by using different formulation variables

FT-IR spectrum of captopril

FT-IR spectrum of Captopril and mucoadhesive polymer

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FORMULATION AND EVALUATION OF FAST DISPERSIBLE TABLETS FOR ANTI DEPRESSENT DRUG

T131

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ABSTRACT:

The aim of present study was to Formulate and Evaluate Oral fast dispersible tablets of Citalopram hydrobromide. Citalopram hydrobromide is a highly selective serotonin reuptake inhibitor with minimal norepinephrine and dopamine neuronal reuptake. Tolerance to the 5-HT selective inhibitor. the study revealed that the concentration of Croscarmellose sodium between 10% showed satisfactory results.

INTRODUCTION:

Mouth dissolving tablets disintegrate or dissolve in saliva and are swallowed without water. As tablets disintegrate in mouth this could enhanced the clinical effect of drug through pre gastric absorption from the mouth, pharynx and esophagus.5 "Oro Dispersible Tablet" is defined to be replaced in mouth where it disappears rapidly before swallowing and which disintegrates in less than 3 minutes. Oro dispersible tablets are also known as "Quick dissolves", "Fast melts", "Fast dissolving", "Fast disintegrating", "Rapid dissolve", and "Orally dissolving tablets". These tablets are expected to dissolve or disintegrate in the oral cavity without drinking water.

METHODOLOGY:

Formulation of tablet:

The drug was mixed with proper portion of superdisintegrants. Care was taken to confirm the proper mixing of drug and superdisintegrants. Then the mixture is passed through sieve No 44, after addition of the other excipients. The mixture was blended with lubricating agent (magnesium stearate) and glidant. Finally the blend was subjected for compression using 10mm on Rimek mini press 10 station machines.

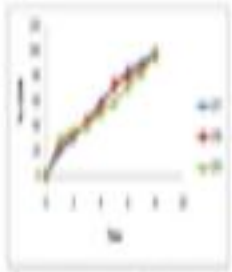
S. no	Ingredients	CP1	CP2	CP3	CP4	CP5	CP6
1.	Citalopram	10	10	10	10	10	10
2.	Crospovidone	7.5	10				
3.	Croscarmellose sodium			7.5	10		
4.	Sodium starch glycolate					7.5	
5.	povidone+ croscarmellose						5+5
6.	Aspartame	1	1	1	1	1	1
7.	Mannitol	28	28	28	28	28	28
8.	MCC	42.5	40	37.5	42.5	40	37.5
9.	Lactose	10	10	10	10	10	10
10.	Magnesium stearate	1	1	1	1	1	1

FTIR STUDIES OF DRUG

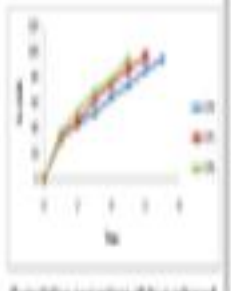
FTIR STUDIES OF DRUG+ALL

FTIR STUDIES OF DRUG+ CROSPOVIDONE

FTIR STUDIES OF DRUG+ CROSCARMELLOSE SODIUM



Cumulative percentage of drug released from the batches CP-1 to CP-3



Cumulative percentage of drug released from the batches CP-3 to CP-6

DISCUSSION:

In the preformulation study, IR Spectra of pure drug and with different polymers showed no interaction. Post- compressional parameters like Shape and Colour of Tablets, Weight Variation test, Hardness, Thickness, Friability, Drug Content, Water Absorption Ratio, Wetting Time, In vitro Dispersion Time, In vitro Dissolution Study, Stability Studies. The prepared formulations containing superdisintegrants Croscarmellose sodium, along with the mixture of mannitol and MCC showed faster dispersion and dissolution profile as compared with other two superdisintegrants formulation.

CONCLUSION:

The tablets prepared met the standard evaluation parameters with a slight deviation within the prescribed limits. The short term stability studies carried out were confirmative of the drug stability in the tablets during the present study. The disintegration and dissolution studies revealed that the tablets prepared with croscarmellose sodium shown faster disintegration as compared to tablets prepared with crospovidone and sodium starch glycolate. It is concluded that the fast disintegrating tablets of Citalopram Hydrobromide prepared with croscarmellose sodium showed better disintegration time and the dissolution profile.

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GASTRORETENTIVE SYSTEM OF FLUVASTATIN BY USING NATURAL AND SYNTHETIC POLYMER

T-128

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ABSTRACT: The present purpose of this research is to develop a sustained gastro retentive formulation by employing natural and synthetic polymer or in combination. HPMCK100 used as synthetic and hibiscus polysaccharide is used as natural. Prior to start the research the drug and excipients were studied for compatibility studies through FTIR and analysed for Precompression parameters like angle of repose, bulk density, tapped density, compressibility index and Hausner's ratio.Fluvastatin sodium based on gas forming agent were prepared and evaluated for post compression parameters.

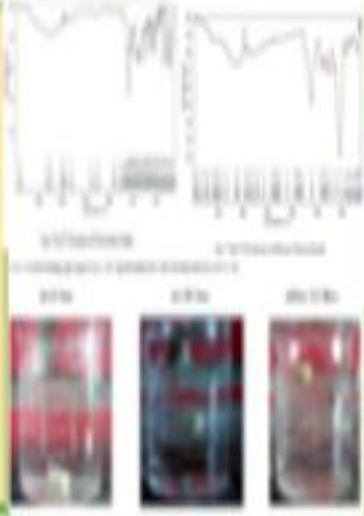
INTRODUCTION: It aims to achieve and maintain the desired drug concentration. During the last three decade many studies have been performed concerning the sustained release dosage form of drugs, which have aimed at the prolongation of gastric emptying time (GET). The GET has been reported to be from 2 to 6 hours in humans in the fed state.2 Accordingly orally sufficient bio availability and prolongation of the effective plasma level occasionally cannot be obtained. Gastro retention helps to provide better availability of new products with new therapeutic possibilities and substantial benefits for patients.

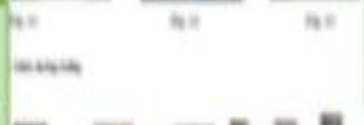
METHODOLOGY: Formulation of floating tablets:

Fluvastatin sodium tablets were prepared by direct compression method. Fluvastatin sodium, different proportions of polymers such as HPMC K100M, Hibiscus mucilage, Sodium bicarbonate, citric acid and micro crystalline cellulose was mixed well to obtain mass and the mass was passed through sieve no. 60. Other manufacturing excipients such as talc and magnesium stearate were added. The well mixed powder was compressed under 8 mm Rimex tableting machine, Mini press - I 10 station.

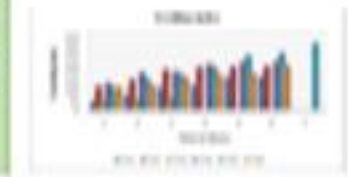
Composition of the formulations

Ingredients (mg)	F1	F2	F3	F4	F5	F6
Fluvastatin Sodium	80	80	80	80	80	80
HPMC K100 M	20	20	40	60	80	100
Hibiscus Mucilage	20	40	40	40	40	40
Sodium Bicarbonate	30	30	30	30	30	30
Citric Acid	30	30	30	30	30	30
Micro crystalline cellulose	70	50	30	10	10	10





Swelling Index Study (F2-F6)



DISCUSSION: The drug Fluvastatin sodium complied with the preliminary identification test. UV spectrum of drug found at 304.5 nm. The FTIR spectra of the drug and the physical mixture confirmed the absence of interaction between the drug and the polymeric mixtures. The bulk density & tapped density was found to be in between 0.273±0.002 to 0.302±0.016 & 0.332±0.004 to 0.434±0.022. Carr's index or compressibility index & hausner's ratio was found to be in between14.54±0.022 to 17.44±0.024 & 1.20 to 1.23 results. The angle of repose for different formulations was less than 30, which indicates good flow properties of the powder. The values were found to be in between 19.47±0.016to 26.19±0.014. F$1 182.8, F$2 206.0, F$4 228, F$6 209.2 for 6 h for F$3 47.6 for 3h and F$5 shows 316 for 7h respectively.

CONCLUSION: The present investigation was carried out to develop gastro retentive sustain release formulation drug for an effective and safe therapy by using a natural polymer and a synthetic polymer respectively i.e. Hibiscus polysaccharide and HPMCK100M.From the experiment it can be concluded that: FT IR studies indicated that the drug is compatible with the polymers. Floating sustained tablets were prepared successfully by direct compression incorporating a gas generating material, and release retardant polymers and other excipients. Tablets were found to be good without chipping, capping and sticking.The drug content was uniform in all formulations of prepared tablets.

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Formulation and Evaluation of pH triggered ocular *in situ* gelling system for Tobramycin Sulphate for conjunctivitis

1013

Lucky Gyani*[1], A. Geethalakshmi[1]

[1] Department of Pharmaceutics, R R College of Pharmacy, Bangalore-90

Aim & Objective: In the present study, an attempt was made to formulate and evaluate **Tobramycin Sulphate** ocular *in situ* by pH triggered system.

Methodology: Preformulation studies

FT-IR, Solubility (water198mg/10ml), Melting point 274°C

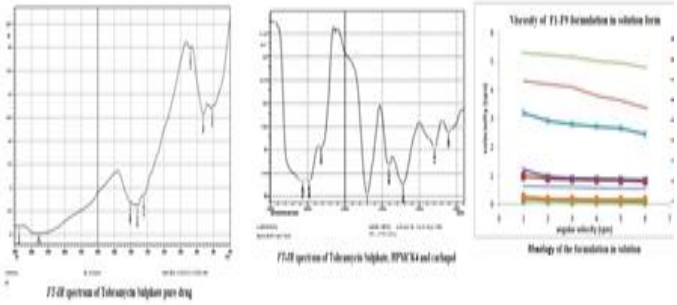
Formulation of pH triggered *in situ* gelling system

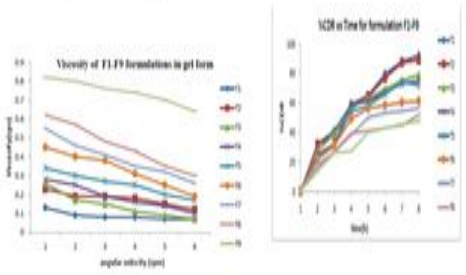
carbopol934+distilledwater+hydrateovernight+HPMC K4M+Drug+sodiumchloride+Benzalkonium chloride- clear solution-volume made by diswater.

POST FORMULATION METHODS: Appearance and clarity (Opaque), pH (6.3), Drug content(97.9), Gellingcapacity(+++), Rheological studies

Ingredients	F1	F2	F3	F4	F5	F6	F7	F8
Tobramycin Sulphate	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Carbopol934	0.2%	0.4%	0.6%	0.8 %	1%	1.2%	1.4%	1.6%
Benzalkonium chloride	0.02 %	0.02 %	0.02 %	0.02 %	0.02 %	0.02 %	0.02%	0.02 %
HPMC K4 M	0.5%	1%	1.5%	0.5%	1%	1.5%	0.5%	1%
Sodium chloride	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
Distilled water	QS	QS	QS	QS	QS	QS	QS	QS

In vitro drug diffusion studies ,Test for sterility, Isotonicity and Stability studies





Release kinetics of formulations

Formulation	Zero order	First order	Higuchi	Kosermeyer-Peppas	
	r^2	r^2	r^2	r^2	n
F6	0.853	0.180	0.961	12.1	2.57

Conlusion: Developed *in situ* gelling systems Formulation F6 attained all the necessary *in vitro* parameter required for a stable solution.

Ref: 1.Geethalahshmi A and Roopa karki. pH triggered in situ gelling system for brimonidine tartrate. *Int J Pharmagen.* 2011; 2(2): 159-164 2.Shividya B, Rita M, Cardoza P D. Sustained ophthalmic delivery of ofloxacin from at a pH triggered in situ gelling system. *J Control Rel.*

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Formulation and *In Vitro – In Vivo* Evaluation of Omeprazole *In Situ* Gelling System for Peptic Ulcer by pH Triggered Method

Mohamed Mustafa Razi*[1], A. Geethalakshmi[1]

[1] Department of Pharmaceutics, R R College of Pharmacy, Bangalore-90

Aim & Objective: In the present study, an attempt was made to formulate and evaluate Omeprazole *in situ* gel for peptic ulcer by using pH triggered method.

Methodology:

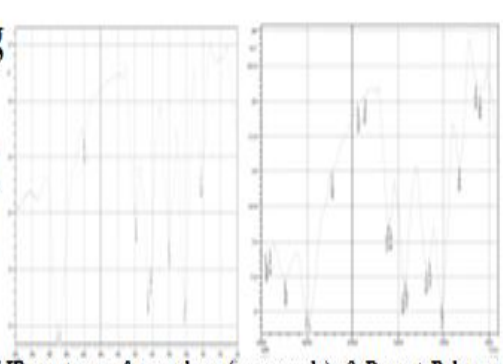
- **Preformulation studies :** FT-IR, Melting point 155°C

Formulation of pH triggered *in situ* gelling system

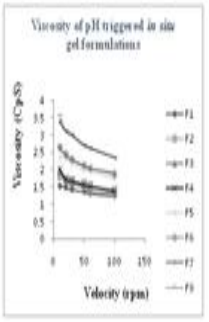
carbopol934+distilledwater+hydrateovernight+HPMCK4M+Drug+sodiumchloride+methyl paraben clear solution-volume made by diswater

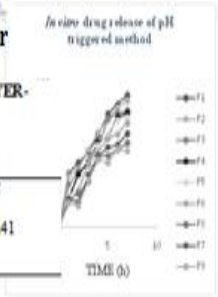
POST FORMULATION METHODS: Appearance and clarity, pH(7.1), Drug content(97.9), Gelling capacity(+++), In vitro floating lag time(31), Floating duration(12h), Rheological studies, *In vitro* drug diffusion studies, Test for sterility, Isotonicity & Stability studies

CODE	F1	F2	F3	F4	F5	F6	F7	F8	F9
Drug (mg)	40	40	40	40	40	40	40	40	40
Sodium Alginate (mg)	750	1000	1500	750	1000	1500	750	1000	1500
HPMC K100M (mg)	400	400	400	400	400	400	400	400	400
Sodium citrate(mg)	500	500	500	500	500	500	500	500	500
Calcium carbonate (mg)	500	750	1000	500	750	1000	500	750	1000
Methyl paraben(mg)	20	20	20	20	20	20	20	20	20
Sodium saccharine(mg)	5	5	5	5	5	5	5	5	5
Deionized water (ml)	100	100	100	100	100	100	100	100	100



FT IR spectrum of pure drug (omeprazole) & Drug + Polymer





FORMULATION	ZERO ORDER	FIRST ORDER	HIGUCHI	KOSERMEYER-PEPPAS	
	r^2	r^2	r^2	r^2	N
F9	0.922	0.241	0.973	8.21	2.41

Developed *in situ* gelling systems Formulation F9 attained all the necessary *in vitro* parameter required for a stable solution.

Ref: 1.Geethalahshmi A and Roopa karki. pH triggered in situ gelling system for brimonidine tartrate. *Int J Pharmagen.* 2011; 2(2): 159-164

2.Shividya B, Rita M, Cardoza P D. Sustained ophthalmic delivery of ofloxacin from at a pH triggered in situ gelling system. *J Control Rel.*

STUDY OF MUCOADHESIVE EFFECT OF MORINGA OLIFERA GUM ON GASTRO RETENTIVE TABLETS OF BACLOFEN

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DR -06

ABSTRACT

The objective of the study is to study the mucoadhesive effect of natural gum obtained from Moringa oleifera as tablet mucoadhesive polymer. This property of the gum was evaluated and compared with standard syntactic polymers like PVP K30, HPMCH4M for mucoadhesion. In this current study Baclofen is used as a model drug.

INTRODUCTION:

Drugs that are easily absorbed from gastrointestinal tract (GIT) and have short half-lives are eliminated quickly from the systemic circulation. Frequent dosing of these drugs is required to achieve suitable therapeutic activity.

To avoid this limitation, the development of oral sustained release formulations is an attempt to release the drug slowly into the gastrointestinal tract (GIT) and maintain an effective drug concentration in the systemic circulation for a long time. After oral administration, such a drug delivery would be retained in the stomach and release the drug in a controlled manner, so that the drug could be supplied continuously to its absorption sites in the gastrointestinal tract (GIT)

METHODOLOGY:

Method of preparation of gastro muccadhesive tablets:

The Baclofen mucoadhesive tablet of 100mg are prepared by wet granulation method by using synthetic polymer HPMC K4M, PVP K30, and Moringa gum as a natural polymer. MCC is used as a diluent and binding agent. Magnesium stearate is used as glident, talk are used as lubricant. The weighed quantity of drug polymer are added to mortar and wetting agent are added to prepare a damp mass, the damp mass was passed through sieve 30.The wetted granules was dried at 500c for 20 min in hot air oven ,the dryed granules were passed through the sieve 60 the resulted granules are uniformly mixed with the lubricant and glident for 3min.The granules of each formulation was compressed by using 8mm punch at a speed of 20rpm on tablet punching machine

Composition of Baclofen gastro muccadhesive tablets (in mg/tablet)

S.NO	INGREDIENT	FORMULATIONS			
		A1	A2	A3	A4
1	Baclofen	10	10	10	10
2	HPMC K4M	20	10	20	30
3	PVP K30	-	10	20	20
4	MCC	108	[illegible]	[illegible]	103
5	Talc	7.5	7.5	7.5	7.5
6	Magnesium stearate	7.5	7.5	7.5	7.5
	Total	150	150	150	150

FTIR spectra of Baclofen

FTIR spectra of Baclofen +Moringa+HPMCK4M+PVP K30

DISCUSSION

A successful attempt was made to formulate mucoadhesive effect of moringa olifera gum on gastro retentive tablets of baclofen . The mucoadhesion of prepared tablets was increased with optimum degree of swelling increased. The bioadhesive strength of the tablets was found to be a function of nature and concentration of polymer. Maximum mucoadhesion was seen with the tablet containg Moringa. Mucoadhesive strength Increases with increasing the Moringa gum, the appropriate ratio of HPMCK4M and Moringa shows good mucoadhesive property The formulated mucoadhesive effect of moringa olifera gum were characterized for various physicochemical parameters

CONCLUSION

Gastro mucoadhesive tablets of Baclofen could be prepared using Moringa gum, HPMCK4M, PVPK30 by wet granulation method. All the formulations showed mucoadhesive strength of 21.01±1.05 to 34.67±1.16 gm with high force of adhesion. The mucoadhesive strength was decreased by increasing the concentration of PVPK30 in Batch C, In Batch B increases by increasing the ratio of Moringa, where in Batch A mucoadhesion increases with increase in ratio of HPMCK4M. Formulation containing Moringa gum in (BatchB1) showed maximum % swelling index of 87.39% in 8 hrs.

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3 Subramanayam cvs, Shetty JT. Lab of phy pharma vallabah prakashan 2002:212

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a paper entitled Study of Mucoadhesive effect of Moringa Oilfera Gum on Gastro retentive tablets of Baclofen *in the*

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Principal

Coordinator

A STUDY ON IMPROVEMENT OF DISSOLUTION PROFILE OF ETODOLAC BY LIQUISOLID COMPACT TECHNIQUE

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DR-12

Abstract

The main objectives of present investigation was to enhances the dissolution rate of water insoluble drug Etodolac by using liquid compact techniques. Several liquisolid compact tablets were preapared by using carrier material such as microcrystalline. Cellulose and coating material such as silica gel in different ratios (5:1,10:1, 20:1). PEG-400 used as non-volatile water miscible liquid vehicles. Formulation F8&F9 found to be stable after performing physical and chemical parameters at suitable intervals.

INTRODUCTION

Liquisolid technique is a new and promising method that can change dissolution rate of drugs. It as been used to enhance dissolution rate of poorly water-soluble drugs. Etodolac drug is a NSAIDs, are drugs with analgesic and antipyretic effects & which have, in higher doses, anti inflammatory effects. As analgesics, NSAIDs are unusual in that they are non narcotic. The non-steroidal anti-inflammatory drug Etocolac applying licisolid compact technique. Etodolac is a NSAID with potent analgesic and anti- arthritic properties.

Methodology

General method of preparation of liquisolids:

A drug was initially dispersed non –volatile solvents PEG-400as liquid vehicles with different drug vehicles ratio & mixture of different polymers & excipients were added above liquid by mixing in mortar. & above binary mixture other remaining additives added & mix 10 to 20 min in a mortar. Final mixture compressed using tableting machine to achieve tablet hardness, final liquid granules for solubility, dissolution, flowability, compressibility. Etodolac prepared by mixing 100mg of drug MCC & silica gel & mix for 10 min. Glirdant & lubricant add then compressed by tablet punching machine.

Formulation of Etodolac different polymers

Formulation code	Etodolac Drug	PEG 400	MCC	Silica gel G	Magnesium Stearate	talc
5:1						
F1	100mg	50mg	300mg	60mg	20mg	5mg
F2	100mg	100mg	400mg	80mg	20mg	5mg
F3	100mg	150mg	500mg	100mg	20mg	5mg
20:1						
F4	100mg	50mg	375mg	37.5mg	20mg	5mg
F5	100mg	100mg	500mg	50mg	20mg	5mg
F6	100mg	150mg	625mg	62.5mg	20mg	5mg
20:1						
F7	100mg	50mg	500mg	25mg	20mg	5mg
F8	100mg	100mg	666.6mg	33.33mg	20mg	5mg
F9	100g	150mg	833.3mg	41.66mg	20mg	5mg

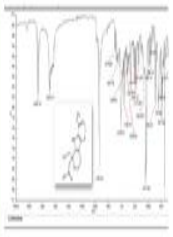

Figure FTIR spectrum of Etodolac

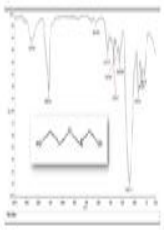

Figure 1: FTIR spectrum of Etodolac with Polyethylene Glycol (PEG-400)

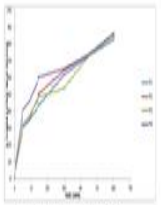

Figure Comparative in vitro drug release profile of F1-F3

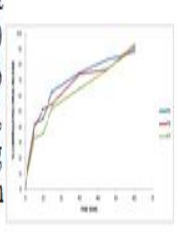

Figure Comparative in vitro drug release profile of F1-F3

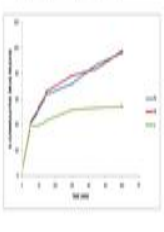

Figure Comparative in vitro drug release profile of F4-F6

DISCUSSION: In present an attempt has been made to enhance the solubility of BCS-II drug by using liquisolid compact technique. Etocolac is a white fine odcurless powder with the MP 146.5°C, soluble in ethanol methanol. FTIR spectrum obtain showed no major shift indicating chemical integrity of drug. The formulation from F1 to F9 were formulated when MCC were used as carrier and silica gel as coating material in ration such as (5:1, 10:1, 20:1).

Conclusion:

The aim of the study to increasing the solubility preformulation studies like MP, flow properties, FTIR, and in-vitro drug release of drug compact showed increase in these (F3,F6,F9) exhibited more release. The formulations of F8&F9 were selected for stability studies on the basis of their better and satisfactory evaluation parameters. In formulation showed there was not much variation in physical Parameters even after the period of 3 months. Thus, Etocolac liquisolid compact tablet enhanced dissolution rate

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a paper entitled Formulation and evaluation of Etodolac tablets. *in the*

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Principal

Coordinator

FORMULATION AND EVALUATION OF MUCOADHESIVE BUCCAL PATCHES CONTAINING CAPTOPRIL

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DR-02

ABSTRACT

The aim of this research work is to design and evaluate the mucoadhesive buccal patches containing captopril by using different mucoadhersive polymer like HPMC, PVP, EC by solvent casting method .This formulation is done to achieve the goal to increase the bioavailability, reduce dosing frequency and to improve patient compliance. The captopril is sulfhydryl- containing angiotensin-converting enzyme inhibitor which is used in the management of hyper tension ,heart failure and myocardial infraction.

INTRODUCTION:

Mucoadhesive drug delivery system are delivery system, which utilized the property of bio adhesion of certain polymers, which become adhesive on hydration and hence can be used for targeting a drug to particular region of the body for extended period of time. The ability to maintain a delivery system at a particular location for an extended period of time has great appeal for both local as well as systemic drug bioavailability.

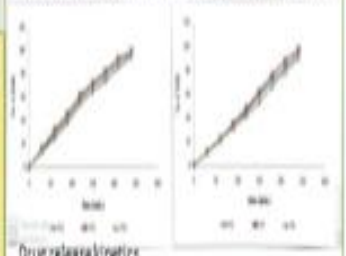
A drug can be easily applied and localized to the application site and can be removed from there if necessary

METHODOLOGY:

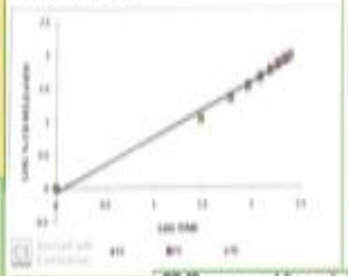
Preparation of captopril buccal patch . Accurately weighed quantities of EC and PVP was dissolved in ethanol separately in two beakers and HPMC was first dissolved in 50% water and then in 50% ethanol allowed for some time for swelling of polymer, amount of drug to be calculated such that 3*3cm diameter of petri plate must contain drug and added to the polymer solution and stirred well using magnetic stirrer and propylene glycol was added gradually with continuous stirring then 30 ml resultant mixture was poured into each petri dish. Drying was carried out at 40°C for 24 hrs in hot air oven. Similarly, patches were also prepared using glycerine as plasticizer by solvent casting technique.

Composition of mucoadhesive buccal patches containing captopril

IN-VITRO drug release data of captopril buccal patches

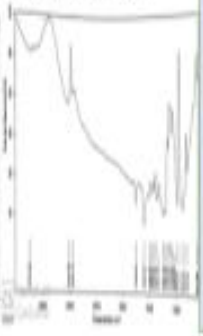


Drug release kinetics



FT-IR spectrum of captopril

FT-IR spectrum of Captopril and mix of all polymer



DISCUSSION

A successful attempt was made to formulate mucoadhesive buccal patches containing captopril using mucoadhesive polymer like HPMC, PVP, EC by solving testing method. The prepared patches were evaluated based on their physical characteristics like weight uniformity, patch thickness, percentage swelling , surface pH, folding endurance and in-vitro mucoadhesion time .and they were evaluated for drug content uniformity ,in-vitro drug release study and in-vitro permeation study. The stability study was conducted as per ICH guidelines for 3 months

CONCLUSION :In the present study, an attempt was made to formulate and evaluate mucoadhesive buccal patches of captopril. preformulation studies were performed by FTIR, pH, drug content, swelling index, mucoadhesion time, *in vitro*,

Drug release kinetics, the selected 6 formulation f2,f3,f6,f11,f12,f15 were stored at 45±0.5°C in hot air oven in 3 months. All were found to be stable at 45°C with respect to the drug content and *in-vitro* drug profile.

Among various formulation F3&F12 exhibited good mucoadhesion, folding endurance , swelling index &the drug release as compared to other formulations.

From the above results it can be concluded that captopril can be delivered in the form of buccal patches release pattern of a drug from these patches can be altered by using different formulation variables

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a paper entitled Evaluation of Mucoadhesive Buccal Patch *in the*

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Principal

Coordinator

DESIGN OF FLOATING IN SITU GEL OF MUCOLYTIC AGENT BY CATION INDUCED GELATION OF NATURAL POLYSACCHARIDES

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DR-08

ABSTRACT

The aim of the present research work was to prepare and evaluate oral floating in situ gel of Ambroxol hydrochloride by using natural polymer i.e. gelrite and sodium alginate. Ambroxol hydrochloride is an oral systemically active mucolytic agent, which is used in the treatment of acute and chronic respiratory disorders characterized by the production of excess and thick mucus.

INTRODUCTION

The oral route is considered as the most favoured, popular and practiced way of drug administration, because of its ease of administration, flexibility in designing, ease of production and low cost. From immediate release to site specific delivery, oral dosage forms have really progressed and large number of the drug available in the market are administered by oral route

METHODOLOGY

Preparation of in situ gelling solution with combination Gelrite and sodium alginate : Gelrite dissolved gelrite in around 30 ml of deionized water containing sodium citrate, heated 90°C and cool below 40°C. Similarly sodium alginate solution was Dissolved sodium alginate 30 ml deionized water separately, heated 90°C and cool 40°C and calcium chloride and Ambroxol HCL were added stirring. 1st and 2nd solution were mixed stirring then preservative methyl paraben (0.02% w/v) added to above mixture. Then final volume was adjusted to 100 ml using deionized water. The resulting in situ gelling solution containing Ambroxol HCL was finally stored in amber coloured narrow mouth bottle until further use

Composition of floating *in situ* gel

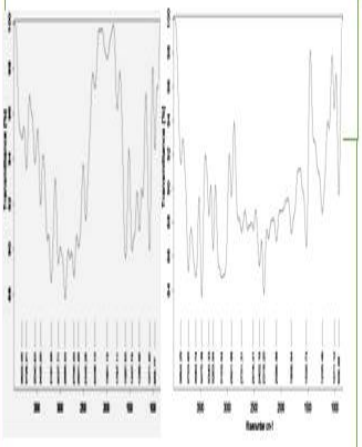
Ingredients	Formulations								
	F1	F2	F3	F4	F5	F6	F7	F8	F9
Ambroxol hydrochloride(mg)	600	600	600	600	600	600	600	600	600
Gelrite (mg)	500	750	1000	-	-	-	250	500	750
Sodium alginate (mg)	-	-	-	500	750	1000	750	500	250
Sodium citrate (mg)	170	170	170	170	170	170	170	170	170
Calcium chloride (mg)	16	16	16	16	16	16	16	16	16
Methyl paraben (mg)	20	20	20	20	20	20	20	20	20
Deionized water (qs)	100	100	100	100	100	100	100	100	100

in vitro drug release studies of *in situ* gelling formulations batch F3 &F9

Code	Zero order	First order	Higuchi	Korsmeyer-Peppas		Best fit model
	R^2	R^2	R^2	R^2	n	
F3	0.9814	0.9703	0.9736	0.9877	0.6778	Korsmeyer-Peppas
F9	0.9636	0.9832	0.9885	0.9793	0.684	Higuchi

FT-IR spectrum of Ambroxol hydrochloride

FT-IR spectrum of Ambroxol hydrochloride + all excipients



DISCUSSION

The study was carried out to prepared oral floating insitu gel of Ambroxol HCL is soluble in water & absorbance of drug found to be 244nm. FTIR spectrum showed compatibility of drug excipients. Further it was evaluated for various physicochemical parameter like pH (1.2), MP 233°C, good gelling capacity, optimum viscosity suitable for oral administration and acceptable cumulative drug release 78.72% and 83.5respectively in 8 hrs.

Conclusion

In the present study, an attempt was made to formulate and evaluate floating *in situ* gel of Ambroxol hydrochloride by using natural polysaccharides i.e gelrite and sodium alginate. Formulation F3 and F9 were selected as best formulation good gelling capacity, optimum viscosity and acceptable % CDR aster 8 hrs shown by them. Formulation F3 followed Korsmeyer-Peppas Model kinetic (non-fickian transport) with R^2 value 0.9877 & n value 0.6778 for the drug release from the formulation. Formulation F9 followed Higuchi model kinetic with R^2 value 0.9885 for the drug release from the formulation. Results the stability of selected formulations as there were no significant changes found for the parameters considered after 3 month stability study.

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Theme:Drug Resource Sustainability

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of R R College of Pharmacy Bangalore *has ~~participated~~ / presented a paper entitled* Design of Floating Ambroxol HCl By Ion activated In-situ Gelling system. *in the National conference on "Drug Resources: Biodiversity and Conservation" sponsored by Rajiv Gandhi University of Health Sciences, Karnataka and Rehamo Bangalore, held at T. John College of Pharmacy, Bangalore on 09.11.2019.*

Principal

Coordinator

DESIGN AND IN VITRO CHARACTERISATION OF GASTROMUCOADHESIVE TABLETS OF PANTOPRAZOLE A PROTON PUMP INHIBITOR

DR-10

Vinitha.R[1*], A Geethalakshmi[1]., Vikash Kumar Chaudhary[1], G Parthasarathy[1]

[1]Department of Pharmaceutics, R R College of Pharmacy, Bangalore-90 Email id: vinithar1611@gmail.com

ABSTRACT:

The objective of this research work is to formulate and evaluate the gastro mucoadhesive tablets of pantoprazole with a goal to achieve local action of drug in the stomach by increasing gastric residence time and control the drug release for prolong period of time. Gastric mucoadhesive tablet offer several advantages such as it has site specific drug delivery, long resident time in stomach and offers prolonged drug release. Pantoprazole is proton pump inhibitors used as antiulcer agent.

INTRODUCTION:

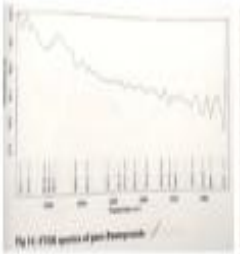
Gastroretentive dosage forms are the systems that can stay in gastric region for several hours and thus prolong the gastric residence time of the drugs. After oral administration, a dosage form is retained in the stomach and releases the drug in a controlled and sustained manner. PPIs block the acid producing enzymes system in the stomach wall and prevent acid production in the stomach. Lack of acid in the stomach prevents ulcer formation; promotes healing of existing ulcers in the oesophagus, stomach and duodenum and provides symptom relief.

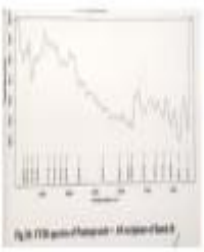
METHODOLOGY:

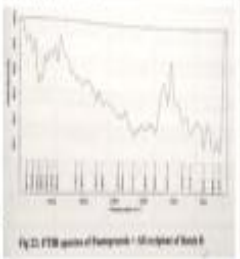
Method of preparation of gastro mucoadhesive tablets

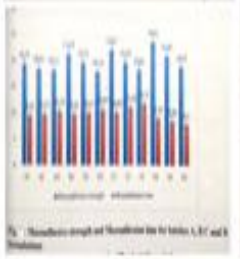
Direct compression method was employed to prepare gastro mucoadhesive tablet of pantoprazole using Carbopol 934p, HPMC K15M, HPMC K4M, Sodium alginate and Chitosan as polymers. All the ingredients including drug, polymer and excipients were weighed accurately according to the batch formula and were passed through sieve no 40 to get uniform particle size. All the ingredients were mixed except lubricants and blended in glass mortar uniformly. After mixing lubricant is added and mix for 2mins. The prepared blend of each formulation was compressed by using 8mm punch on a tablet punching machine.

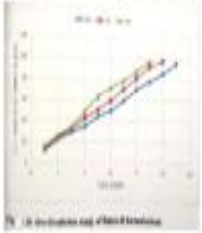
S L N O	INGREDIENTS	FORMULATIONS					
		BATCH A			BATCH B		
		A1	A2	A3	B1	B2	B3
1.	Pantoprazole	40	40	40	40	40	40
2.	Carbopol 934P	35	30	20	35	20	20
3.	HPMCK4M	25	30	40	---	---	---
4.	HPMCK15M	---	---	---	25	30	40
5.	Microcrystalline cellulose	25	25	25	25	25	25
6.	Talc	5	5	5	5	5	5
7.	Lactose	70	70	70	70	70	70
	Total	200	200	200	200	200	200











DISCUSSION:

Preformulation study like Drug Excipient compatibility study by determination of λmax and FTIR study. Precompression parameters like Angle of repose, Bulk density, tapped density, Compressibility index, Hausner's ratio. Post compression parameters like Tablet dimension, Hardness test, Weight variation test, Friability test, Drug content uniformity, Swelling studies, Mucoadhesive strength, Ex vivo mucoadhesive time, In vitro release study, Drug release kinetics, Stability studies.

CONCLUSION:

The study performs reveals the drug polymer mixture subjected to FTIR study suggested that there was no drug-polymer and polymer-polymer interaction. All the prepared tablets were in acceptable range of weight variation, hardness, thickness, friability and drug content as per pharmacopoeial specification. All the formulation showed good swelling index up to 8 hrs in 0.1N HCl maintaining the integrity of formulation which is required for bio adhesion. All the formulations showed good mucoadhesive strength of 18.11 to 24.61gm with high force of adhesion.

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4. Ganga S. machida Y. mucosal adhesive dosage forms. Pharm Int. 1985:6:196-200.

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Principal

Coordinator

FORMULATION AND EVALUATION OF GASTRIC FLOATING DOMPERIDONE MICROSPHERES

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123

ABSTRACT

The main objective of the research work is to control the drug release in the stomach by designing a effervescent floating drug delivery system containing Domperidone as a model drug by using polymer (Sodium alginate) in different cross linking agent like CaCl2 and BaCl2 solution, gas generating agent (Sodium bicarbonate).

INTRODUCTION:

Gastric emptying of dosage forms is an extremely variable process and ability to prolong and control the emptying time is a valuable asset for dosage forms, which reside in the stomach for a longer period of time than conventional dosage forms. Several difficulties are faced in designing controlled release systems for better absorption and enhanced bioavailability. One of such difficulties is the inability to confine the dosage form in the desired area of the gastrointestinal tract.

METHODOLOGY:

Floating microspheres were prepared by the Ionic Gelation method. Various concentration of polymer and the drug (Domperidone) were dissolved in Methanol (5 ml) and made as a slurry, then Gas forming agent (Sodium carbonate) was added and methanol was added to make the solution of slurry. The system is stirred using magnetic stirrer at constant speed in room temperature for 2-3 hr for proper mix. The resulting solution was dropped through a 26 G syringe needle into a 4% (w/v) CaCl2 solution (Formulations A1-A5) and 4% BaCl2 solution (Formulations F1-F5). The solution containing suspended particles were stirred with a magnetic stirrer for 10 mins to improve the mechanical strength of the particles and allowed to complete the reaction. The drug loaded floating microspheres formed were filtered, washed with distilled water and dried in a hot air oven at 60°C for 30 mins and then evaluated.

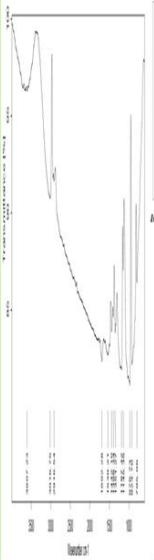
Formulation of Domperidone Floating Microspheres

s.no	Batch code	Drug (gm) (Domperidone)	Polymer (gm) (Sodium alginate)	Sodium carbonate (mg) (Gas forming agent)	Cross linking agent (4%w/v)
1	A_1	0.5	0.5	250	$CaCl_2$
2	A_2	0.5	1.0	250	$CaCl_2$
3	A_3	0.5	1.5	250	$CaCl_2$
4	A_4	0.5	2.0	250	$CaCl_2$
5	A_5	0.5	2.5	250	$CaCl_2$
6	F_1	0.5	0.5	500	$BaCl_2$
7	F_2	0.5	1.0	500	$BaCl_2$
8	F_3	0.5	1.5	500	$BaCl_2$
9	F_4	0.5	2.0	500	$BaCl_2$
10	F_5	0.5	2.5	500	$BaCl_2$

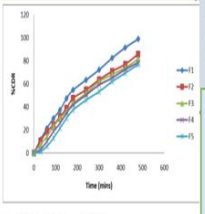
In-vitro release kinetics "k" values:

S.NO	Hix.crow.	Zero order	1st order	Matrix	Peppas	n-- values	Best fit model
	k	k	k	k	k		
A1	0.0012	0.2237	-0.0049	4.0029	1.2451	0.7083	Peppas
A2	0.0011	0.2170	-0.0044	3.8716	0.8153	0.7785	Hix Crow
A3	0.0010	0.2062	-0.0039	3.6564	0.4313	0.8817	Hix Crow
A4	0.0010	0.1977	-0.0036	3.4866	0.1660	0.9439	Hix Crow
A5	0.0008	0.1788	-0.0030	3.1242	0.0348	0.9803	Hix Crow
F1	0.0014	0.2327	-0.0063	4.1470	0.9399	0.7647	Peppas
F2	0.0010	0.1999	-0.0036	3.5577	0.8006	0.7655	Hix Crow
F3	0.0009	0.1902	-0.0033	3.3706	0.4465	0.8605	Hix Crow
F4	0.0008	0.1822	-0.0030	3.2019	0.1060	0.8991	Hix Crow
F5	0.0008	0.1708	-0.0028	2.9616	0.0031	0.9942	Hix Crow

FT-IR spectrum of Domperidone

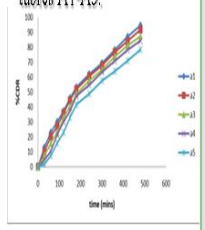


In-vitro Dissolution test tables F1-F5:



In-vitro Dissolution test graph F1-F5:

In-vitro Dissolution test tables A1-A5:



In-vitro Dissolution test graph A1-A5:

DISCUSSION: The present investigation was to prepare floating microspheres of Domperidone to improve the bioavailability by increasing residence time in stomach. Floating microspheres were formulated by Ionic Gelation method, using Sodium Alginate as polymer and CaCl2 and BaCl2 as solvents. Sodium carbonate is used as gas forming agent. The prepared formulations were characterized for their micromeritic properties, particle size, percentage yield, morphology, buoyancy studies, drug entrapment and *in-vitro* drug release studies. Almost all the formulations showed fairly acceptable values for all the parameters evaluated. From all the prepared formulations, the ideal formulations A4 & F3 were selected. This study has suggested that floating microspheres could be a candidate novel drug delivery device to improve the bioavailability of drug.

CONCLUSION: The study conducted on Formulation and Evaluation of Gastric Floating Microspheres for Anti-Emetic Drug reveals among all formulations A4 & F3 were selected with the drug polymer ratio was found to be satisfactory in terms of excellent micromeritic properties, percent yield (89.26%), percent drug entrapment efficiency (91.17%), in-vitro buoyancy (92.05%) and highest in-vitro drug release of 82.75% & 81.49% in sustained manner with constant fashion over a extended period of time of 8 hrs. The study reveals satisfactory results with a further scope of pharmacokinetic and pharmacodynamic evaluation.

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STUDY OF ENHANCEMENT IN RATE OF DISINTEGRATION OF DESLORATADINE FAST DISPERSIBLE TABLETS BY SUBLIMATION METHOD

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ABSTRACT

The aim of present work was preparation of fast disintegration of tablet of desloratadine by using sublimation technique employing direct compression method. The method involves the compression of tablets and subseqently removal of subliming material from compressed tablets. The tablet were evaluated for thickness , weight variation, hardness, friability,drug content uniformity, wetting time, water absorption ratio, in-vitro disintegration time and in-vitro drug release.

INTRODUCTION:

Mouth dissolving tablets are state –of- the art drug delivery systems with high acceptance and compliance. The major advantange is administration at any time without water, self-medication and stability compared to parenteral which increased patient compliance.

Desloratadine is an advanced antihistaminic compound.

Combination of sublimation technique superdisintegrants can be helpful to formulate new fast disintegrating tablets. In the present study we investigate the possibility of the method which is best suited in formulation of fast disintegrating tablets of desloratadine towards the improvement in disintegrating time as well as patiennt

METHODOLOGY:

MATERIAL AND METHODOLOGY

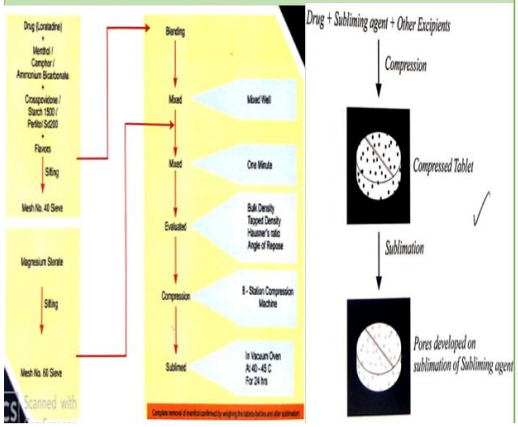
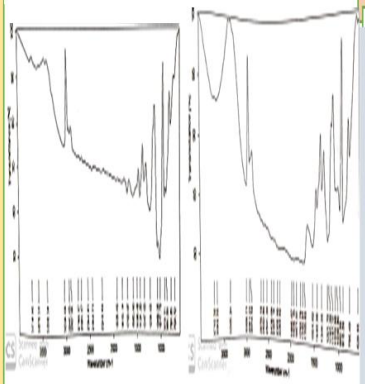
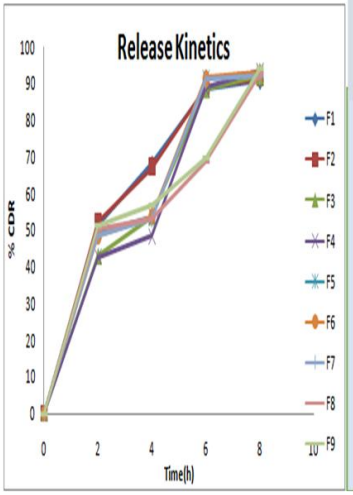


Table: 1 Formulation Chart



FTIR Spectra of Desloratadine

FTIR Spectra of Desloratadine + all excipients



DISCUSSION

In vitro studies of these formulations containing34.28% subliming agent released more quantity compared to 11.42% and 22.84%. Among the subliming material used, tablets prepared by using Ammonium Bicarbonate as a subliming agent were of good and in nature, considering themechanical properties and the ease of manufacture. While the tablets prepared by using camphor were of average quality and those prepared by menthol as a subliming agent were difficulty to punch due to their poor flow and mechanical properties. The results of the evaluation parameters demonstrate that it is possible to design and develop fast disintegrating tablets of desloratadine by using sublimation method.

CONCLUSION:

Fast disintegrating tablets of desloratadine, can be efficiently and successfully formulated by employing sublimation method.

Preformulation studies .Evaluation parameters like hardness, friability, indicated good to passable mechanical resistance of the tablet for all the formulations.The in-vitro disintegration, wetting time and parameters revealed that pearlitol 200 SD in the 30% concentration act as gives good tablet showing better friability and disintegration time.

The in-vetro release studies showed 97.29% of drug release with in 10 mins from the formulation prepared by sublimation method.

BIBLIOGRAPHY:

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A STUDY ON IMPROVEMENT OF DISSOLUTION PROFILE OF ETODOLAC BY LIQUISOLID COMPACT TECHNIQUE

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DR-12

Abstract

The main objectives of present investigation was to enhances the dissolution rate of water insoluble drug Etodolac by using liquid compact techniques. Several liquisolid compact tablets were preapared by using carrier material such as microcrystalline. Cellulose and coating material such as silica gel in different ratios (5:1,10:1, 20:1). PEG-400 used as non-volatile water miscible liquid vehicles. Formulation F8&F9 found to be stable after performing physical and chemical parameters at suitable intervals.

INTRODUCTION

Liquisolid technique is a new and promising method that can change dissolution rate of drugs. It as been used to enhance dissolution rate of poorly water-soluble drugs. Etodolac drug is a NSAIDs, are drugs with analgesic and antipyretic effects & which have, in higher doses, anti inflammatory effects. As analgesics, NSAIDs are unusual in that they are non narcotic. The non-steroidal anti-inflammatory drug Etodolac applying liqisolid compact technique. Etodolac is a NSAID with potent analgesic and anti- arthritic properties.

Methodology

General method of preparation of liquisolids:

A drug was initially dispersed non –volatile solvents PEG-400as liquid vehicles with different drug vehicles ratio & mixture of different polymers & excipients were added above liquid by mixing in mortar. & above binary mixture other remaining additives added & mix 10 to 20 min in a mortar. Final mixture compressed using tableting machine to achieve tablet hardness, final liquid granules for solubility, dissolution, flowability, compressibility. Etodolac prepared by mixing 100mg of drug MCC & silica gel & mix for 10 min. Glindant & lubricant add then compressed by tablet punching machine.

Formulation of Etodolac different polymers

Formulation code	Etodolac Drug	PEG-400	MCC	Silica gel G	Magnesium stearate	Talc
5:1						
F1	100mg	50mg	300mg	60mg	10mg	5mg
F2	100mg	100mg	400mg	80mg	10mg	5mg
F3	100mg	150mg	500mg	100mg	10mg	5mg
10:1						
F4	100mg	50mg	375mg	37.5mg	10mg	5mg
F5	100mg	100mg	500mg	50mg	10mg	5mg
F6	100mg	150mg	625mg	62.5mg	10mg	5mg
20:1						
F7	100mg	50mg	500mg	25mg	10mg	5mg
F8	100mg	100mg	666.6mg	33.33mg	10mg	5mg
F9	100g	150mg	833.3mg	41.66mg	10mg	5mg

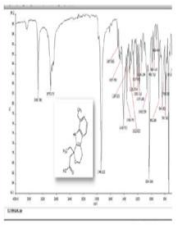

Figure : FTIR spectrum of Etodolac

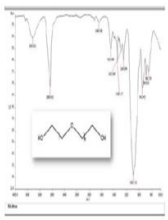

Figure 6: FTIR spectrum of Etodolac with Polyethylene Glycol (PEG-400)

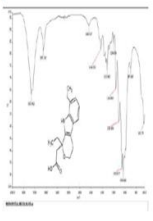

Figure : FTIR spectrum of Etodolac with Microcrystalline cellulose

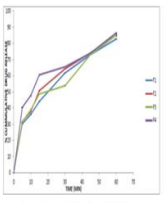

Figure : Comparative in vitro drug release profile of F1-F4

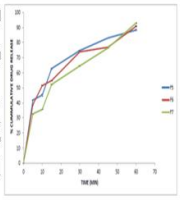

Figure : Comparative in vitro drug release profile of F5-F7

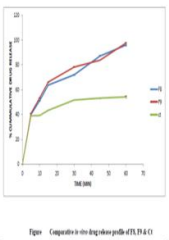

Figure : Comparative in vitro drug release profile of F8, F9 & C1

DISCUSSION: In present an attempt has been made to enhance the solubility of BCS-II drug by using liquisolid compact technique. Etodolac is a white fine odourless powder with the MP 146.5˚C, soluble in ethanol methanol. FTIR spectrum obtain showed no major shift indicating chemical integrity of drug. The formulation from F1 to F9 were formulated when MCC were used as carrier and silica gel as coating material in ration such as (5:1, 10:1, 20:1).

Conclusion:

The aim of the study to increasing the solubility preformulation studies like MP, flow properties, FTIR, and in-vitro drug release of drug compact showed increase in these (F3,F6,F9) exhibited more release. The formulations of F8&F9 were selected for stability studies on the basis of their better and satisfactory evaluation parameters. In formulation showed there was not much variation in physical. Parameters even after the period of 3 months. Thus, Etodolac liquisolid compact tablet enhanced dissolution rate

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Research Paper Presented= 05(International Conferences)

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6th INTERNATIONAL CONFERENCE
October 18 & 19, 2019

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Participated / Presented a paper entitled FORMULATION & EVALUATION OF

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BENCILLIN SODIUM INSITU GELLING SYSTEM FOR GINGIVITIS in the 7th International Conference

on "HEALTHCARE TECHNOLOGY AND MANAGEMENT" held on 4th & 5th February, 2019.

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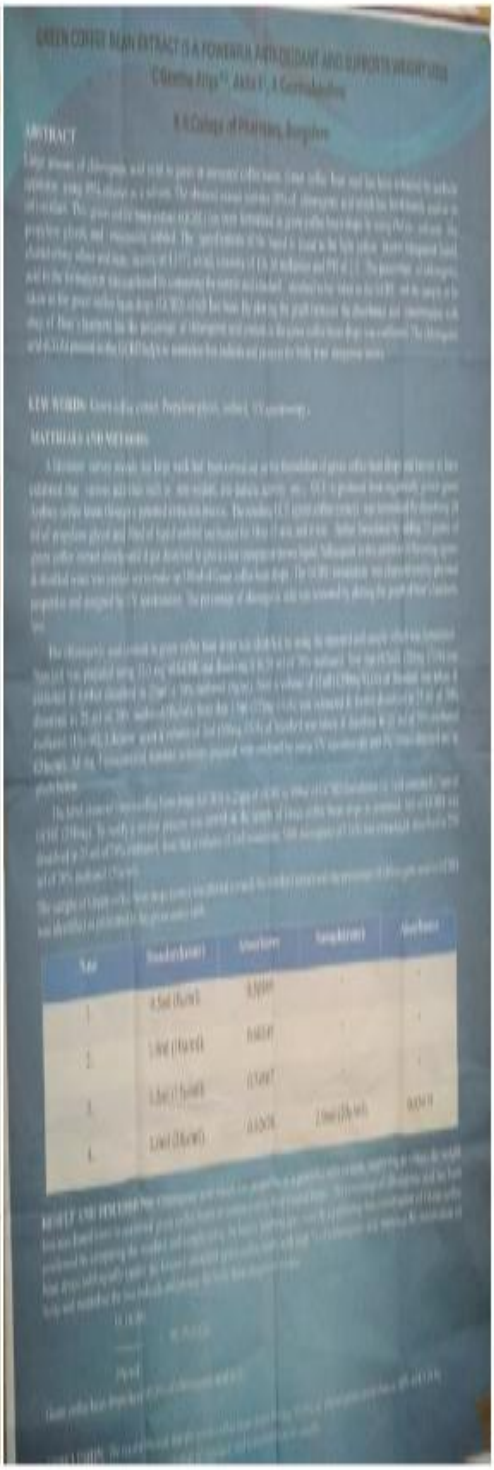

STUDENT SEMINAR

Sub: protocol presentation

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CONTENT

- Need for study
- Objective
- Method of preparation
- Evaluation
- Mechanism

Need for study

- The Transdermal drug delivery system (TDDS) is defined as a delivery device, which upon application on a suitable skin surface will be able to deliver the drug to the systemic circulation at a sufficient concentration to ensure therapeutic efficacy. TDDS is ideally suitable for drugs that need to be administered for diseases those are chronic in nature. The inherent drawback of hepatic first pass metabolism greatly reduces the effective drug concentration in the systemic circulation, leading to administration of high doses of conventional dosage formulations[1].

- Arterial hypertension is a major cause of morbidity and mortality because of its association with coronary heart disease, cerebrovascular disease and renal disease. The extent of target organ involvement (i.e. heart, brain and kidneys) determines outcome. North American studies have shown that hypertension is a major contributor to 500 000 strokes (250 000 deaths) and 1 000 000 myocardial infarctions (500 000 deaths) per annum. National surveys continue to reveal that hypertension is often not detected and, where diagnosed, is often inadequately treated. Among hypertensive patients, only 25% appear to be well controlled. This is particularly true of isolated systolic hypertension. Yet the prevalence of isolated systolic hypertension increases with age. Indeed, the proportion of subjects suffering from isolated systolic hypertension, as opposed to systolic and diastolic hypertension, increases from 20% in the under 40 yr. to 80% in the 60–69 yr old, and to 95% in those >80 yr.

- Cilnidipine is a novel and unique dihydropyridine calcium antagonist that possesses a slow-onset, long-lasting vasodilating effect. Cilnidipine was reported to inhibit the release of noradrenaline from sympathetic nerve endings in the rat mesenteric vasculature. Recently, cilnidipine was found to have potent inhibitory action on the N-type as well as the L-type voltage-dependent calcium channels in rat dorsal root ganglion neurons. Regarding the clinical advantages of cilnidipine over other dihydropyridine, we have shown that cilnidipine has less influence on heart rate and the autonomic nervous system than nifedipine Retard and causes less tachycardia than nisoldipine in hypertensive patients. Moreover, in spontaneously hypertensive rats (SHRs), cilnidipine was reported to cause an inhibition of the pressor response induced by acute cold stress in addition to its hypotensive effect.

- This finding appears to be, at least in part, explained by its unique pharmacological properties. However, no randomized studies have been carried out to investigate whether this finding applies to hypertensive patients.

Objective of study

- The present work is planned with the following objectives.
- To prepare transdermal patches containing cilnidipine using various polymers.
- To evaluate the transdermal patches for various physicochemical properties
- To study the *in vitro* drug release/permeation through semipermeable membrane

Polymers

Hydroxypropylmethylcellulose, (HPMC), hydroxypropylcellulose (HPC) methylcellulose (MC), Hydroxyethylcellulose (HEC) carbopol any other suitable polymer.

Plasticizers

Glycerin Or Poly ethylene glycol (PEG) or Triethyl Citrate or any other suitable plasticizer.

METHOD

- 1) Preparation of transdermal patches by Solvent Evaporation Technique or Solvent Casting or any other suitable method.

PHYSIOCHEMICALEVALUATION

- **Moisture Uptake**: Transdermal patches were weighed and placed in desiccators containing a saturated solution of sodium chloride at 74% relative humidity (RH). After first week, the patches were taken out and weighed. The percentage of Water Absorptive Capacity (Moisture Uptake) was calculated as the difference between the final and initial weight with respect to the initial weight
- **Flatness**: Longitudinal strips were cut out from the prepared patch, the length of each strip was measured, and then variation in the length due to the non-uniformity in flatness was measured. Flatness was calculated by measuring constriction of strips, and a 0% constriction was considered to be 100% flatness.

- **Folding endurance**: A strip of 4 cm^2 was subjected to folding endurance by folding the patch at same place repeatedly several times until a visible crack was observed and the values were reported.
- **Stability studies:** stability studies were carried out for selected formulation at 40 ± 0.5˚c and 75±5% relative humidity for 3 month using programmable environmental test chamber. the sample were evaluated for physicochemical parameters and drug diffusion

- T**hickness** **::** Patch thickness was measured using micrometer at three different places and the mean value plus standard deviation (SD) was calculated
- **Uniformity of weight**: Prepared patches were cut into 3.14 cm^2 pieces and weight of each patch was determined by using digital balance. The average weight of each patch and standard deviations were calculated.
- **Content uniformity test**: The specific area of patches will be dissolved in a suitable solvent and filter through the filter medium and the drug with suitable medium (UV or HPLC).
- **Moisture content**: The prepared patches were weighed and kept in desiccator containing activated silica at room temperature for 24 hr. The individual patches were weighed on every alternate day until a constant weight was achieved. The percentage of moisture content was calculated by determining the difference between initial and final weight with respect to final weight

IN VITRO PERMEATION EVALUATION

Franz diffusion cell

- Drug release will be performed with freshly prepared patches using suitable diffusion cells containing suitable dissolution medium and stirred at 50 rpm with magnetic stirrer. Circular patches having suitable diameter and thickness will be place on the semi-permeable membrane which is fixed between the donor and receptor compartment of diffusion cell.

MECHANISM OF ACTION

- Cilnidipine act on the L-type calcium channels of blood vessel by blocking the incoming calcium and suppressing the contraction of blood vessels, there by reducing blood pressure.
- Cilnidipine also work on the N-type calcium located at the end of the sympathetic nerve, inhibiting the emission of norepinephrine and suppressing the increase in stress blood pressure

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SUBJECT : RESEARCH ARTICLE PRESENTATION

Presented by: Pooja Yadav

Guided by :K.MAHALINGAN

Research article on sustained release matrix tablet of rabeprazole using wet granulation technique

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Abstract

- Rabeprazole, a member of substituted benzimidazoles, inhibits the final step in gastric acid secretions.
- This drug claims to cause fastest acid separation (due to higher pKa), and more rapidly converts to the active species to aid gastric mucin synthesis.
- The most significant pharmacological action of Rabeprazole is dose dependent suppression of gastric acid secretion; without anticholinergic or H2-blocking action.
- It completely abolishes the hydrochloric acid secretion as it is powerful inhibitor of gastric acid.
- Rabeprazole is acid labile and hence commonly formulated as an enteric coated tablet. The absorption of rabeprazole occurs rapidly as soon as tablet leaves the stomach.

Introduction:

- Retention of drug delivery systems in the stomach prolongs overall gastrointestinal transit time improving oral bioavailability of the drugs that are having site specific absorption from the stomach or upper part of the small intestine.
- Therefore different approaches have been proposed to retain the dosage form in the stomach including bioadhesive systems, swelling, and expanding systems and delayed gastric emptying devices to achieve gastric residence time for sustained drug release.
- The goal of any drug delivery system is to provide a therapeutic amount of drug to the proper site in the body to achieve promptly and then maintain the desired drug concentration.
- This deliberate control of drug release is achieved in sustained release dosage form as it prolongs the therapeutic effect by continuously releasing medication over an extended time after administration of a single dose.

Materials and Methods

Materials

- Rabeprazole was received as a gift sample from Elder Pharmaceuticals Pvt Ltd, Dehradun (India).
- The polymer HPMC E-15, Carbopol 934, Sodium CMC was procured from Elder Pharmaceuticals Pvt Ltd, Dehradun (India).
- Talc, Magnesium stearate was from S.D. Fine Chem. Ltd. Mumbai. All the chemicals were of analytical grade.

Methods

- Prepared by wet granulation technique.
- Identification of Rabeprazole was examined by FT-IR and compared with the reference spectrum of drug.

Method used to estimate rabeprazole sodium

- The drug Rabeprazole Sodium was dissolved in phosphate buffer 7.2 to obtain 10 µg/ml solutions.
- Further diluted with the same buffer and scanned for maximum absorbance (λmax) in a double beam UV-VIS Spectrophotometer, between the UV ranges from 200 to 400 nm against phosphate buffer pH 7.2 as blank; and λ max is found to be 287 nm.

Preparation of calibration curve

- Accurately 25 mg of Rabeprazole was taken in a 100 ml volumetric flask.
- Sufficient amount of water was added to make up the mark (stock solution).
- 10 ml of the volume was made up to the mark with water using the standard solution 1 ml, 2 ml, 4 ml, 6 ml, 8 ml, 10 ml that was withdrawn individually and in each case the volume was made up to 10 ml.
- The absorbance of these solution were measured spectrophotometrically at a suitable wavelength.
- The observed absorbance was plotted against concentration

[Table 1 and Figure 1].

Table 1

Data for standard curve of rabeprazole in distilled water

Conc. (Microgm/ml)	Absorbance
1	0.091
2	0.15
4	0.289
6	0.417
8	0.535
10	0.674

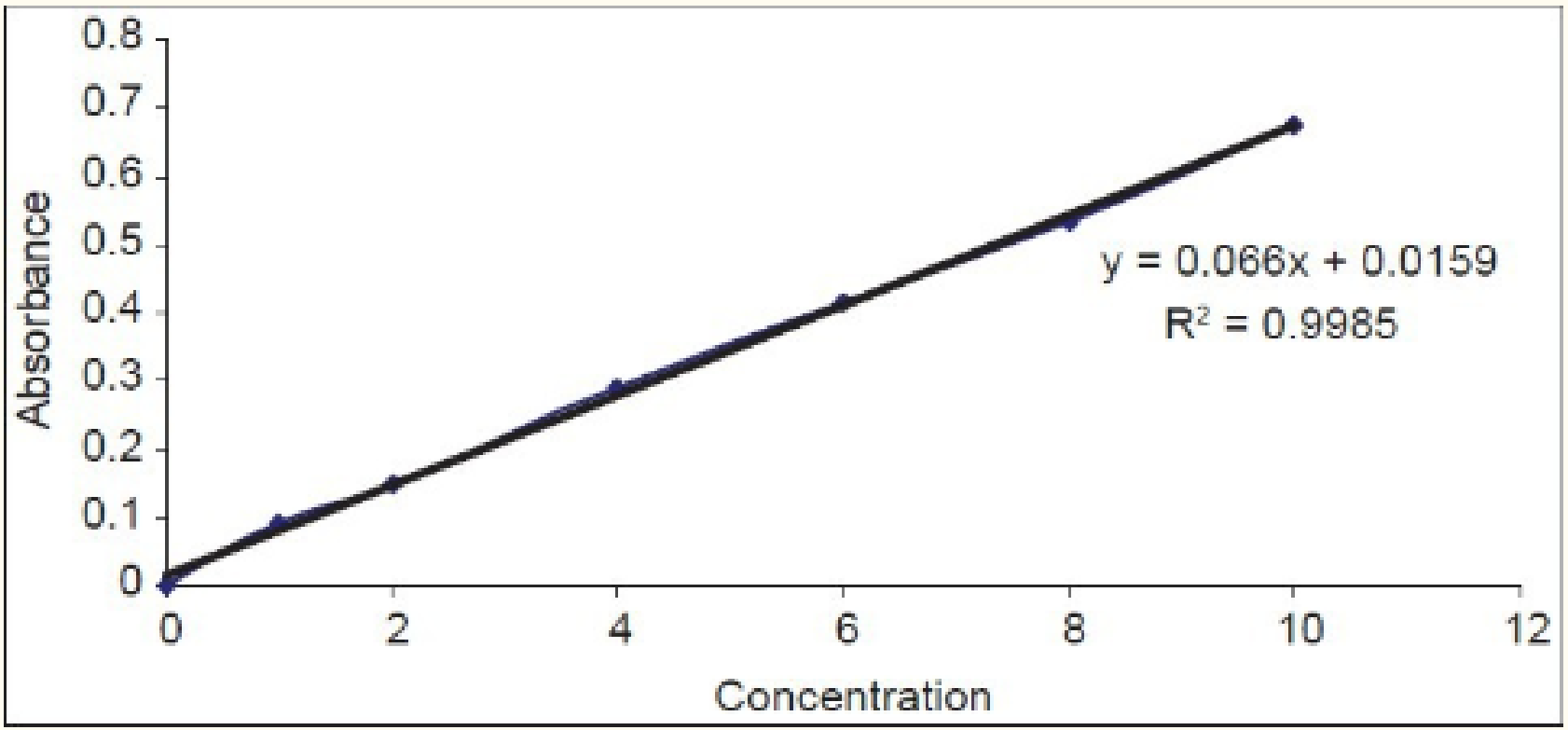

Figure 1

Standard curve of rabeprazole

Fabrication of tablets

Wet granulations

- All the polymers and active ingredients were passed through sieve no. 80 separately.
- Accurately weighed amount of polymers and excipients were thoroughly mixed in glass mortar pestle.
- The granules were prepared by wet granulation technique and passed them to sieve no. 20 and dried in hot air oven at 45°C.
- The granules were then mixed properly with magnesium stearate, talc and punched with the help of automatic punching machine to a desired hardness, shape, and size [Table 2].

Table 2

Formulation chart

Ingredients (quantity/tab)	Batch code (mg)					
	F1	F2	F3	F4	F5	F6
Rabeprazole	50	50	50	50	50	50
HPMC E15	50	100	-	-	50	-
Carbopol 934	-	-	50	100	-	50
Sodium CMC	-	-	-	-	50	50
Lactose	150	100	-	-	100	100
Talc	3	3	3	3	3	3
Mag. state	2	2	2	2	2	2

Evaluation test

1. Determination of hardness of tablet

- Randomly sampled 5 tablets in each batch of formulation were used for the determination of hardness with the help of Monsanto type hardness [Table 3].

2. Determination of friability

- Roche friabilator is used in which approx. 6 gm of dedusted tablet are subjected to 100 freefalls of 6 inches in rotating drum at 25 rpm and then reweighed [Table 3].

$$F = 100\ (1 - w$$

3. Determination of weight variation

- 20 tablets were selected at random and weighed accurately; the average weight of the tablet was calculated.
- Then the deviation of individual weight from the drug weight was calculated [Table 3].

4. Determination of thickness of tablets

- The individual crown to crown thickness of ten tablets was determined using slide calipers for each batch [Table 3].

5. Measurement of the density of formulation

- The approach densities of the tablet were calculated from the volumes and masses in triplicate.
- The volumes (v) of the cylindrical tablets were calculated from their heights (h) and radius (r) are both determined with micrometer gauze using the mathematical equation for a cylinder [Table 3].

$$V = \prod r^2 h$$

6. Determination of drug content in tablets

- 3 tablets from each batch were selected randomly and transferred to a 100 ml volumetric flask were, filled up with 0.1N HCL.
- Kept it for 48 hours then took 1ml from each of volumetric flask was transferred to the test tubes samples were then filtered, suitable diluted and analyzed spectrophotometrically at a suitable wavelength [Table 3].

7. Angle of repose

- It was determined by using funnel method. The accurately weighed spheres were taken in funnel, and were adjusted in such a way that the tip of funnel just touches the apex of the heap of blends.
- The blends were allowed to flow through the funnel, freely on the surface.
- The diameter of the powder concentration was measured; angle of repose was calculated by using following equation [Table 3].

$$\text{Tan } ø = h/r$$

- Where ; h = height of pile , Ø = angle of repose , R = radius of base pile
- 25 = excellent flow
- 25-35 = good flow
- 30-40 = passable
- >40 = very poor flow

8. Bulk density

- Apparent bulk density was measured by pouring the pre-weighed blend into a graduated cylinder. The bulk volume of the blend was determined, and then the bulk density was calculated by using the formula [Table 3].

$$P$$ 

9. Tapped density

- The measuring cylinder containing a known mass of blend was tapped for a fixed time and the min. Volume (Wt) occupied in the cylinder was measured; the tapped density (pt) was calculated by using the following formula [Table 3].

$$P$$ 

10. Consolidation index %

- It is one method for determining flow properties and also called as carr's index of compressibility.
- It is indirectly related to the relative flow rate, cohesiveness, and particle size.
- It is simple, fast, and popular method of predicting powder flow characteristic [Table 3].

$$\% \text{ consolidation index} = \frac{\text{Tapped density - Bulk density}}{\text{Tapped density}} \times 100$$

Table 3

Evaluation of different parameters

Batch code	Evaluating parameters							
	Hardness kg/cm^2	Thickness (cm)	Weight variation (%)	Angle of repose (°)	Bulk density gm/cm^3	Tapped density gm/cm^3	Carr's index %	Drug content %
F1	3	0.3	2.4	14.93	0.45	0.55	18.18	95.3
F2	3.5	0.35	3.1	22.26	0.63	0.79	20.25	98.9
F3	4	0.4	2.8	30.43	0.57	0.62	8.06	90.2
F4	3	0.3	2.7	28.21	0.48	0.57	15.78	91.2
F5	3	0.4	1.3	26.43	0.59	0.68	13.23	94.6
F6	4.0	0.35	2.6	25.21	0.49	0.53	7.54	97.2

Results and Discussion

- The possible interactions between Rabeprazole sodium and distinct polymers were investigated via FT-IR studies. Results proved that the drug was found to be compatible with excipients as wave numbers are almost similar for pure drug as well as drug excipients mixture.
- All the formulated matrix tablets of Rabeprazole were mainly prepared by using different polymers like HPMC-E15, Carbopol934, sodium CMC either alone or in combination.
- The matrix tablet mainly fabricated using wet granulation method. As such all the formulated matrix tablets were of good quality respect to size, hardness, and drug content.

Zero order and higuchi release for the following formulations

Time	√T	% Cumulative amount of drug release					
		Formulation code					
		F1	F2	F3	F4	F5	F6
1	1	20.66	17.60	19.50	13.19	20.95	15.80
2	1.414	35.80	21.32	31.92	20.21	32.93	31.15
3	1.732	45.11	37.90	39.55	27.10	43.40	44.40
4	2	51.23	46.20	47.42	36.37	56.35	47.50
5	2.236	65.5	52.40	55.45	43.50	67.66	62
6	2.449	70.4	63.30	62.35	54.60	73.835	65.55
7	2.645	80.51	69.80	69.87	61.40	82.321	74.5
8	2.828	85.36	80.30	74.35	69.65	83.651	80.80
9	3	89.40	88.15	81.65	77.40	88.162	85.40
10	3.162	93.62	92.35	88.38	84.60	91.425	87.85

Table 5

First order drug release for following formulations

Time	% ARA					
	F1	F2	F3	F4	F5	F6
1	1.89	1.91	1.90	1.93	1.89	1.92
2	1.80	1.89	1.83	1.90	1.82	1.83
3	1.73	1.79	1.78	1.86	1.75	1.74
4	1.68	1.73	1.72	1.80	1.63	1.72
5	1.54	1.67	1.64	1.77	1.50	1.57
6	1.47	1.56	1.57	1.65	1.41	1.53
7	1.46	1.48	1.47	1.58	1.24	1.40
8	1.16	1.29	1.40	1.48	1.21	1.28
9	1.02	1.07	1.26	1.35	1.07	1.16
10	0.80	0.88	1.06	1.18	0.93	1.08

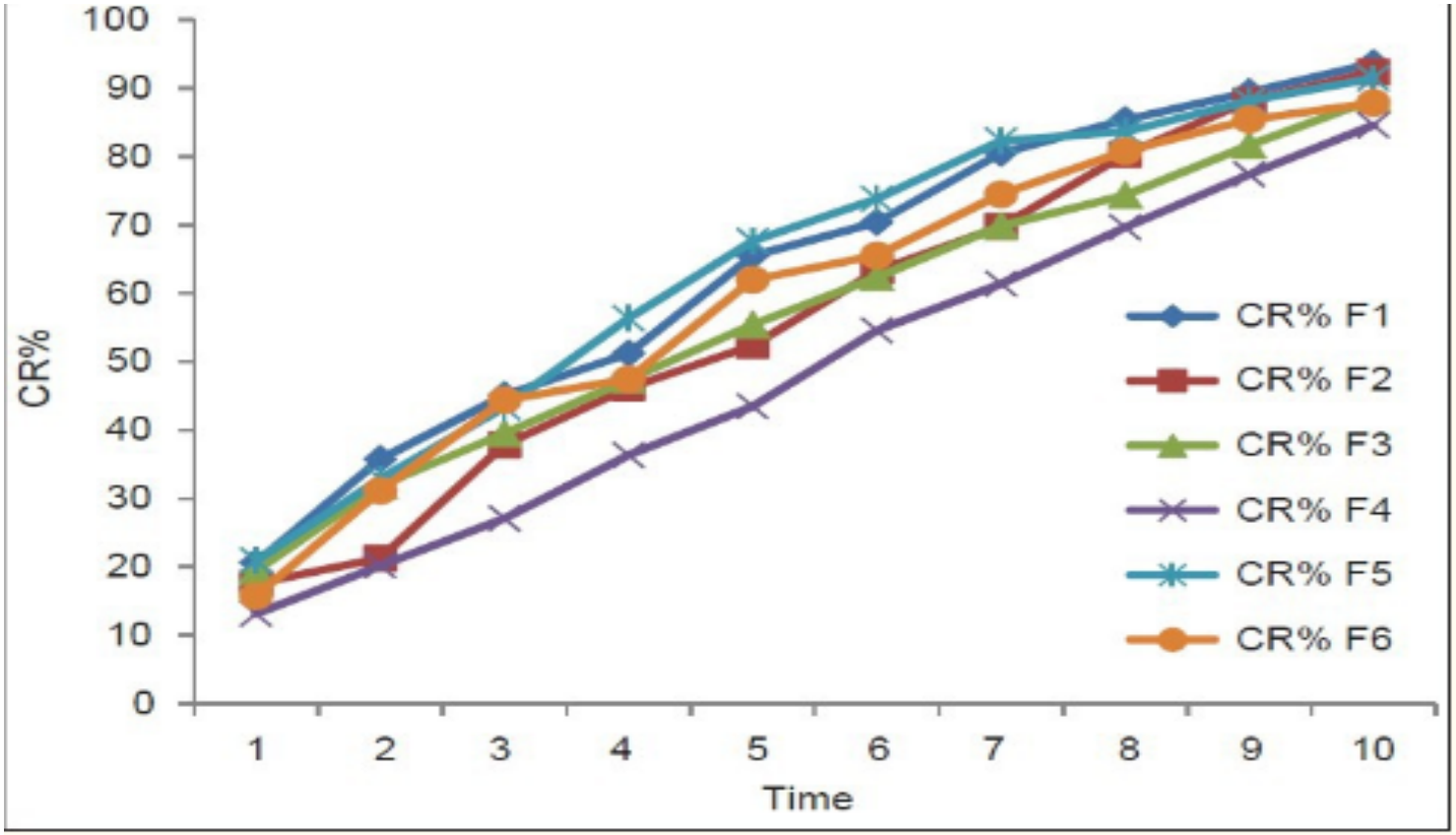

Figure 2

Zero order release

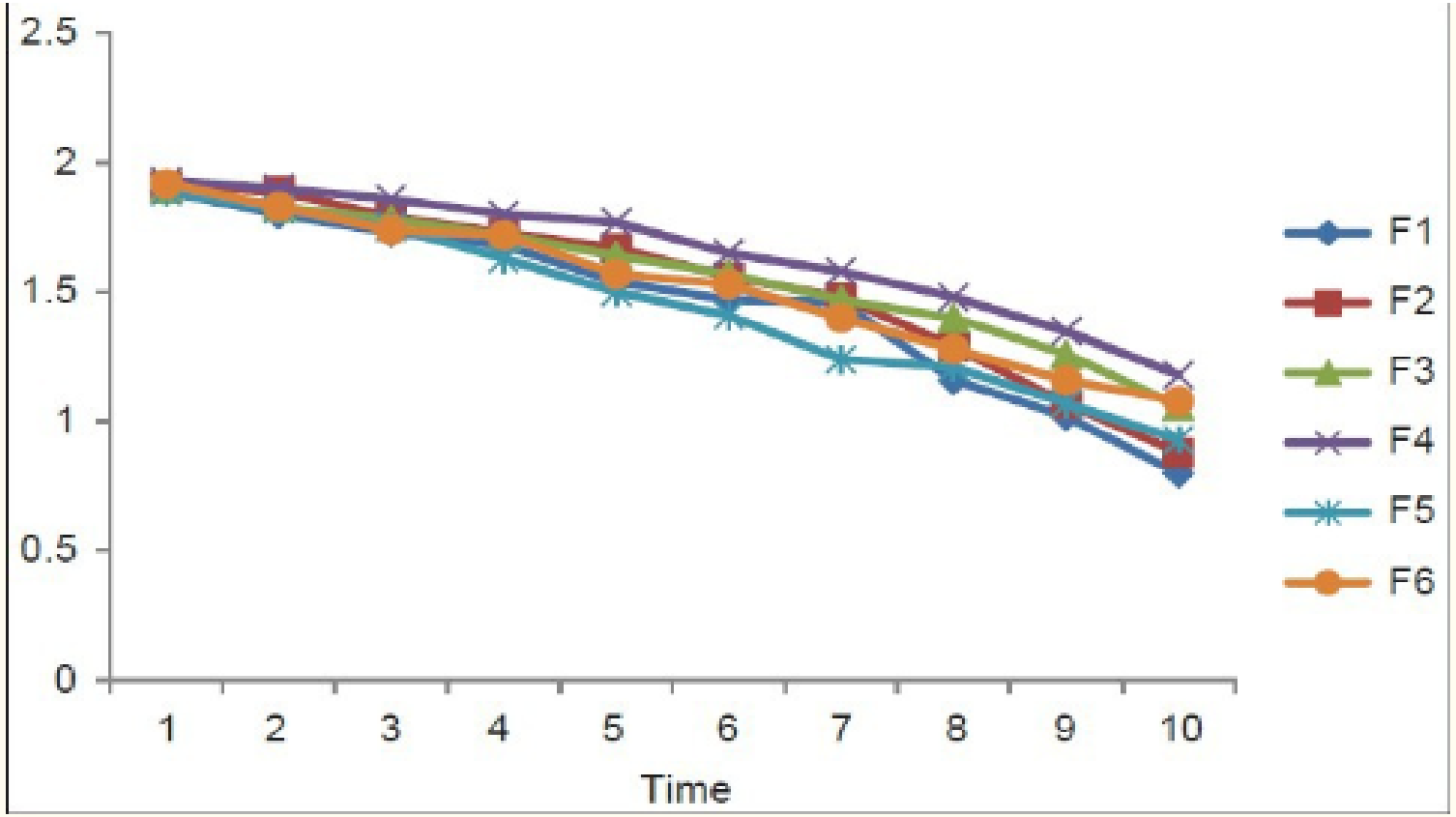

Figure 3

First order release

Conclusion

- In our study, our observation shows that the Rabeprazole matrix tablet extends the release rate of drug for a prolong period of time at least 10 hrs and shows to increase the bioavailability and simultaneously decrease the dosing interval as well as dosing amount.
- The formulation minimizes the blood level oscillations, dose related adverse effects and cost and ultimately improve the patient compliance and drug efficiency.

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PHARM D RESEARCH PROJECT

A STUDY ON ANTIMICROBIAL STEWARDSHIP AMONG IN-PATIENTS OF A TERTIARY CARE TEACHING HOSPITAL

Project Submitted to

RAJIV GANDHI UNIVERSITY OF HEALTH SCIENCES,
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In partial fulfilment of the requirement for the degree of

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STUDY OF RATIONAL PRESCRIBING PATTERN AND DRUG MANAGEMENT FOR GERIATRIC PATIENTS IN A TERTIARY CARE HOSPITAL

5[III] PHARM D Project Submitted to

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In partial fulfillment of the degree of

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TO EVALUATE THE DRUG UTILIZATION PATTERN AND PHARMACOECONOMICS ON ACUTE CORONARY SYNDROME IN A TERTIARY CARE HOSPITAL

5TH PHARM-D Project submitted to

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DRUG UTILIZATION EVAULATION OF ANALGESICS AMONG INPATIENT OF TERTIARY CARE HOSPITAL

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6/12/21

EVALUATION OF DRUG UTILIZATION PATTERN IN THE MANAGEMENT OF PREGNANCY COMPLICATIONS IN A TERTIARY CARE HOSPITAL

A project work submitted to

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06/12/21

6/12/21

A STUDY ON THE RATIONALE USE, PRESCRIBING PATTERN AND PHARMACOECONOMICS OF BENZODIAZEPENES USED IN PSYCHIATRY DISORDERS IN A TERTIARY CARE HOSPITAL.

5th PHARM D Dissertation Submitted to

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