CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.2656643

Available online at: http://www.iajps.com Research Article

PREPARATION AND EVALUATION OF TAPENTADOL MOUTH DISSOLVING TABLETS

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Article Received: February 2019 **Accepted:** March 2019 **Published:** April 2019

Abstract:
Mouth dissolving tablets are solid dosage forms containing tapentadol as active pharmaceutical ingredient which has analgesic effect, and has superdistegrants like croscarmellose sodium and starch glycolate which disintegrates fast usually less than 60 seconds without the need of water when placed on the tongue. To prepare and evaluate tapentadol mouth dissolving tablet by using direct compression method and to determine the effect of formulation process and the excipients. Tapentadol MDT were formulated by using ingredients and superdisintegrants like sodium starch glycolate and cross carmellose.The resulting tablets were evaluated using parameters such as: hardness, friability, disintegration time in vitro, modified disintegration time, disintegration time in the oral cavity, wetting time, water absorption ratio, drug content determination, weight uniformity, and dissolution. The results showed that tapentadol mouth dissolving Tablets fulfilled the requirements for all parameters except for F1 formula that did not produce physical shape intact tablet. MDT s used higher amount of crosscarmellose showed faster disintegration time. FTIR studies and calibration curve show there is interaction between drug and excipients tablet hardness were also higher. In vitro drug release of all formulation MDTS showed fast drug release with in few sec. The study reveals that formulations prepared by direct compression F3 exhibits highest dissolution using cross carmallose sodium showed faster drug release 90.15% over the period of 50min while disintegration time of the tablet was showed 50sec in comparison to other formulations of tapentadol.

Keywords: *sodium starch glycolate,crosscarmellose sodium, disintegration tapentadol mouth dissolving tablets.*

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QR code

Please cite this article in press Shiva Kumar et al., ***Preparation and Evaluation of Tapentadol Mouth Dissolving Tablets.,*** *Indo Am. J. P. Sci, 2019; 06(04).*

PRINCIPAL
Geethanjali College of Pharmacy
Cheeryal(V), Keesara(M), Medchal Dist. T.S.-501301.

ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 12, Issue 2, 2019

Online - 2455-3891
Print - 0974-2441

Research Article

FORMULATION AND EVALUATION OF GEL LOADED WITH MICROSPHERES OF APREMILAST FOR TRANSDERMAL DELIVERY SYSTEM

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Received: 29 August 2018, Revised and Accepted: 09 November 2018

ABSTRACT

Objective: The main objective of the present research work was to formulate and evaluate gel loaded with microspheres of apremilast to increase bioavailability and to reduce the dosing frequency and to improve patient compliance.

Methods: Gel loaded with microspheres of apremilast was prepared by solvent evaporation method by taking different ratios of polymers. Ethyl cellulose as a polymer, dichloromethane solvent is used as drug solubility, polyvinyl alcohol as a surfactant, and sodium alginate is used as gelling agent. Prepared gel loaded with microspheres was evaluated for drug interactions by Fourier transform infrared (FTIR), differential scanning calorimetry studies, and surface morphology by scanning electron microscopy (SEM), to select effective one among all formulations. The prepared formulations (F1–F6) were evaluated for pre-formulation studies, spreadability, viscosity, pH measurement, gel strength, homogeneity, drug content, *in vitro* diffusion studies, drug kinetics, and finally for stability studies.

Results: Differential scanning calorimeter studies confirmed that there is no drug interaction between drug and excipients. FTIR spectroscopy studies confirmed that there is compatibility between drug and excipients. Regular and spherical shape particles with smooth surface were observed in the SEM photographs. The optimized gel loaded with microspheres of F4 formulation (drug: polymer in 1:4 ratio) is more effective compared to all formulations. The prepared gel showed acceptable physical properties such as spreadability (5.86±0.54 g.cm/s), viscosity (568 cps), pH (6.33±0.55), gel strength (38 s) and drug content (90.00±0.71%). In vitro diffusion studies have shown 80.1±1.92% drug release in 10 h. Drug kinetics follows zero order kinetics and n value was found to be 0.721. Stability studies were done for 3 months.

Conclusion: All the results show that the gel loaded with microspheres of apremilast can be effectively used for the treatment of psoriasis and psoriatic arthritis.

Keywords: Apremilast, Dichloromethane, Ethylcellulose, Gel loaded with microspheres, Polyvinyl alcohol, Sodium alginate.

 DOI: http://dx.doi.org/10.22159/ajpcr.2019.v12i2.29374

INTRODUCTION

Psoriasis and psoriatic arthritis are a chronic skin disease of autoimmune system that is identified as patches of abnormal skin [1]. Apremilast inhibits the enzyme phosphodiesterase 4 which leads to spontaneous inhibition of tumor necrosis factor-alpha production from human rheumatoid synovial cell [2]. In addition, the application of oral drug delivery has numerous problems such as abdominal pains, upper respiratory, nasopharyngitis, and depression that often ends in lack of patient compliance [3]. Drugs that are not soluble in water can be entrapped in microsponge pores, which are extremely small, thus the drug functions as microscopic particles, producing a greater surface area and increasing the rate of solubilization [4].

Microspheres defined as solid spherical particles, approximately the size ranges from 1 to 1000 μm containing dispersed drug molecules either in solution or crystalline forms [5]. They are shallow spherical, free-flowing powders consisting of proteins polymers or synthetic polymers which are biodegradable in nature [6].

Microspheres are a polymeric matrix system which contains the drug in a state of uniform distribution throughout the matrix. Polymers such as ethyl cellulose are used for the preparation of matrix-type microspheres of water-soluble drugs to control the dissolution rate of drugs from the dosage forms [7]. Transdermal gels are a semisolid system, they prepared from a liquid which is thickened with other ingredients. The drug release through skin membrane and preparation of gelling agent sodium alginate is used [8]. The present work is to increase bioavailability and reduce the dosing frequency and improve patient compliance by designing formulation and evaluation of gel loaded with microspheres of apremilast for treating psoriasis and psoriatic arthritis.

MATERIALS AND METHODS

Materials

Apremilast (Gift sample by Alembic Pharmaceuticals Limited, Vadodara, India), It is a water-insoluble drug, so it is chosen as a main drug. Ethyl cellulose was used as a polymer (Qualikems Fine Chem Pvt., Ltd.). Polyvinyl alcohol is used as a surfactant (Qualikems Fine Chem Pvt., Ltd., Vadodara, India). Sodium alginate is used as a gelling agent (NR Chem, Mumbai). Dichloromethane is used as drug solubility (Qualikems Fine Chem Pvt., Ltd.).

Methods

Formulation of gel loaded with microsphere

Preparation of apremilast microspheres

Using solvent evaporation method, apremilast microspheres were prepared. By taking ethyl cellulose as a polymer and solution of dichloromethane solvent were used with combination to get perfect dissolution of drug in it. Initially, formulation was developed to select a best-suited solvent system for selected solvent evaporation method. The drug and polymer ratio concentration was remained constant for the formulation F1–F6. Desired quantity of ethyl cellulose polymer was dissolved in 10 ml dichloromethane solvent. Calculated drug was added

RESEARCH ARTICLE

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Formulation and Evaluation of Gastroretentive Floating Microspheres of Nicardipine

Shiva Kumar Yellanki[1]*, M Naga Prashanthi [1], M Ravi Kumar[1]

Abstract: The present study was aimed at development of gastroretentive floating microspheres of nicardipine for controlled release and to develop innovative and suitable dosage form by the use of various polymers. Nicardipine is an antihypertensive drug it is a dihydropyridine calcium-channel blocking agent used to treat the vascular disorders such as chronic stable angina, hypertension. Different floating microspheres formulations were prepared using different polymers like locust bean gum, gellan gum, Eudragit S 100, Eudragit L 100, sodium alginate in various combination ratios by ionotropic gelation method. All the developed formulations were subjected to various evaluation parameters such as particle size, micromeritic study, percentage yield, drug entrapment efficiency, *in-vitro* buoyancy, swelling index, floating behaviour, *in-vitro* drug release scanning electron microscopy (SEM) and stability studies. Optimized formulation was decided based on drug release studies, buoyancy studies, percentage yield, gastro retention time, swelling index, zero order, first order, Higuchi model, korsmeyer peppas model. Formulation containing sodium alginate and locust bean gum in combination (F3) exhibited maximum drug release of 97.33% for 12 hrs and scanning electron microscopy (SEM) revealed smooth surface characteristics with less particle size and good flow properties hence it was confirmed as the optimized formulation.

INTRODUCTION

Microspheres are small spherical particles with diameter of 1-200 µm which have gained great attention due to their free flowing powder characteristics and biodegradable nature generally made up of natural or synthetic polymeric materials. As microspheres are made up of small particle size less than 200 µm the drug absorption and side effects due to irritating drugs against the gastrointestinal mucosa is improved and they are widely distributed throughout the gastrointestinal tract. [1-3]

Floating microspheres are low density systems remains buoyant in gastric content for prolonged period of time. Variations in gastric emptying rates of conventional dosage forms can be reduced by these systems due to prolongation of gastric retention time of dosage forms. In addition to this drug is released slowly and constantly at desired rate from the floating microspheres. There is reduction in plasma concentration fluctuations due to low density of microspheres and remain floated in gastric content. These systems also minimize the dose discharge and provide extend and controlled therapeutic effects. [4, 5]

In the present work an attempt was made to formulate floating microspheres of anti-hypertensive drugs for hypertension and angina pectoris, hence it is necessary to develop the formulation which will provide the sustained release of the drug there by reducing the dose of the drug.

MATERIALS AND METHODS

Nicardipine procured from Hetero Labs, Mahaboobnagar, Telangana, India. Locust Bean Gum, Gellan Gum, Eudragit S-100, Sodium Alginate and Other Chemicals were purchased from SD Fine Chemical, Mumbai, India. All solvents used were of analytical grade.

Fourier Transform Infrared Spectroscopy

FT-IR spectra for nicardipine and polymers were recorded using a fourier transform infrared spectrophotometer. The analysis is carried out in shimadzu-IR affinity spectrophotometer. The samples were dispersed alone or in combination in potassium bromide (KBr) and placed in the light path for recording IR spectra. The scanning range for IR was 400-4000 cm^{-1} and the resolution was 1 cm^{-1}.

Differential Scanning Calorimetry (DSC)

Differential scanning calorimetry studies were carried out using DSC 60, having TA60 software, shimadzu, Japan. Samples are accurately weighed and heated in sealed aluminum pans at a rate of 10°C/min between 25°C to 350°C temperature range under nitrogen atmosphere, aluminum pan are used as a reference. [6, 7]

Preparation of Floating Microspheres by Ionotropic Gelation method

Nicardipine Floating microspheres are prepared by using different polymers like Locust bean gum, gellan gum, Eudragit S-100, Eudragit L-100 and sodium alginate by ionotropic gelation method which involved reaction between sodium alginate and calcium chloride to produce a hydrogel network of calcium alginate. Accurately weighed ratio of polymers is added to the distilled water (10 ml) to form a homogenous polymer mixture by using magnetic stirrer. Nicardipine (100 mg) were added to the polymer mixer and mixed thoroughly with a stirrer to form a viscous dispersion. Sodium bi carbonate which acts as floating agent is added to the drug and polymer mixer and stirred. The above mixer is then added drop wise into calcium chloride (5%) solution through a 22G needle with continuous stirring at 200 rpm. The droplets are kept aside for 30 minutes in calcium chloride solution to produce rigid spherical microspheres. The microspheres obtained were filtered and washed thoroughly with distilled water to remove excess calcium chloride deposited on the surface of microspheres and then dried at room temperature. Same procedures were repeated for all other formulations. In this study, twelve formulations were prepared by different

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2019 ppt 27172 © Inventi Journals (P) Ltd
Published on Web 10/01/2019, www.inventi.in

Global Journal of
Pharmacy & Pharmaceutical Sciences
ISSN: 2573-2250

Juniper Publishers
key to the Researchers

Research Article
Volume 6 Issue 5 - December 2018
DOI: 10.19080/GJPPS.2018.06.555697

Glob J Pharmaceu Sci

Development and Validation of A RP- HPLC Method for the Simultaneous Estimation of Valsartan and Sacubitril in Rat Plasma

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Submission: December 12, 2018; **Published:** December 21, 2018

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Abstract

A basic precise selective, sensitive isocratic technique was developed and valid for the quantitative synchronic estimation of Sacubitril and Valsartan drug in rat plasma was by RP- HPLC system. The chromatographic activity separation was administrated out on Intersil C18 (250 x 4.6mm, 5µm) column with a mix of acetonitrile: di-potassium hydrogen phosphate, pH 3.0 adjusted with Phosphate buffer (30:70%v/v) as mobile part. The analytes were eluted with a rate of flow of 0.8ml/min and at a wavelength of 371nm of UV detection. The strategy was valid for precision, accuracy, linearity. Limit of detection, Limit of Quantification, Ruggedness following the ICH guidelines.

The retention time was 10.725min and 15.366min and the system suitableness results was 99.95% and 100.24% for sacubitril and valsartan respectively. Linearity contemplate was completed between 100-500µg/ml and 5µg-25µg/ml, linear regression coefficient was observed to be 0.999 and the percentage recovery varies from 98-102% of Sacubitril and valsartan. No interference from any part of bulk and pharmaceutical dosage form was determined. All the parameters of validation are found to be at intervals within the vary that confirms the quality of the strategy for the determination of Sacubitril and Valsartan.

Keywords: Sacubitril; Valsartan; RP-HPLC; Method development; Validation

Introduction

High Performance Liquid Chromatography

Pittcon paper, originally indicated the proven fact that prime air mass was wont to generate the flow required for liquid natural action in packed columns. Among the beginning, pumps only had a pressure capability of 500 psi. This was known as air mass liquid natural action, or HPLC. New HPLC instruments could develop up to 6,000 psi of pressure, and incorporated improved injectors, detectors, and columns [1-6]. With continued advances in performance throughout this time (smaller particles, even higher pressure), the descriptor HPLC remained an analogous, but name was changed to high performance liquid natural action.

Reversed Phase Chromatography

Reversed phase mode is the most prevalent mode for scientific and preparative partitions of mixes of worry in biological products, pharmaceutical plans and API's, substance substances, nourishment and biomedical designing. The stationary stage is non-polar hydrophobic pressing with octyl and octadecyl useful gathering attached to silica gel and the mobile stage is a polar dissolvable, regularly a mostly or completely watery versatile stage [7-11]. Polar substances lean toward the versatile stage and elute first. Maintenance increments as the hydrophobic character of the solutes expands, by and large, the lower the extremity of the versatile stage, higher is the eluent quality.

Drug Profile

Sacubitril is chemically 4-{[(2S,4R)-1-(4-Biphenylyl)-5-ethoxy-4-methyl-5-oxo-2-pentanyl] amino}-4-oxobutanoic acid which is an antihypertensive drug used in combination with valsartan for the treatment of heart failure. Sacubitril could be a prodrug that's activated to sacubitril at (LBQ657) by de-ethylation via esterases. Sacubitril at inhibits the catalyst neprilysin, that is accountable for the degradation of chamber and brain symptom organic compound, a pair of blood pressure-lowering peptides that employment within the main by reducing blood volume. Valsartan is chemically (2S)-3-methyl-2-[pentanoyl- [[4- [2-(2H-tetrazol-5- yl) phenyl] phenyl] methyl] amino] butanoic acid. Valsartan is Associate in Nursing man of affairs that by selection inhibits the binding of Hypertensin to AT1, that's is found in several tissues like tube-shaped structure sleek muscle and in addition the adrenal glands [8-12].

This effectively inhibits the AT1-mediated agent vasoconstrictive and aldosterone-secreting effects of Hypertensin and finally ends up during a decrease in tube-

International Journal of Pharmacy and Biological Sciences
ISSN: 2321-3272 (Print), ISSN: 2230-7605 (Online)
IJPBS™ | Volume 8 | Issue 4 | OCT-DEC | 2018 | 915-926
Research Article | Pharmaceutical Sciences | Open Access | MCI Approved| ज्ञान-विज्ञान विमुक्तये
|UGC Approved Journal |

PREPARATION AND *INVITRO* EVALUATION OF HIGHLY POROUS GASTRORETENTIVE FLOATING BECLOMETHASONE DIPROPIONATE TABLETS

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ABSTRACT

The present study is aimed to formulate floating gastro retentive (GR) tablets containing beclomethasone dipropionate using a sublimation material for prolongation of gastric residence time. Three different ratios of hydroxyl propyl methyl cellulose (HPMC) K4M is used in three different methods for the preparation of tablets. In this case, the drug release from tablet was highly dependent on the polymer concentrations. Camphor, the sublimation material is used in the preparation of GR tablets. Camphor changes to pores in the tablet during the sublimation process. As the camphor gets sublimed, floating properties and density of tablets were affected by the sublimation of camphor. Gastro retentive floating beclomethasone dipropionate tablets which were prepared floated for over 24 hrs and had no floating lag time. Therefore, as the concentration of camphor in the tablet matrix increases, the hardness of the tablet decreased after sublimation. Release profiles of the drug from the GR tablets were not affected by tablet density or porosity.

KEY WORDS

Beclomethasone Dipropionate, gastro retentive floating tablets, HPMCK4M, sublimation method.

INTRODUCTION

The principle and more advisable route for delivering a drug is the oral route, but in case of physiological variability like gastro intestinal transit and GRT there is a major problem. The controlled oral drug delivery of GRT is always less than 12h, and it plays a vital role in complete dosage form transit [1, 3]. These characteristics lead to evolution of a drug delivery system that retains in the stomach for a prolonged and predictable time [2].

Floating drug delivery systems (FDDS) have low bulk density than that of gastric fluids. Due to their lower densities, FDDS float above the gastric content without effecting gastric emptying rate for longer duration of time and it provides controlled release of drug [3]. These systems have been extensively used because there are no interactions in relation to the motility of the GIT and a large number of floating dosage forms commercialized and marketed worldwide. Two systems have been used in the development of FDDS, on the basis of mechanism of buoyancy. They are effervescent systems and non-effervescent system In Effervescent systems effervescent substances like carbonate/ bicarbonate salts and citric / tartaric acids are used to liberate Co_2. The liberated Co_2 is entrapped in the jellified hydrocolloid layer of the systems thus specific gravity is decreased and it is made to float above gastric content [4, 5].

In Single Layer Floating Tablets or Hydrodynamically Balanced System (HBS), Co_2 generating agents and the drug were mixed thoroughly within the matrix tablet to produce a formulation. And to remain buoyant in the stomach without effecting the gastric emptying rate for a prolonged period of time. The drug is released slowly at a desired rate [6, 8]. When the drug is completely released the system is expelled out from the stomach

International Journal of Herbal Medicine 2019; 7(1): 08-10

International Journal of Herbal Medicine
Available online at www.florajournal.com

E-ISSN: 2321-2187
P-ISSN: 2394-0514
IJHM 2019: 7(1): 08-10
Received: 06-11-2018
Accepted: 10-12-2018

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Development and evaluation of polyherbal emulgel formulation (A preventive hair care preparation)

M Ravi Kumar, Mangilal Teelavath and Shiva Kumar Yellanki

Abstract
The hair care polyherbal formulations were prepared in emulgel form by mixing the hydro alcoholic extract of four medicinal plants *Phyllanthus emblica* (*Phyllanthaceae*), *Centella asiatica* (*Apiaceae*), *Cucurbita pepo* (*Cucurbitaceae*), *Wedelia calendulacea* (*Asteraceae*), which are earlier reported to possess acclaimed hair growth promoting action. In this formulation carbopol 934 is used as gelling agent with herbal extracts. All formulations were evaluated for spreadability, viscosity, pH and Irritancy test. From the investigation, it can be concluded that the formulation of hair emulgel contain all good characters of an ideal emulgel and it was found to be harmless, more effective and economical.

Keywords: polyherbal formulation, hydroalcoholic extract, emulgel, carbopol

1. Introduction
The advantage of emugel topical delivery is to avoid first pass metabolism and avoids the risk of intravenous therapy. Topical delivery systems meant for cosmetic and skin diseases. Apart from advantages of gel, the major disadvantage is inability to deliver the hydrophobic drugs, to overcome this problem emulsion technology is recommended through gelling systems. Emugel is the water in oil or oil in water emulsion with active ingredient that incorporated in gelling agents, the system give the formulation more stability with desirable release of drugs [1, 2, 3].
The main object of present investigation to develop emugel system for hair care which consists polyherbal extract.

2. Materials and Methods
Carbopol, Span 80, Liquid paraffin, Triethanolamine, Methyl paraben, Propylene glycol, Rosemary oil, Castor oil, Lemongrass oil procured from Sisco research laboratories, Mumbai, India. Fresh fruits of *phyllanthus emblica*, leaves of *Centella asiatica*, *Wedelia calendulacea*, seeds of *cucurbita pepo* Collected from Local Area (cheeryal, Mechal Dist; Hyderabad).

2.1 Preparation of plant Extract
The fresh fruits of *phyllanthus emblica*, leaves of *Centella asiatica*, *Wedelia calendulacea*, seeds of *cucurbita pepo* were collected from nearby areas from cheeryal. The collected materials were shade dried and powdered, passed through mesh no 60, then subjected for maceration for 48 hrs with aqueous solvents. Collected powdered extracts were used for emugel preparation [4, 5].

2.2 Preparation of Emugel
Gels are transparent to opaque semi-solids containing a high ratio of solvent to gelling agent. The emulgel was formulated in three different steps [6, 7].
Step 1 Preparation of o/w emulsiuon.
Step 2 preparation of gel phase.
Step 3 Involves incorporation of emulsion into gel base with continuous stirring.

Gel was prepared by using various ratios carbopol 934 in queous solvent and stirring is applies on magenetic stirrer. Triethanolamine is added to maintain pH of all formulations. Oil phase is prepared by dossolvin span 80 in liquid paraffin and queous phase with extract in aqueous solvent. Methyl paraben was added as preservatiove. Oil and aqueous phases were preheated separately at 70^{0}C to 80^{0}C and both were mixed together and applied stirring until its get cool and gel formation.

EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 5
Issue: 9
465-471
Year: 2018

PREPARATION AND EVALUATION OF RIZATRIPTAN SUBLINGUAL TABLETS BY USING SUPERDISINTEGRANTS

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Article Received on 15/07/2018 **Article Revised on 06/08/2018** **Article Accepted on 27/08/2018**

ABSTARCT
The present aim of study is to formulate and evaluate Sublingual tablets of Rizatriptan. Super disintegrating agents like Sodium starch glycolate, Gellan gum, and Croscarmellose sodium were employed has to increase the solubility and dissolution rate of the Rizatriptan drug molecule. Formulation of sublingual tablets was carried out by using direct compression method in 8 station rotary punching machine with a 6mm punch for all formulations. The mixture of nine formulations was passed Pre-compression and Post-compression parameters and they passed all the quality control parameters as per IP limits. The FTIR and DSC studies were analyzed for compatibility studies. The F4 formulation was considered as the optimized formulation as it shown maximum amount of release of drug was found to be 99.16% in 8 min. Gellan gum as a super disintegrant shown maximum drug release in the concentration of 10mg in F4 formulation.

KEYWORDS: Rizatriptan, Croscarmellose Sodium, Gellan Gum and Sodium Starch Glycolate.

1. INTRODUCTION

Sublingual administration of drugs shows the fast onset of action is carryout as compared to oral route. The retention time of sublingual medication is three to ten times greater than the oral route and is just passed by the hypodermic infusion method. Sublingual route has several advantages over the avoidance of first-pass metabolism, progressed patient compliance and ease of self-medication. This course has particular points of interest over the enteral and parenteral course of medication because of its high blood supply, the onset of action and improved bioavailability into the systemic circulation.[1] Various components like pH, molecular weight, and lipid solubility may exploit this technique. From these properties, a solvent medication may disperse too gradually through the mucosa to be dynamic. The sublingual glands are also considered as salivary glands which produce the mucin and helps in the fabrication of saliva, required for the breakdown of particles. These glands present in the lining of the oral cavity that is below the tongue. This also provides slippery that helps in chewing and swallowing the food. The amount of drug that reaches into the systemic circulation from the site of administration is directly proportional to membrane thickness. It is expressed in the following order Sublingual>buccal>gingival>palatal.[2]

Because of greater permeation and high blood supply, this release rapid onset of action and instant dosing regimen with less delivery period of drugs with the sublingual route. Sublingual means "under the tongue". It is considered to a method of placing drug via mouth so that the drug highly absorbed through blood vessels below the tongue more than digestive track. The sublingually administered drug pharmacologically activates in 1 – 2 minutes which is effectively impressed in this route. Some of the drugs which are administered through the sublingual route are Steroids, barbiturates, cardiovascular drugs, and enzymes. This administered drug directly reaches to nutritional benefits which avoid subject to gastric system and liver.[3]

1.1 Factors Affecting the Sublingual Absorption.[4,5]

1. Solubility in Salivary Secretion
2. Binding to Oral Mucosa
3. pH and pKa of The Saliva
4. Lipophilicity of Drug
5. Thickness of Oral Epithelium.

Rizatriptan is a selective 5-HT 1B/1D agonist receptors have week affinity towards 5-HT1A, 5-HT5A AND 5-HT7 receptors and there is no pharmacological activity for 5-HT2, 5-HT3 OR 5-HT4 receptor subtypes. It helps to relieve a headache, pain, and other migraine symptoms including nausea, vomiting, sensitivity to light/sound. The migraines can be easily treated to return your normal routine and decreases the pain medications.

RESEARCH ARTICLE

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Formulation and Evaluation of Buccal Mucoadhesive Patches for the Treatment of Hypertension

Shiva Kumar Yellanki[1]*, Uday Kumar K[1], Teelavath Mangilal[1], M Ravi Kumar[1]

Abstract: Nimodipine is dihydropyridine calcium channel blocker, generally used for the treatment of high blood pressure. It has shown the good results in preventing major issues of subarachnoid hemorrhage (a form of cerebral hemorrhage) termed vasospasm; this is currently the main use of nimodipine. In the present study buccal drug delivery of nimodipine was developed. Matrix type of buccal patches was developed by using polymers HPMC K4M, HPMC K15M and HPMC K100M, sodium alginate and PVP K 30. Buccal patches were formulated by employing solvent casting method. Drug and excipient compatibility studies were implemented by using FTIR, DSC and no interaction was observed. Formulations were prepared with the different concentrations of polymers from the F1-F9, all the formulated patches were evaluated for the various physical parameters like physical appearance, flatness, thickness, weight variation, drug content, moisture absorption, moisture loss, swelling study, folding endurance and all the results were obtained within the pharmacopeial limits. In *in-vitro* drug release studies by using dialysis membrane, among all the 9 formulations F7 formulation which contain HPMC K100M 175 mg had shown 97.57% cumulative drug release within 12 hours. For F7 formulation release kinetics was plotted and the regression coefficient value was found to be high for Pappas release model was 0.991.

INTRODUCTION

The buccal mucosa provides readily accessible route for transmucosal delivery. Absorption through the buccal mucosa overcomes the early degradation of drug due to the pH of the gastro intestinal tract and enzyme activity and avoids active drug loss due to acid hydrolysis, presystemic metabolism, therapeutic plasma concentration of the drug can be rapidly achieved. The adhesive properties of such drug delivery platforms can reduce the enzymatic degradation due to the increased affinity between the delivery vehicle and the absorbing membrane. It has also been used as pharmaceutical excipients in conventional dosage forms as well as in novel applications involving bioadhesion and transmucosal drug transport. [1]

Transmucosal routes of drug delivery offer distinct advantages over per oral administration for systemic drug delivery. [2] These advantages include possible bypass of first pass effect, avoidance of presystemic elimination within the GI tract and depending on the drug, better enzymatic flora for drug absorption. [3]

Therefore, in the present study an attempt was made to formulate and evaluate nimodipine buccal mucoadhesive patches using various polymers.

MATERIALS AND METHODS

Nimodipine was supplied by NATCO pharmaceuticals, Hyderabad. HPMC K4M and HPMC K15M were purchased from Merck Specialities Pvt Ltd., Mumbai and all other materials were procured from S D Fine Chemical Ltd., Mumbai. All solvents used were of analytical grade.

Drug-Excipients Compatibility Studies

FT-IR spectroscopy was determined to find any physical and chemical interaction between the drug and other excipients used in the dosage form. FTIR spectrum was performed for the pure nimodipine powder and the optimized formulation. Samples were mixed with the KBr then pressed to form the disc. Then this disc was investigated using FTIR spectroscopy in the range 4000-400 cm^{-1}. [4] It is the leading thermal analysis technique. It is supposed that the thermal properties (melting point, change in enthalpy, etc.) of the individual components are compatible with each other. DSC scans were employed for the pure nimodipine powder and physical mixture of the drug and polymers (optimized formulation) of nimodipine buccal patch. The test was carried out by using a Shimadzu DSC apparatus with temperature range 50-300 and in a rate 10/min. DSC stands to benefit over other conventional techniques in requirement of short time of analysis and low sample consumption. [5]

Development of Buccal Patches

Buccal drug delivery patches were prepared by solvent casting method. HPMC K4M, HPMC K15M and HPMC K100M were weighed in requisite ratios and they were then dissolved in distill water as solvent using magnetic stirrer. Nimodipine (175 mg), Sodium alginate requisite and Poly ethylene glycol was added to the above dispersion under continuous stirring. The uniform dispersion was poured in the petri plate. The rate of evaporation of solvent was controlled by inverting cut funnel over the patches.

Total area of the petri dish was = 69.4 cm^2
Drug require in (2×2cm^2) = 10 mg
So total drug loaded = 175 mg.

Evaluation of Patches

1. Physical Appearance

This test includes visual examination of the patches. [6]

2. Thickness

Three patches are randomly selected from the each formulation of different batches. And then the thickness of each patch was measured by screw gauge. [7]

3. Weight Variation

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CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.1251171

Available online at: http://www.iajps.com Research Article

FORMULATIONANDEVALUATIONOFVORICONAZOLE BUCCAL PATCHES BY USING SELECTED POLYMERS

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Abstract:

The aim of the present study is to formulate and evaluate Voriconazole Buccal Patches. Voriconazole is a triazole antifungal drug that is generally used to treat serious, invasive fungal infections. These are generally seen in patients who are immune compromised, and include invasive candidiasis, invasive aspergillosis, and certain emerging fungal infections. In the present study buccal drug delivery of Voriconazole was developed Matrix type of buccal patches was developed by using polymers such as Chitosan and Eudragit S 100. Buccal patches were prepared by employing solvent casting method. Propylene glycol and Tween80 were selected as both permeation enhancer and plasticizer. Drug excipient compatibility studies were carried out by using FTIR, and it was observed that there were no interactions between drug and polymers. Formulations were prepared by the varying concentrations polymers ranging from F1-F6, and all the formulations were evaluated for various physical parameters such as Physical appearance, Flatness, Weight variation, Thickness, Folding endurance, Drug content, Moisture uptake, Moisture content. All the results were found to be were found to be within the pharmacoepial limits, invitro drug release studies done by using dialysis membrane. Among all the 06 formulations F4 formulation which contain Eudragit S 100 100mg has shown 95.76% cumulative drug release within 12 hours. For F4 formulation release kinetics were plotted and the Regression coefficient value was found to be high for Korsemeyer Peppas model plot i.e., 0.999.

Key words: *Voriconazole, Buccal Patches, Chitosan and Eudragit S 100*

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Please cite this article in press K.Chitra et al., ***Formulationandevaluationofvoriconazole Buccal patches By Using Selected Polymers,*** *Indo Am. J. P. Sci, 2018; 05(05).*

PRINCIPAL
Geethanjali College of Pharmacy
Cheeryal(V), Keesara(M), Medchal Dist. T.S.-501301.

CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.2525362

Available online at: http://www.iajps.com Research Article

DEVELOPMENT AND VALIDATION OF A RP- HPLC METHOD FOR THE BIO-ANALYSIS OF OXCARBAZEPINE IN RAT PLASMA

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Abstract

A new plan was fixed for estimation of Oxcarbazepine by RP-HPLC method. The chromatographic actions continue strongly grow for the break of Oxcarbazepine by applying Agilent C18 column (4.6×150mm) 5u, flow rate was 1.0 ml/min, mobile phase ratio was IN- potassium hydrogen phosphate: ACN (70:30% v/v) detection wavelength was 293nm. The instrument used was WATERS HPLC Auto Sampler, Separation module 2695, photo diode array detector 996, Empower-software version-2. The confinements times continue begin to be 2.954mins. The % pureness containing Oxcarbazepine was begin to be 99.87%.The system fitness parameters for Oxcarbazepine such as theoretical plates also tracking component were begin to be 4600, 1.2. The analytic plan was approve in agreement with ICH protocol (ICH, Q2 (R1)). The linearity study of Oxcarbazepine act begin in absorption area of 20µg-100µg and correlation coefficient (r^2) was begin to be 0.999, % recovery was begin to be 100.56%, %RSD for repeatability was 0.17, % RSD for transitional precision was 0.10. The precision study was precision, robustness also repeatability, LOD value was 0.303 and LOQ value was 1.011.

Keywords: *Agilent C18, Oxcarbazepine, RP-HPLC, and Rat plasma.*

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QR code

Please cite this article in press N. Anjaneyulu et al., Development And Validation Of A Rp- Hplc Method For The Bio-Analysis Of Oxcarbazepine In Rat Plasma., Indo Am. J. P. Sci, 2018; 05(12).

IJBPAS, September, 2018, 7(9): 1746-1757

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

FORMULATION AND EVALUATION OF CLOPIDOGREL BISULFATE PROLIPOSOMES

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Received 27th March. 2018; Revised 14th April 2018; Accepted 19th May 2018; Available online 1st Sept. 2018

https://doi.org/10.31032/IJBPAS/2018/7.9.4537

ABSTRACT

The objective of present work is to develop proliposomes of Clopidogrel bisulfate, to increase the bioavailability, increase aqueous solubility and to decrease the side effects like gastric bleeding. Proliposomes are prepared by Film deposition on carrier method using sorbitol as carrier powder. Lecithin and cholesterol were used as lipid phase and Clopidogrel bisulphate as drug. The results have shown no interaction between the drug and polymer through FTIR studies. Clopidogrel proliposomes with good flowability were obtained. The particle size of the proliposomes was from 20 -3 µm from scanning electron microscope photographs. Percent drug content and Percent drug entrapment efficiency of optimized formulation was found to be 82.6% and 75.6%.The *invitro* percent drug release of optimized F4 formulation has showed 88.65 % at 10 hours. Stability studies show that the formulation was stable at 40°C and at 75% RH. Proliposomes exhibited better stability when compared with liposomes. Clopidogrel bisulfate proliposomes with good flowability and sustained released characteristics can be obtained by controlling drug and lecithin concentration. Proliposomes prove to be efficient drug carriers for sustained drug delivery of Clopidogrel bisulfate.

Keywords: Proliposomes, Clopidogrel bisulfate, lecithin, sorbitol *and in-vitro* release.

Chemico-Biological Interactions 308 (2019) 120–129

Contents lists available at ScienceDirect

Chemico-Biological Interactions

journal homepage: www.elsevier.com/locate/chembioint

Zolmitriptan attenuates hepatocellular carcinoma via activation of caspase mediated apoptosis

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ARTICLE INFO

Keywords:
Zolmitriptan
Hepatocellular carcinoma
Mitochondrial apoptosis
^{1}H-NMR based metabolomics

ABSTRACT

A preclinical study using DEN-induced HCC rat model was attempted to evaluate the antitumor potential of zolmitriptan (ZOL). The molecular insights were investigated using ELISA, qRT-PCR and Western blot techniques. The result confirmed that the HCC condition was developed in response to lower expressions of caspase 3 and 9 which, in turn, was due to the upstream regulation of iNOS, Bcl-xl and Bcl-2, and downstream regulation of eNOS, BAX, BAD and Cyt C. The treatment with ZOL caused the significant activation of caspase mediated apoptotic signals that could be responsible for its anti-HCC potential. Later, ^{1}H NMR based serum metabolomics study confirmed that ZOL restored the perturbed metabolites associated with DEN-induced HCC. The anti-neoplastic potential of ZOL was found comparable or to some degree better than the marketed chemotherapeutics, 5-flurouracil.

1. Introduction

Hepatocellular carcinoma (HCC) is the third most common cause of cancer worldwide [1] and around 600,000 people are enlisted for death every year [2]. The lack of treatment option may be due to unexplored clear-cut mechanism of HCC. This fact encouraged the researchers to prepare newer therapeutics for HCC treatment [2]. Sorafenib, a tyrosine kinase inhibitor, is only the drug of choice for HCC treatment [3], however, most of the patients treated with sorafenib experience severe diseases related to metastasis and resistance [4]. In addition, it has significant adverse effect and the economic cost is very high [5]. Thus, it is necessary to search newer drugs for improved HCC treatment.

Zolmitriptan (ZOL), a well-known activator of 5HT1B and 5HT1D receptors, releases substance P at the receptor sites [6]. A recent investigation suggested that substance P binds with neurokinin 1 and regulates cell proliferation, neoangiogenesis and metastasis at the tumor sites particularly for pancreatic cancer [7,8]. Further, substance P is over-expressed at hepatic site and produces similar action, described in previous line [8]. Inspired by the aforementioned fact, we speculated that ZOL could be an effective agent for the treatment of HCC.

Reports have been documented that chronic liver inflammation as well as inhibition in apoptosis plays a decisive role in the development of HCC. Further evidence suggested that the carcinogenic action of diethylnitrosamine (DEN) is clearly associated to produce HCC in liver tissue [9]. Thus, to evaluate the anti-HCC action of ZOL and to confirm the molecular mechanism underlying its action, we performed *in vivo* experiment in DEN-induced HCC rat model. The tissue concentration of the important inflammatory mediators (IL-2, IL-6, IL-10 and IL-1β) and apoptotic markers (Caspase 3 and 9) were measured using ELISA. Interestingly, treatment with ZOL offered a significant activation of apoptotic markers (Caspase 3 and 9) without any significant alteration

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https://doi.org/10.1016/j.cbi.2019.05.033
Received 10 October 2018; Received in revised form 23 April 2019; Accepted 20 May 2019
Available online 23 May 2019
0009-2797/

Formulations and *In Vivo* Evaluation Studies of Buccal Adhesive Ranolazine Tablets Using Natural Edible Mucoadhesives

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ABSTRACT:** The amount of Ranolazine that permeated through the buccal mucosa at defined intervals in a period of four hours was estimated spectrophotometrically. The permeation was similar to the in vitro dissolution studies in most cases and the amount permeated is slightly less than the actual amount of drug dissolved at the similar conditions. Pharmacokinetic parameters of Ranolazine were studied for optimized NBAT formulations, i.v. bolus injection and orally administered core tablets of same batch of NBATs on anaesthetized male New Zealand albino rabbits. Plasma concentration profiles in anesthetized rabbits after the administration of Ranolazine through intravenous, oral and Novel Buccal Adhesive Tablets. Plasma concentration of Ranolazine declined to less than the minimum effective concentration in about 2.5 hours after intravenous administration. Conversely, in oral tablets and NBATs at the same dose MEC was reached after 0.5-1.0 and 1.0-2.0 respectively and remained above the desired level till 2-2.5 and 4-5 hours respectively. Time to reach maximum concentration (T max) for NBAT was 3 - 4 hours whereas it was 1 - 1.5 hour on oral administration. Maximum plasma concentration (C max) for oral (46.9 - 58.9) was found to be less than the NBATs (57.1 - 73.6). The AUC values for after iv administration was 437.53 ± 24.36 (hr)*(ng/ml). On oral administration, the F (bioavailability) values were found to be 0.384±0.36*, 0.367± 0.6**, 0.411±0.1* and 0.353±0.06*respectively for NBAT 3, NBAT 7, NBAT 11 and NBAT 15. Same formulations on buccal administration yielded F values of 0.794±0.09*, 0.766±0.09**, 0.839±0.09**, and 0.744± 0.08** respectively.

***Keywords:** Mucilages of plant, Ranolazine, Mucoadhesive polymers, sodium alginate and guar gum, First order, Higuchi diffusion or Korsmeyer – Peppas, Male New Zealand albino rabbits.*

I.INTRODUCTION

The pharmaceutical companies are presently seeking innovative dosage forms by way of novel drug delivery systems as they represent strategic tool for expanding markets and indications, extending product life cycles and generating newer opportunities[1]. It is a reality and this is illustrated by the fact that around 13% of the current global pharmaceutical market is accounted for NDDS. Among the NDDS, transmucosal drug delivery market recorded second highest growth in the last five years with 171% where as overall market growth stands at 106% [2-3]. The main impediment for oral delivery of these drugs is their inadequate oral absorption due to extensive presystemic metabolism and instability in acidic environment[4-5]. As a result, the full therapeutic potential of many drugs cannot be realized; hence administration through highly expensive and less patient friendly parenteral route is inevitable[6].

In comparison, transmucosal delivery systems exhibit a faster delivery than do transdermal delivery systems. Also, delivery occurs in a tissue that is more permeable than skin and is less variable between patients, resulting in minimal inter subject variability[7]. The absorptive mucosae include buccal, sublingual, palatal, gingival, nasal, pulmonary, rectal, vaginal and ocular routes. On the other hand, in case of nasal delivery, availability of very small surface area for absorption as well as the large variability in mucus secretion could significantly affect drug absorption. Further, severe sensitivity to drugs causes significant irreversible damage to the mucosa. In pulmonary delivery, despite the enormous surface area available for absorption, the major challenge is the reproducible placement of drug in the alveolar region due to the mucociliary clearance, hence not suitable for sustained delivery[8-9]. Among all transmucosal sites, buccal cavity was found to be the convenient and easily accessible site for the local or systemic delivery of drugs. Because of its expanse of relatively immobile smooth muscle, abundant vascularization, direct access to the systemic circulation through the internal jugular vein that bypasses hepatic first pass metabolism, makes it highly promising for delivery of drugs exhibiting poor oral bioavailabilities. Facile removal of formulation, better patient acceptance and compliance are some other

CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.2656643

Available online at: http://www.iajps.com *Research Article*

PREPARATION AND EVALUATION OF TAPENTADOL MOUTH DISSOLVING TABLETS

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Article Received: February 2019 **Accepted:** March 2019 **Published:** April 2019

Abstract:
Mouth dissolving tablets are solid dosage forms containing tapentadol as active pharmaceutical ingredient which has analgesic effect, and has superdistegrants like croscarmellose sodium and starch glycolate which disintegrates fast usually less than 60 seconds without the need of water when placed on the tongue. To prepare and evaluate tapentadol mouth dissolving tablet by using direct compression method and to determine the effect of formulation process and the excipients. Tapentadol MDT were formulated by using ingredients and superdisintegrants like sodium starch glycolate and cross carmellose.The resulting tablets were evaluated using parameters such as: hardness, friability, disintegration time in vitro, modified disintegration time, disintegration time in the oral cavity, wetting time, water absorption ratio, drug content determination, weight uniformity, and dissolution. The results showed that tapentadol mouth dissolving Tablets fulfilled the requirements for all parameters except for F1 formula that did not produce physical shape intact tablet. MDT s used higher amount of crosscarmellose showed faster disintegration time. FTIR studies and calibration curve show there is interaction between drug and excipients tablet hardness were also higher. In vitro drug release of all formulation MDTS showed fast drug release with in few sec. The study reveals that formulations prepared by direct compression F3 exhibits highest dissolution using cross carmallose sodium showed faster drug release 90.15% over the period of 50min while disintegration time of the tablet was showed 50sec in comparison to other formulations of tapentadol.

Keywords: *sodium starch glycolate,crosscarmellose sodium, disintegration tapentadol mouth dissolving tablets.*

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QR code

Please cite this article in press Shiva Kumar et al., ***Preparation and Evaluation of Tapentadol Mouth Dissolving Tablets.,*** *Indo Am. J. P. Sci, 2019; 06(04).*

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168

ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 12, Issue 2, 2019

Online - 2455-3891
Print - 0974-2441

Research Article

FORMULATION AND EVALUATION OF GEL LOADED WITH MICROSPHERES OF APREMILAST FOR TRANSDERMAL DELIVERY SYSTEM

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Received: 29 August 2018, Revised and Accepted: 09 November 2018

ABSTRACT

Objective: The main objective of the present research work was to formulate and evaluate gel loaded with microspheres of apremilast to increase bioavailability and to reduce the dosing frequency and to improve patient compliance.

Methods: Gel loaded with microspheres of apremilast was prepared by solvent evaporation method by taking different ratios of polymers. Ethyl cellulose as a polymer, dichloromethane solvent is used as drug solubility, polyvinyl alcohol as a surfactant, and sodium alginate is used as gelling agent. Prepared gel loaded with microspheres was evaluated for drug interactions by Fourier transform infrared (FTIR), differential scanning calorimetry studies, and surface morphology by scanning electron microscopy (SEM), to select effective one among all formulations. The prepared formulations (F1–F6) were evaluated for pre-formulation studies, spreadability, viscosity, pH measurement, gel strength, homogeneity, drug content, *in vitro* diffusion studies, drug kinetics, and finally for stability studies.

Results: Differential scanning calorimeter studies confirmed that there is no drug interaction between drug and excipients. FTIR spectroscopy studies confirmed that there is compatibility between drug and excipients. Regular and spherical shape particles with smooth surface were observed in the SEM photographs. The optimized gel loaded with microspheres of F4 formulation (drug: polymer in 1:4 ratio) is more effective compared to all formulations. The prepared gel showed acceptable physical properties such as spreadability (5.86±0.54 g.cm/s), viscosity (568 cps), pH (6.33±0.55), gel strength (38 s) and drug content (90.00±0.71%). In vitro diffusion studies have shown 80.1±1.92% drug release in 10 h. Drug kinetics follows zero order kinetics and n value was found to be 0.721. Stability studies were done for 3 months.

Conclusion: All the results show that the gel loaded with microspheres of apremilast can be effectively used for the treatment of psoriasis and psoriatic arthritis.

Keywords: Apremilast, Dichloromethane, Ethylcellulose, Gel loaded with microspheres, Polyvinyl alcohol, Sodium alginate.

 DOI: http://dx.doi.org/10.22159/ajpcr.2019.v12i2.29374

INTRODUCTION

Psoriasis and psoriatic arthritis are a chronic skin disease of autoimmune system that is identified as patches of abnormal skin [1]. Apremilast inhibits the enzyme phosphodiesterase 4 which leads to spontaneous inhibition of tumor necrosis factor-alpha production from human rheumatoid synovial cell [2]. In addition, the application of oral drug delivery has numerous problems such as abdominal pains, upper respiratory, nasopharyngitis, and depression that often ends in lack of patient compliance [3]. Drugs that are not soluble in water can be entrapped in microsponge pores, which are extremely small, thus the drug functions as microscopic particles, producing a greater surface area and increasing the rate of solubilization [4].

Microspheres defined as solid spherical particles, approximately the size ranges from 1 to 1000 μm containing dispersed drug molecules either in solution or crystalline forms [5]. They are shallow spherical, free-flowing powders consisting of proteins polymers or synthetic polymers which are biodegradable in nature [6].

Microspheres are a polymeric matrix system which contains the drug in a state of uniform distribution throughout the matrix. Polymers such as ethyl cellulose are used for the preparation of matrix-type microspheres of water-soluble drugs to control the dissolution rate of drugs from the dosage forms [7]. Transdermal gels are a semisolid system, they prepared from a liquid which is thickened with other ingredients. The drug release through skin membrane and preparation of gelling agent sodium alginate is used [8]. The present work is to increase bioavailability and reduce the dosing frequency and improve patient compliance by designing formulation and evaluation of gel loaded with microspheres of apremilast for treating psoriasis and psoriatic arthritis.

MATERIALS AND METHODS

Materials

Apremilast (Gift sample by Alembic Pharmaceuticals Limited, Vadodara, India), It is a water-insoluble drug, so it is chosen as a main drug. Ethyl cellulose was used as a polymer (Qualikems Fine Chem Pvt., Ltd.). Polyvinyl alcohol is used as a surfactant (Qualikems Fine Chem Pvt., Ltd., Vadodara, India). Sodium alginate is used as a gelling agent (NR Chem, Mumbai). Dichloromethane is used as drug solubility (Qualikems Fine Chem Pvt., Ltd.).

Methods

Formulation of gel loaded with microsphere

Preparation of apremilast microspheres

Using solvent evaporation method, apremilast microspheres were prepared. By taking ethyl cellulose as a polymer and solution of dichloromethane solvent were used with combination to get perfect dissolution of drug in it. Initially, formulation was developed to select a best-suited solvent system for selected solvent evaporation method. The drug and polymer ratio concentration was remained constant for the formulation F1–F6. Desired quantity of ethyl cellulose polymer was dissolved in 10 ml dichloromethane solvent. Calculated drug was added

International Journal of Pharmacy and Biological Sciences
ISSN: 2321-3272 (Print), ISSN: 2230-7605 (Online)
IJPBS™ | Volume 8 | Issue 4 | OCT-DEC | 2018 | 915-926
Research Article | Pharmaceutical Sciences | Open Access | MCI Approved| ज्ञान-विज्ञान विमुक्तये
|UGC Approved Journal |

PREPARATION AND *INVITRO* EVALUATION OF HIGHLY POROUS GASTRORETENTIVE FLOATING BECLOMETHASONE DIPROPIONATE TABLETS

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ABSTRACT

The present study is aimed to formulate floating gastro retentive (GR) tablets containing beclomethasone dipropionate using a sublimation material for prolongation of gastric residence time. Three different ratios of hydroxyl propyl methyl cellulose (HPMC) K4M is used in three different methods for the preparation of tablets. In this case, the drug release from tablet was highly dependent on the polymer concentrations. Camphor, the sublimation material is used in the preparation of GR tablets. Camphor changes to pores in the tablet during the sublimation process. As the camphor gets sublimed, floating properties and density of tablets were affected by the sublimation of camphor. Gastro retentive floating beclomethasone dipropionate tablets which were prepared floated for over 24 hrs and had no floating lag time. Therefore, as the concentration of camphor in the tablet matrix increases, the hardness of the tablet decreased after sublimation. Release profiles of the drug from the GR tablets were not affected by tablet density or porosity.

KEY WORDS

Beclomethasone Dipropionate, gastro retentive floating tablets, HPMCK4M, sublimation method.

INTRODUCTION

The principle and more advisable route for delivering a drug is the oral route, but in case of physiological variability like gastro intestinal transit and GRT there is a major problem. The controlled oral drug delivery of GRT is always less than 12h, and it plays a vital role in complete dosage form transit [1, 3]. These characteristics lead to evolution of a drug delivery system that retains in the stomach for a prolonged and predictable time [2].

Floating drug delivery systems (FDDS) have low bulk density than that of gastric fluids. Due to their lower densities, FDDS float above the gastric content without effecting gastric emptying rate for longer duration of time and it provides controlled release of drug [3]. These systems have been extensively used because there are no interactions in relation to the motility of the GIT and a large number of floating dosage forms commercialized and marketed worldwide. Two systems have been used in the development of FDDS, on the basis of mechanism of buoyancy. They are effervescent systems and non-effervescent system In Effervescent systems effervescent substances like carbonate/ bicarbonate salts and citric / tartaric acids are used to liberate Co_2. The liberated Co_2 is entrapped in the jellified hydrocolloid layer of the systems thus specific gravity is decreased and it is made to float above gastric content [4, 5].

In Single Layer Floating Tablets or Hydrodynamically Balanced System (HBS), Co_2 generating agents and the drug were mixed thoroughly within the matrix tablet to produce a formulation. And to remain buoyant in the stomach without effecting the gastric emptying rate for a prolonged period of time. The drug is released slowly at a desired rate [6, 8]. When the drug is completely released the system is expelled out from the stomach

International Journal of Pharmaceutical Sciences and Nanotechnology
Volume 11 • Issue 6 • November – December 2018
MS ID: IJPSN-02-28-18-MANGILAL

Research Paper

Formulation and *In Vitro* Evaluation of Bilayered Matrix Tablets of Pioglitazone for Immediate Release and Glimepiride for Extended Release

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Received October 10, 2018; accepted November 20, 2018

ABSTRACT

Bi-layer tablets are novel drug delivery systems where a combination of two or more drugs in a single unit having different release profiles which improves patient compliance and prolongs the drug action. The study was performed to design bilayer matrix tablets of pioglitazone for immediate release and glimepiride for extended release delivery system. Bilayered matrix tablets composed of two layers, one is immediate release and a second layer is extended release layers. The immediate release layer comprised sodium starch glycolate, and croscarmellose sodium as super disintegrates and extended release layer comprised ethyl cellulose and HPMC K4M as release retardant polymers. Direct compression method was employed for the formulation of bilayer tablets. *In vitro* studies have shown more than 80% of pioglitazone was released within 60 min. Ethyl cellulose and HPMC K4M retarded the release of glimepiride from the controlled release layer for 12 h. Drug release mechanism exponent (n) was determined for all formulations (0.689-0.789). The release of pioglitazone was found to follow a first order release and the release of glimepiride was followed zero order release model.

KEYWORDS: Pioglitazone; Glimepiride; Bilayer Tablets; First Order Release.

Introduction

Bi-layer tablets are novel drug delivery systems where a combination of two or more drugs in a single unit having different release profiles which improves patient compliance and prolongs the drug action. Two layer tablets may be designed for sustained release, one layer for the immediate release of the drug and second layer for extended release thus maintaining a prolonged blood level. Layers may be colored differently to identify the product. There are various types of bilayer tablet press such as (a) Single sided tablet press; (b) Double sided tablet press; and (c) Bilayer tablet press with displacement monitoring (Gopinath et al., 2013).

Dual release tablets are unit compressed tablet dosage forms that are intended for oral application. They contains two parts in which one part having a conventional or immediate release part and another one is for sustained or controlled release delivery (Pavani et al., 2011). These dosage forms are unique and could offer many advantages for delivery medications for chronic diseases such as diabetes.

In the present study, we sought to formulate bilayered tablets and evaluate their profiles towards the treatment of diabetes mellitus.

Materials and Methods

Materials

Glimepiride and pioglitazone procured from Naprod Life Science, Mumbai. Croscarmellose sodium, sodium starch glycolate, and hydroxypropyle methyl cellulose (HPMC K4M) obtained as gift samples from the Reliance cellulose Products Limited, Hyderabad. All chemicals were purchased from a local authorized dealer.

Methods

FTIR spectra

The FTIR spectrum of drug and other formulation ingredients were conducted in the range of 4000-450cm by the KBR pellet method. The observed peaks were compared with pure drug (Nanjwade and Manvi, 2011).

Solubility

Solubility analysis of Glimepiride was done in different solvents like dimethylformamide, methanol, methylene chloride, water, dilute alkali hydroxides and dilute acids. The solvents used for pioglitazone are acetone, acetonitrile, methanol, dimethylformamide and difluoromethylornithine (IP, 1996).

International Journal of Herbal Medicine
Available online at www.florajournal.com

E-ISSN: 2321-2187
P-ISSN: 2394-0514
IJHM 2019; 7(1): 08-10
Received: 06-11-2018
Accepted: 10-12-2018

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Development and evaluation of polyherbal emulgel formulation (A preventive hair care preparation)

M Ravi Kumar, Mangilal Teelavath and Shiva Kumar Yellanki

Abstract
The hair care polyherbal formulations were prepared in emulgel form by mixing the hydro alcoholic extract of four medicinal plants *Phyllanthus emblica* (*Phyllanthaceae*), *Centella asiatica* (*Apiaceae*), *Cucurbita pepo* (*Cucurbitaceae*), *Wedelia calendulacea* (*Asteraceae*), which are earlier reported to possess acclaimed hair growth promoting action. In this formulation carbopol 934 is used as gelling agent with herbal extracts. All formulations were evaluated for spreadability, viscosity, pH and Irritancy test. From the investigation, it can be concluded that the formulation of hair emulgel contain all good characters of an ideal emulgel and it was found to be harmless, more effective and economical.

Keywords: polyherbal formulation, hydroalcoholic extract, emulgel, carbopol

1. Introduction
The advantage of emugel topical delivery is to avoid first pass metabolism and avoids the risk of intravenous therapy. Topical delivery systems meant for cosmetic and skin diseases. Apart from advantages of gel, the major disadvantage is inability to deliver the hydrophobic drugs, to overcome this problem emulsion technology is recommended through gelling systems. Emugel is the water in oil or oil in water emulsion with active ingredient that incorporated in gelling agents, the system give the formulation more stability with desirable release of drugs [1, 2, 3].
The main object of present investigation to develop emugel system for hair care which consists polyherbal extract.

2. Materials and Methods
Carbopol, Span 80, Liquid paraffin, Triethanolamine, Methyl paraben, Propylene glycol, Rosemary oil, Castor oil, Lemongrass oil procured from Sisco research laboratories, Mumbai, India. Fresh fruits of *phyllanthus emblica*, leaves of *Centella asiatica*, *Wedelia calendulacea*, seeds of *cucurbita pepo* Collected from Local Area (cheeryal, Mechal Dist; Hyderabad).

2.1 Preparation of plant Extract
The fresh fruits of *phyllanthus emblica*, leaves of *Centella asiatica*, *Wedelia calendulacea*, seeds of *cucurbita pepo* were collected from nearby areas from cheeryal. The collected materials were shade dried and powdered, passed through mesh no 60, then subjected for maceration for 48 hrs with aqueous solvents. Collected powdered extracts were used for emugel preparation [4, 5].

2.2 Preparation of Emugel
Gels are transparent to opaque semi-solids containing a high ratio of solvent to gelling agent. The emulgel was formulated in three different steps [6, 7].
Step 1 Preparation of o/w emulsiuon.
Step 2 preparation of gel phase.
Step 3 Involves incorporation of emulsion into gel base with continuous stirring.

Gel was prepared by using various ratios carbopol 934 in queous solvent and stirring is applies on magenetic stirrer. Triethanolamine is added to maintain pH of all formulations. Oil phase is prepared by dossolvin span 80 in liquid paraffin and queous phase with extract in aqueous solvent. Methyl paraben was added as preservatiove. Oil and aqueous phases were preheated separately at 70°C to 80°C and both were mixed together and applied stirring until its get cool and gel formation.

RESEARCH ARTICLE

inventi | Spreading Knowledge

Formulation and Evaluation of Buccal Mucoadhesive Patches for the Treatment of Hypertension

Shiva Kumar Yellanki[1*], Uday Kumar K[1], Teelavath Mangilal[1], M Ravi Kumar[1]

Abstract: Nimodipine is dihydropyridine calcium channel blocker, generally used for the treatment of high blood pressure. It has shown the good results in preventing major issues of subarachnoid hemorrhage (a form of cerebral hemorrhage) termed vasospasm; this is currently the main use of nimodipine. In the present study buccal drug delivery of nimodipine was developed. Matrix type of buccal patches was developed by using polymers HPMC K4M, HPMC K15M and HPMC K100M, sodium alginate and PVP K 30. Buccal patches were formulated by employing solvent casting method. Drug and excipient compatibility studies were implemented by using FTIR, DSC and no interaction was observed. Formulations were prepared with the different concentrations of polymers from the F1-F9, all the formulated patches were evaluated for the various physical parameters like physical appearance, flatness, thickness, weight variation, drug content, moisture absorption, moisture loss, swelling study, folding endurance and all the results were obtained within the pharmacopeial limits. In *in-vitro* drug release studies by using dialysis membrane, among all the 9 formulations F7 formulation which contain HPMC K100M 175 mg had shown 97.57% cumulative drug release within 12 hours. For F7 formulation release kinetics was plotted and the regression coefficient value was found to be high for Pappas release model was 0.991.

INTRODUCTION

The buccal mucosa provides readily accessible route for transmucosal delivery. Absorption through the buccal mucosa overcomes the early degradation of drug due to the pH of the gastro intestinal tract and enzyme activity and avoids active drug loss due to acid hydrolysis, presystemic metabolism, therapeutic plasma concentration of the drug can be rapidly achieved. The adhesive properties of such drug delivery platforms can reduce the enzymatic degradation due to the increased affinity between the delivery vehicle and the absorbing membrane. It has also been used as pharmaceutical excipients in conventional dosage forms as well as in novel applications involving bioadhesion and transmucosal drug transport. [1]

Transmucosal routes of drug delivery offer distinct advantages over per oral administration for systemic drug delivery. [2] These advantages include possible bypass of first pass effect, avoidance of presystemic elimination within the GI tract and depending on the drug, better enzymatic flora for drug absorption. [3]

Therefore, in the present study an attempt was made to formulate and evaluate nimodipine buccal mucoadhesive patches using various polymers.

MATERIALS AND METHODS

Nimodipine was supplied by NATCO pharmaceuticals, Hyderabad. HPMC K4M and HPMC K15M were purchased from Merck Specialities Pvt Ltd., Mumbai and all other materials were procured from S D Fine Chemical Ltd., Mumbai. All solvents used were of analytical grade.

Drug-Excipients Compatibility Studies

FT-IR spectroscopy was determined to find any physical and chemical interaction between the drug and other excipients used in the dosage form. FTIR spectrum was performed for the pure nimodipine powder and the optimized formulation. Samples were mixed with the KBr then pressed to form the disc. Then this disc was investigated using FTIR spectroscopy in the range 4000-400 cm^{-1}. [4] It is the leading thermal analysis technique. It is supposed that the thermal properties (melting point, change in enthalpy, etc.) of the individual components are compatible with each other. DSC scans were employed for the pure nimodipine powder and physical mixture of the drug and polymers (optimized formulation) of nimodipine buccal patch. The test was carried out by using a Shimadzu DSC apparatus with temperature range 50-300 and in a rate 10/min. DSC stands to benefit over other conventional techniques in requirement of short time of analysis and low sample consumption. [5]

Development of Buccal Patches

Buccal drug delivery patches were prepared by solvent casting method. HPMC K4M, HPMC K15M and HPMC K100M were weighed in requisite ratios and they were then dissolved in distill water as solvent using magnetic stirrer. Nimodipine (175 mg), Sodium alginate requisite and Poly ethylene glycol was added to the above dispersion under continuous stirring. The uniform dispersion was poured in the petri plate. The rate of evaporation of solvent was controlled by inverting cut funnel over the patches.

Total area of the petri dish was = 69.4 cm^2
Drug require in (2×2cm^2) = 10 mg
So total drug loaded = 175 mg.

Evaluation of Patches

1. Physical Appearance

This test includes visual examination of the patches. [6]

2. Thickness

Three patches are randomly selected from the each formulation of different batches. And then the thickness of each patch was measured by screw gauge. [7]

3. Weight Variation

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162

EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 5
Issue: 9
465-471
Year: 2018

PREPARATION AND EVALUATION OF RIZATRIPTAN SUBLINGUAL TABLETS BY USING SUPERDISINTEGRANTS

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Article Received on 15/07/2018 **Article Revised on 06/08/2018** **Article Accepted on 27/08/2018**

ABSTARCT
The present aim of study is to formulate and evaluate Sublingual tablets of Rizatriptan. Super disintegrating agents like Sodium starch glycolate, Gellan gum, and Croscarmellose sodium were employed has to increase the solubility and dissolution rate of the Rizatriptan drug molecule. Formulation of sublingual tablets was carried out by using direct compression method in 8 station rotary punching machine with a 6mm punch for all formulations. The mixture of nine formulations was passed Pre-compression and Post-compression parameters and they passed all the quality control parameters as per IP limits. The FTIR and DSC studies were analyzed for compatibility studies. The F4 formulation was considered as the optimized formulation as it shown maximum amount of release of drug was found to be 99.16% in 8 min. Gellan gum as a super disintegrant shown maximum drug release in the concentration of 10mg in F4 formulation.

KEYWORDS: Rizatriptan, Croscarmellose Sodium, Gellan Gum and Sodium Starch Glycolate.

1. INTRODUCTION

Sublingual administration of drugs shows the fast onset of action is carryout as compared to oral route. The retention time of sublingual medication is three to ten times greater than the oral route and is just passed by the hypodermic infusion method. Sublingual route has several advantages over the avoidance of first-pass metabolism, progressed patient compliance and ease of self-medication. This course has particular points of interest over the enteral and parenteral course of medication because of its high blood supply, the onset of action and improved bioavailability into the systemic circulation.[1] Various components like pH, molecular weight, and lipid solubility may exploit this technique. From these properties, a solvent medication may disperse too gradually through the mucosa to be dynamic. The sublingual glands are also considered as salivary glands which produce the mucin and helps in the fabrication of saliva, required for the breakdown of particles. These glands present in the lining of the oral cavity that is below the tongue. This also provides slippery that helps in chewing and swallowing the food. The amount of drug that reaches into the systemic circulation from the site of administration is directly proportional to membrane thickness. It is expressed in the following order Sublingual>buccal>gingival>palatal.[2]

Because of greater permeation and high blood supply, this release rapid onset of action and instant dosing regimen with less delivery period of drugs with the sublingual route. Sublingual means "under the tongue". It is considered to a method of placing drug via mouth so that the drug highly absorbed through blood vessels below the tongue more than digestive track. The sublingually administered drug pharmacologically activates in 1 – 2 minutes which is effectively impressed in this route. Some of the drugs which are administered through the sublingual route are Steroids, barbiturates, cardiovascular drugs, and enzymes. This administered drug directly reaches to nutritional benefits which avoid subject to gastric system and liver.[3]

1.1 Factors Affecting the Sublingual Absorption.[4,5]

1. Solubility in Salivary Secretion
2. Binding to Oral Mucosa
3. pH and pKa of The Saliva
4. Lipophilicity of Drug
5. Thickness of Oral Epithelium.

Rizatriptan is a selective 5-HT 1B/1D agonist receptors have week affinity towards 5-HT1A, 5-HT5A AND 5-HT7 receptors and there is no pharmacological activity for 5-HT2, 5-HT3 OR 5-HT4 receptor subtypes. It helps to relieve a headache, pain, and other migraine symptoms including nausea, vomiting, sensitivity to light/sound. The migraines can be easily treated to return your normal routine and decreases the pain medications.

CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.1251171

Available online at: http://www.iajps.com Research Article

FORMULATIONANDEVALUATIONOFVORICONAZOLE BUCCAL PATCHES BY USING SELECTED POLYMERS

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Abstract:

The aim of the present study is to formulate and evaluate Voriconazole Buccal Patches. Voriconazole is a triazole antifungal drug that is generally used to treat serious, invasive fungal infections. These are generally seen in patients who are immune compromised, and include invasive candidiasis, invasive aspergillosis, and certain emerging fungal infections. In the present study buccal drug delivery of Voriconazole was developed Matrix type of buccal patches was developed by using polymers such as Chitosan and Eudragit S 100. Buccal patches were prepared by employing solvent casting method. Propylene glycol and Tween80 were selected as both permeation enhancer and plasticizer. Drug excipient compatibility studies were carried out by using FTIR, and it was observed that there were no interactions between drug and polymers. Formulations were prepared by the varying concentrations polymers ranging from F1-F6, and all the formulations were evaluated for various physical parameters such as Physical appearance, Flatness, Weight variation, Thickness, Folding endurance, Drug content, Moisture uptake, Moisture content. All the results were found to be were found to be within the pharmacoepial limits, invitro drug release studies done by using dialysis membrane. Among all the 06 formulations F4 formulation which contain Eudragit S 100 100mg has shown 95.76% cumulative drug release within 12 hours. For F4 formulation release kinetics were plotted and the Regression coefficient value was found to be high for Korsemeyer Peppas model plot i.e., 0.999.

Key words: *Voriconazole, Buccal Patches, Chitosan and Eudragit S 100*

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QR code

Please cite this article in press K.Chitra et al., ***Formulationandevaluationofvoriconazole Buccal patches By Using Selected Polymers,*** *Indo Am. J. P. Sci, 2018; 05(05).*

160

IJBPAS, September, 2018, 7(9): 1746-1757

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

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FORMULATION AND EVALUATION OF CLOPIDOGREL BISULFATE PROLIPOSOMES

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Received 27th March. 2018; Revised 14th April 2018; Accepted 19th May 2018; Available online 1st Sept. 2018

https://doi.org/10.31032/IJBPAS/2018/7.9.4537

ABSTRACT

The objective of present work is to develop proliposomes of Clopidogrel bisulfate, to increase the bioavailability, increase aqueous solubility and to decrease the side effects like gastric bleeding. Proliposomes are prepared by Film deposition on carrier method using sorbitol as carrier powder. Lecithin and cholesterol were used as lipid phase and Clopidogrel bisulphate as drug. The results have shown no interaction between the drug and polymer through FTIR studies. Clopidogrel proliposomes with good flowability were obtained. The particle size of the proliposomes was from 20 -3 µm from scanning electron microscope photographs. Percent drug content and Percent drug entrapment efficiency of optimized formulation was found to be 82.6% and 75.6%.The *invitro* percent drug release of optimized F4 formulation has showed 88.65 % at 10 hours. Stability studies show that the formulation was stable at 40°C and at 75% RH. Proliposomes exhibited better stability when compared with liposomes. Clopidogrel bisulfate proliposomes with good flowability and sustained released characteristics can be obtained by controlling drug and lecithin concentration. Proliposomes prove to be efficient drug carriers for sustained drug delivery of Clopidogrel bisulfate.

Keywords: Proliposomes, Clopidogrel bisulfate, lecithin, sorbitol *and in-vitro* release.

IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS)
e-ISSN:2278-3008, p-ISSN:2319-7676. Volume 13, Issue 5 Ver. II (Sep – Oct 2018), PP 11-19
www.iosrjournals.org

Effect of Lycopene on Pharmacokinetic and Pharmacodynamics of Gliclazide in Diabetic Animal Models

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Abstract
Background: *Diabetes mellitus is one of the metabolic disorders associated with high blood sugar levels. Utilization of natural drugs among patients under diabetes mellitus pharmacotherapy is across the board.* ***Objective:*** *To examine the pk-pd(pharmacodynamic-pharmacokinetic) interactions of lycopene and gliclazide in animal models and to understand the safety & effectiveness.* ***Methods:*** *Single and multiple dose interaction studies were carried out in normal rats, diabetes induced rats and rabbits to evaluate the effect of lycopene on the gliclazide activity. Blood samples from the study animals were used for the estimation insulin and glucose levels by using radioimmunoassay method and chemistry analyzer (automated) respectively. Homeostasis model assessment used for determination of β-cell function. Additionally, sophisticated HP-LC technique used for analysis of diabetic rabbits serum samples for gliclazide.* ***Results:*** *Gliclazide produces significant reduction in blood glucose levels in diabetic animals. However, tests examined from gliclazide in blend with lycopene indicated more prominent diminishment in blood glucose concentration in animals with diabetes.* ***Conclusion:*** *The study concludes that the lycopene along with gliclazide shows the significant pharmacodynamics interaction, but doesn't establish pharmacokinetics interaction up on single and multiple-dose treatment in animals.*

Key Words: *Lycopene; Gliclazide; Diabetes mellitus; Pharmacokinetics; Pharmacodynamics*

Date of Submission: 31-08-2018 Date of acceptance: 15-09-2018

I. Introduction

Multiple drug therapy is the simultaneous utilization of different drugs. It can be related to the solution and additionally utilization of excessive pharmaceuticals at measurements or frequencies higher than remedially basic. These restorative combinations might be lethal [29] or favorable [21] at the given therapeutic dose. Diabetes mellitus (DM) is a metabolic disorder signifies with blood sugar level is abnormally high due to insulin insufficiency and function or both [22]. Diabetic patient's shows decreased antioxidant levels and increased oxidative stress [6]. Gliclazide (second era sulfonylureas) is the favored decision of medication which is accounted for to have to have antioxidant properties [4] diminished inclination to prompt serious hypoglycaemia and cell reinforcement properties [30].The mechanism of action includes K^+ adenosine triphosphatase channel inhibition in pancreas [3] [23] and gliclazide predominantly metabolized by CYP2C9 and moderately by CYP3A4 [24]. Indeed, phyto chemical extracts from herbs either alone or as combination have been guaranteed to avert DM complications [5]. Of these plants, mulberry (*Morus alba L.*) leaf, fenugreek (*Trigonella foenumgraecum*) seed [14], and American ginseng (*Panaxquinquefolius*) root [12] are much of the time proclaimed as worthy. Lycopene is a carotenoid, richest source in tomato fruits (*Solanumlycopersicum*) [2]. It is also found in watermelon, papaya, pink grapefruit, and pink guava [25]. A wide-ranging literature collection from all scientific references revealed that lycopene has antioxidant [7], antidiabetic activity and also a CYP3A4 enzyme inhibitor [13]. Reference gives evidence for lycopene, most likely to prevent hepatocellular carcinoma development [28], improvement in sperm quantity [16], motivates cell proliferation to bone growth [15]. Nevertheless, there is limited information about lycopene activity on blood glucose levels and interaction with anti-diabetic drug gliclazide in animal models. Therefore, this study innovates the hypoglycemic activity of lycopene on gliclazide in animal models.

II. Methods

Drugs

Gift samples of gliclazide and lycopene acquired from DRL, Hyderabad, India, and Parry Phytoremedies private limited, Pune respectively. Alloxan (monohydrate) be procured from Loba Chemie, Mumbai, India. Analytical grade materials and reagents used for present study.

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ORIGINAL ARTICLE

Effect of Capsaicin on Pharmacodynamic and pharmacokinetics of Gliclazide in Animal models with Diabetes

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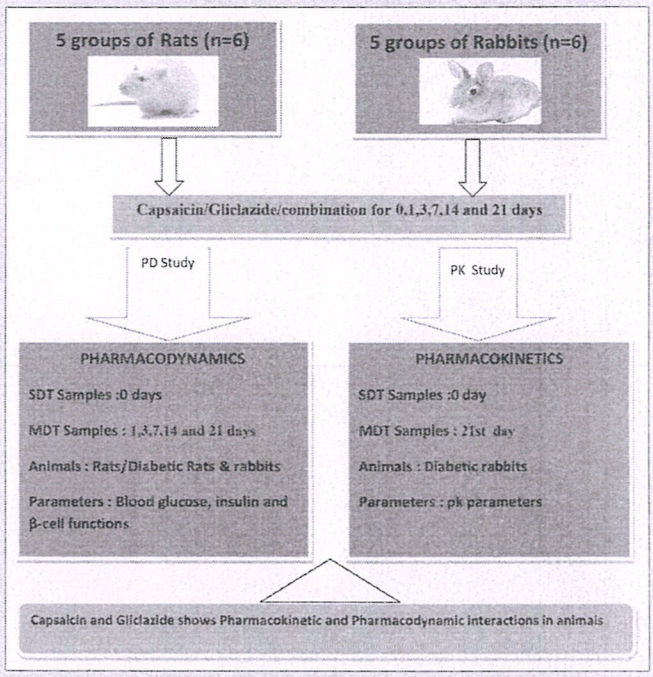
ABSTRACT

Background: Food–drug interactions can have great effect on the adverse effects of many drugs and also on the success of drug treatment. Gliclazide is one of the drugs of choice to treat type 2 diabetes. Capsaicin is present in *Capsicum annuum*, a spice found in regular food. **Objective:** The objective of the present study was to find out the pharmacodynamic (PD) and pharmacokinetic (PK) interactions of capsaicin on gliclazide in animal models using rats and rabbits. **Materials and Methods:** Single- and multiple-dose interaction studies were conducted in rats (normal and diabetic) and rabbits (diabetic) to evaluate the effect of capsaicin on the activity of gliclazide. Blood samples collected at predetermined time intervals from the experimental animals were used for the estimation of glucose and insulin levels using an automated clinical chemistry analyzer and radioimmunoassay method, respectively. β-cell function was determined by homeostasis model assessment. In addition, high-performance liquid chromatography technique was used to analyze the serum gliclazide levels in rabbits. **Results:** Capsaicin did not exhibit any hypoglycemic activity in normal rats, but exhibited significant antihyperglycemic activity in both diabetic rats and rabbits with improvement in insulin levels and β-cell function. Gliclazide showed significant reduction in blood glucose levels in normal and diabetic rats and diabetic rabbits. In addition, it significantly increased insulin levels and β-cell function in diabetic animals. The samples analyzed from all time points in combination with capsaicin showed significantly greater reduction in blood glucose levels and a significant increase in insulin levels and β-cell function in diabetic rats and rabbits. The PK parameters of gliclazide were also altered by capsaicin treatment in rabbits. **Conclusion:** The present study concluded that the interaction of capsaicin with gliclazide on single- and multiple-dose treatment was both PD and PK in nature.

Key words: Capsaicin, diabetes mellitus, drug interactions, gliclazide, pharmacodynamic–pharmacokinetic interactions

SUMMARY

- Human consumption of nutritional richest diets such as fruits and vegetables, and a meteoric rise in the consumption of dietary supplements and herbal products have substantially increased human exposure to phytochemicals. Phytochemicals have a capacity to produce biological activities and have the potential to both elevate and suppress cytochrome P450 activity. Capsaicin shows anti diabetic activity by enhancing insulin and β-cell function in diabetic rats & rabbits. The hypoglycemic effect was enhanced with the presence of gliclazide by elevation of insulin and β-cell functions more prominently also by inhibiting the gliclazide metabolism in animal models.



Abbreviations Used: CYP: Cytochrome P450, g: Gram, kg: Kilogram, C: Degree Celsius, %: Percentage, h: Hours, p.o.: Per oral, dL: Deciliter, µ: Micro, IU: International units, mL: milliliter, Cmax: Maximum concentration, Tmax: time to maximum, AUC: Area under the curve, AUMC: Area under the first moment curve, t1/2: Elimination half-life, kel: Elimination rate constant, MRT: Mean residence time, Cl: Clearance, ng: Nanogram, mg: Microgram

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DOI: 10.4103/pr.pr_81_18

Access this article online
Website: www.phcogres.com
Quick Response Code:

INTRODUCTION

The chances of foods to interact with medications are more, which can lead to serious adverse reactions. When a medication or food is taken orally, both of them travel through the same digestive system simultaneously. Hence, when a drug is mixed with food, it can alter the way the body metabolizes the food or vice versa. Some drugs interfere with the absorption of nutrients. Similarly, some foods can alter the therapeutic efficacy, bioavailability of a drug, and clearance (CL) and increase the risk of side effects. For example, theophylline is a medication used to treat asthma, which is found in tea, coffee, and chocolate. When theophylline is taken along with these

Cite this article as: Lagisetty U, Mohammed H, Ramaiah S. Effect of capsaicin on pharmacodynamic and pharmacokinetics of gliclazide in animal models with diabetes. Phcog Res 2018;10:437-41.

157

Available online on 15 June 2018 at http://ijdra.com/index.php/journal

International Journal of Drug Regulatory Affairs

Open Access to Pharmaceutical and Medical Research

Research Article

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Establishment of blending control for Hand operated Double Cone Blender

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ABSTRACT

In the current study, a fundamental approach is used to establish operation procedure, for a hand operated double cone blender. Initially, assuming for a potent drug, where in, the strength of the drug is very less in the final dosage form, a one percent concentration of potassium permanganate with respect to final one kilogram of blended powder using starch as diluent was planned. With a kind of geometric progression method, at a rate of 10 rotations per minute, the final outcome of the uniform distribution of the potassium permanganate was found to be for at least for fourteen hours of rotations, leading to concentration range of potassium permanganate 0.08 ± 0.025 mg per mg of final blended powder.

Keywords: Hand operated double cone blender, geometric method, blending controls.

Article Info: Received 21April, 2018; Review Completed 25 May 2018; Accepted 03 June 2018

Cite this article as:

Bayya S, Raveendran A, Baki R, Jinuka A. Establishment of blending control for Hand operated Double Cone Blender. International Journal of Drug Regulatory Affairs [Internet]. 15 Jun.2018 [cited 15 Jun. 2018]; 6(2):30-4. Available from: http://ijdra.com/index.php/journal/article/view/233

DOI:10.22270/ijdra.v6i2.233

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1. Introduction

A research was conducted on quality of marketed products and it was observed that a few products deviate from standards prescribed (1). A study was initiated with an objective of identifying the product quality attributes that are responsible for withdrawal or recall of the product from the market. To achieve the task, a few regulatory databases were reviewed and reasons for withdrawal were compiled. One of the reasons for product withdrawal or recall from the market is deviation from standard deviate (2). In a third study, a tablet dosage form was collected from market and in-house quality attributes were measured and the acceptable range was established, indicating the role of distribution curve and establishing acceptable limit from deviation with respect to quality attribute (3). A pilot survey was conducted earlier, to know the status of small scale pharmaceutical industry in terms of financial, scale of product, having manufacturing resources etc. It was observed that products available in the market from either small or large scale companies provide products complying to standards prescribed, with a few products deviating from standards irrespective of size of company (4). In one another study, health related quality of life of (HRQOL) of diabetic patients was studied by administering SF-36 questionnaire. It was observed that the scores of HRQOL being improved after counselling, regular administration of drug products (5).

Based on our past research conducted (2) and as per national or international drug regulatory guidelines, it is necessary that pharmaceutical manufacturing industry should fulfill installation, operational and performance qualification of the equipment. To ensure that, industry's research and development departments establishes procedures for various kinds of drug products which are using the same equipment? Even though, vendor of equipment for the manufacturing industry does provide the procedure, it is absolutely necessary that every company establish the various attributes in operation of the equipment so as to achieve the theoretical quality standard attributes fixed for the product. Several guidelines such as GMP, cGMP, WHOGMP, ICH, ISO insist on such protocols so as to ensure that the final products were ensured for quality, safety and efficacy. The current experimentation, even though well known, is aimed in disclosing as a fundamental approach to be known to the upcoming professionals in understanding the basic approaches of manufacturing. It is necessary to understand that several procedures established are not regularly seen by every professional in a manufacturing industry and the current article is aimed in disseminating

156

Establishment of Linearity and Molar Absorptivity for Sulphanilamide, Sulphamethoxazole and Sulphadimidine by Direct UV Spectroscopy Method

K. Anusha, T. Mamatha, B. Dinesh, Dr. Anil Kumar# & Dr. Bayya Subba Rao*

Abstract: *Sulpha drugs are well established anti-bacterial agents. Indian pharmacopoeial methods are a direct method of nitrite titration either using external indicator or potentiometric method. Reported methods include with coupling of diazotized sulpha drugs with certain reagents and later subjecting especially to visible spectroscopy. An attempt is made with respect to direct UV spectroscopy of individual selected sulpha drugs and is found promising for Sulphanilamide, Sulphamethoxazole and Sulphadimidine.*

Introduction

With advancement of time, analytical techniques are tending towards instrumental methods of analysis instead for titrations. Even though accurate and reproducible, titrations involve with usage of indicators or potentiometer and such methods are becoming cumbersome in preparing solutions and at a later stage standardizing the secondary solution, which in turn is used for assay of bulk drugs or estimation of drug products.

UV spectroscopy method involves with simple dilutions and estimating the absorbance, whereas HPLC involves with expenditure. In general, when a study of various volumes of Indian Pharmacopoeia was made, majority of the assay methods are tuned and upgraded to HPLC method where in both related and drug substance can be estimated at the same time[1]. UV spectroscopy is economical and pharmaceutical industries, especially for indigenous marketing, the method is favorable.

Sulphanilamide, Sulphamethoxazole and Sulphadimidine are the random selected bulk drugs from the class of Sulpha drugs where in Sulphadiazine was already reported for direct UV spectroscopy method[2]. An attempt is made to establish a direct UV Spectroscopy method for various other sulpha drugs using the analytical validation technique of the ICH guidelines.

Determination of λmax of Individual Sulpha Drugs

An individual stock solution of 1000 µg/ml of Sulphanilamide, Sulphamethoxazole and Sulphadimidine were prepared in methanol, methanol, 0.1 N HCl solvents respectively. Suitable dilutions were made to produce a 10 µg/ml solution and the solution was subjected to UV spectroscopy. It was observed with a λmax of 262.5 nm (for Sulphanilamide), of 270 nm (for Sulphamethoxazole) and of 240 nm, 301 nm (for Sulphadimidine), Figures 1, 2, 3.

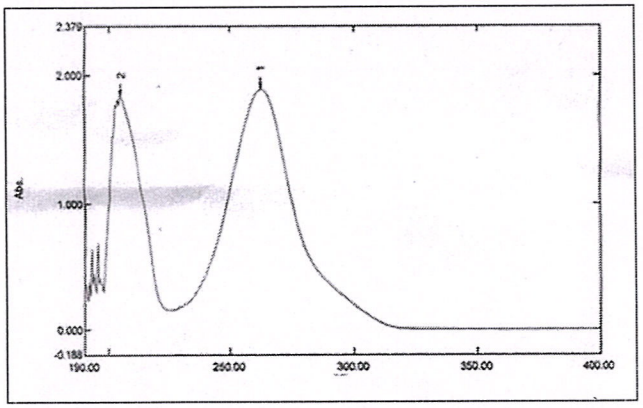

Figure 1: UV Spectroscopy Scan of Sulphanilamide (Absorbance vs. Wavelength in nm)

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155

Global Journal of
Pharmacy & Pharmaceutical Sciences
ISSN: 2573-2250

Juniper Publishers
Key to the Researchers

Research Article
Volume 6 Issue 5 - December 2018
DOI: 10.19080/GJPPS.2018.06.555697

Glob J Pharmaceu Sci

Development and Validation of A RP- HPLC Method for the Simultaneous Estimation of Valsartan and Sacubitril in Rat Plasma

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Submission: December 12, 2018; **Published:** December 21, 2018

*Corresponding author: N Anjaneyulu, Professor, Department of Pharmaceutical Analysis, Geethanjali College of Pharmacy, Cheeryal(V), Keesara(M), Medchal (Dist), Telangana, India

Abstract

A basic precise selective, sensitive isocratic technique was developed and valid for the quantitative synchronic estimation of Sacubitril and Valsartan drug in rat plasma was by RP- HPLC system. The chromatographic activity separation was administrated out on Intersil C18 (250 x 4.6mm, 5µm) column with a mix of acetonitrile: di-potassium hydrogen phosphate, pH 3.0 adjusted with Phosphate buffer (30:70%v/v) as mobile part. The analytes were eluted with a rate of flow of 0.8ml/min and at a wavelength of 271nm of UV detection. The strategy was valid for precision, accuracy, linearity, Limit of detection, Limit of Quantification, Ruggedness following the ICH guidelines.

The retention time was 10.725min and 15.366min and the system suitableness results was 99.95% and 100.24% for sacubitril and valsartan respectively. Linearity contemplate was completed between 100-500µg/ml and 5µg-25µg/ml, linear regression coefficient was observed to be 0.999 and the percentage recovery varies from 98-102% of Sacubitril and valsartan. No interference from any part of bulk and pharmaceutical dosage form was determined. All the parameters of validation are found to be at intervals within the vary that confirms the quality of the strategy for the determination of Sacubitril and Valsartan.

Keywords: Sacubitril; Valsartan; RP-HPLC; Method development; Validation

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Drug Profile

Sacubitril is chemically 4-{[(2S,4R)-1-(4-Biphenylyl)-5-ethoxy-4-methyl-5-oxo-2-pentanyl] amino}-4-oxobutanoic acid which is an antihypertensive drug used in combination with valsartan for the treatment of heart failure. Sacubitril could be a prodrug that's activated to sacubitril at (LBQ657) by de-ethylation via esterases. Sacubitril at inhibits the catalyst neprilysin, that is accountable for the degradation of chamber and brain symptom organic compound, a pair of blood pressure-lowering peptides that employment within the main by reducing blood volume. Valsartan is chemically (2S)-3-methyl-2-[pentanoyl- [[4- [2-(2H-tetrazol-5- yl) phenyl] phenyl] methyl] amino] butanoic acid. Valsartan is Associate in Nursing man of affairs that by selection inhibits the binding of Hypertensin to AT1, that's is found in several tissues like tube-shaped structure sleek muscle and in addition the adrenal glands [8-12].

This effectively inhibits the AT1-mediated agent vasoconstrictive and aldosterone-secreting effects of Hypertensin and finally ends up during a decrease in tube-

International Journal of PharmTech Research
CODEN (USA): IJPRIF, ISSN: 0974-4304, ISSN(Online): 2455-9563
Vol.11, No.01, pp 82-89, 2018

LC–MS/MS assay for baclofen, a derivative of γ –aminobutyric acid (GABA) in human plasma and its clinical application

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[4]Department of Pharmaceutical Chemistry, Surya School of Pharmacy, NH-45, GST Road, Vikravandi, Villupuram-605 652, India.

Abstract : A high performance liquid chromatography mass spectrometric method for the estimation of baclofen, in human plasma in positive ion mode was developed and validated using baclofen d4 as internal standard (IS). Sample preparation was accomplished by solid phase extraction technique. The reconstituted samples were chromatographed on Kromasil 100-5C8 4.6×150 mm columns using a mobile phase consisting of acetonitrile and 10mM ammonium acetate (80:20, v/v).The method was validated over a concentration range of 20.1 ng/mL to 1000ng/mL for baclofen. This validation report provides the results of selectivity, matrix effect, sensitivity determinations, linearity, precision and accuracy data, the results of recovery, various stabilities, run size evaluation and dilution integrity along with all pertinent documentation.

Keywords : Baclofen; Human plasma; LC–MS/MS; Method validation; Pharmacokinetics.

Introduction

Baclofen is a derivative of the neurotransmitter γ-aminobutyric acid (GABA) and most widely used spasmolytic agent. It is a skeletal muscle relaxant with its prime site of action in the spinal cord, where it binds to the inhibitory GABA-B receptor. After oral administration the drug is quickly absorbed and is widely distributed all over the body, low biotransformation and the baclofen is prevalently excreted by the kidneys without changing the form. The baclofen half-life is two to 2-4days to regulate spasticity accordingly[1,2].

As per literature, only few LC-MS/MS [3-5] have been reported for the determination of baclofen in biological samples. Flärdh *et al.*, 1999[3] developed a method for the determination of baclofen in plasma using

http://dx.doi.org/10.20902/IJPTR.2018.11109

CODEN [USA]. IAJPES ISSN. 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.2525362

Available online at: http://www.iajps.com Research Article

DEVELOPMENT AND VALIDATION OF A RP- HPLC METHOD FOR THE BIO-ANALYSIS OF OXCARBAZEPINE IN RAT PLASMA

N. Anjaneyulu*, R. Naga Kishore, M. Ravi Kumar, and D. Anil Naik
Department of Pharmaceutical Analysis, Geethanjali College of Pharmacy, Cheeryal(V), Keesara(M), Medchal (Dist), Telangana, India – 501301

Abstract

A new plan was fixed for estimation of Oxcarbazepine by RP-HPLC method. The chromatographic actions continue strongly grow for the break of Oxcarbazepine by applying Agilent C18 column (4.6×150mm) 5µ, flow rate was 1.0 ml/min, mobile phase ratio was Di- potassium hydrogen phosphate: ACN (70:30% v/v) detection wavelength was 593nm. The instrument used was WATERS HPLC Auto Sampler, Separation module 2695, photo diode array detector 996, Empower-software version-2. The confinements times continue begin to be 2.954mins. The % pureness containing Oxcarbazepine was begin to be 99.87%.The system fitness parameters for Oxcarbazepine such as theoretical plates also tracking component were begin to be 4600, 1.2. The analytic plan was approve in agreement with ICH protocol (ICH, Q2 (R1)). The linearity study of Oxcarbazepine act begin in absorption area of 20µg-100µg and correlation coefficient (r^2) was begin to be 0.999, % recovery was begin to be 100.56%, %RSD for repeatability was 0.17, % RSD for transitional precision was 0. 10. The precision study was precision, robustness also repeatability, LOD value was 0.303 and LOQ value was 1.011.

Keywords: *Agilent C18, Oxcarbazepine, RP-HPLC, and Rat plasma.*

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QR code

Please cite this article in press N. Anjaneyulu et al., Development And Validation Of A Rp- Hplc Method For The Bio-Analysis Of Oxcarbazepine In Rat Plasma., Indo Am. J. P. Sci, 2018; 05(12).

PRINCIPAL
Geethanjali College of Pharmacy
Cheeryal(V), Keesara(M), Medchal Dist. T.S.-501301.

152

WORLD JOURNAL OF PHARMACY AND PHARMACEUTICAL SCIENCES
SJIF Impact Factor 7.421
Volume 7, Issue 6, 654-665 Research Article ISSN 2278 – 4357

METHOD DEVELOPMENT AND VALIDATION FOR SIMULTANEOUS ESTIMATION OF TOLPERISONE AND PARACETAMOL BY RP-HPLC

N. Anjaneyulu*[1], R. Naga Kishore[1], A. Teja Sri[2], B. Niharika[1], M. Vyshnavi[1] and C. Chaithanya[1]

[1]Department of Pharmaceutical Analysis, Geethanjali College of Pharmacy, Cheeryal, Keesara, Medchal-Malkajgiri Dist, Telangana.

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Article Received on
25 March 2018,

Revised on 15 April 2018,
Accepted on 05 May 2018,

DOI: 10.20959/wjpps20186-11537

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ABSTRACT

A simple, sensitive, accurate, precise and rapid reverse phase high performance liquid chromatographic method has been developed and validated for the simultaneous determination of Tolperisone and Paracetamol from synthetic mixture. The chromatographic separation was performed on Imo Sil 5 C18 column (250 mm × 4.6 mm i.d, 5 µm particle size). Mobile phase consisted of a Acetonitrile and methanol in the ratio of 25:75, v/v at a flow rate of 1.0 ml/min. The detection wavelength was set at 261nm. The proposed method was validated for linearity, accuracy, precision, LOD and LOQ. The calibration was linear over the concentration range of 10-30 µg/ml for Tolperisone and 5-15 µg/ml for Paracetamol. The retention times were found to be 5.3 + 0.14min for Paracetamol and 2.4 + 0.13min for Tolperisone. The mean recoveries were 100.5 ± 0.34 and 98.2 ±0.80 for Tolperisone and Paracetamol, respectively. The method can be easily adopted for quality control analysis.

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150

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INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.2525362

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3

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ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 12, Issue 2, 2019

Online - 2455-3891
Print - 0974-2441

Research Article

FORMULATION AND EVALUATION OF GEL LOADED WITH MICROSPHERES OF APREMILAST FOR TRANSDERMAL DELIVERY SYSTEM

N. V. SAI PRIYANKA, P. NEERAJA*, T. MANGILAL, M. RAVI KUMAR

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Received: 29 August 2018, Revised and Accepted: 09 November 2018

ABSTRACT

Objective: The main objective of the present research work was to formulate and evaluate gel loaded with microspheres of apremilast to increase bioavailability and to reduce the dosing frequency and to improve patient compliance.

Methods: Gel loaded with microspheres of apremilast was prepared by solvent evaporation method by taking different ratios of polymers. Ethyl cellulose as a polymer, dichloromethane solvent is used as drug solubility, polyvinyl alcohol as a surfactant, and sodium alginate is used as gelling agent. Prepared gel loaded with microspheres was evaluated for drug interactions by Fourier transform infrared (FTIR), differential scanning calorimetry studies, and surface morphology by scanning electron microscopy (SEM), to select effective one among all formulations. The prepared formulations (F1–F6) were evaluated for pre-formulation studies, spreadability, viscosity, pH measurement, gel strength, homogeneity, drug content, *in vitro* diffusion studies, drug kinetics, and finally for stability studies.

Results: Differential scanning calorimeter studies confirmed that there is no drug interaction between drug and excipients. FTIR spectroscopy studies confirmed that there is compatibility between drug and excipients. Regular and spherical shape particles with smooth surface were observed in the SEM photographs. The optimized gel loaded with microspheres of F4 formulation (drug: polymer in 1:4 ratio) is more effective compared to all formulations. The prepared gel showed acceptable physical properties such as spreadability (5.86±0.54 g.cm/s), viscosity (568 cps), pH (6.33±0.55), gel strength (38 s) and drug content (90.00±0.71%). In vitro diffusion studies have shown 80.1±1.92% drug release in 10 h. Drug kinetics follows zero order kinetics and n value was found to be 0.721. Stability studies were done for 3 months.

Conclusion: All the results show that the gel loaded with microspheres of apremilast can be effectively used for the treatment of psoriasis and psoriatic arthritis.

Keywords: Apremilast, Dichloromethane, Ethylcellulose, Gel loaded with microspheres, Polyvinyl alcohol, Sodium alginate.

 DOI: http://dx.doi.org/10.22159/ajpcr.2019.v12i2.29374

INTRODUCTION

Psoriasis and psoriatic arthritis are a chronic skin disease of autoimmune system that is identified as patches of abnormal skin [1]. Apremilast inhibits the enzyme phosphodiesterase 4 which leads to spontaneous inhibition of tumor necrosis factor-alpha production from human rheumatoid synovial cell [2]. In addition, the application of oral drug delivery has numerous problems such as abdominal pains, upper respiratory, nasopharyngitis, and depression that often ends in lack of patient compliance [3]. Drugs that are not soluble in water can be entrapped in microsponge pores, which are extremely small, thus the drug functions as microscopic particles, producing a greater surface area and increasing the rate of solubilization [4].

Microspheres defined as solid spherical particles, approximately the size ranges from 1 to 1000 μm containing dispersed drug molecules either in solution or crystalline forms [5]. They are shallow spherical, free-flowing powders consisting of proteins polymers or synthetic polymers which are biodegradable in nature [6].

Microspheres are a polymeric matrix system which contains the drug in a state of uniform distribution throughout the matrix. Polymers such as ethyl cellulose are used for the preparation of matrix-type microspheres of water-soluble drugs to control the dissolution rate of drugs from the dosage forms [7]. Transdermal gels are a semisolid system, they prepared from a liquid which is thickened with other ingredients. The drug release through skin membrane and preparation of gelling agent sodium alginate is used [8]. The present work is to increase bioavailability and reduce the dosing frequency and improve patient compliance by designing formulation and evaluation of gel loaded with microspheres of apremilast for treating psoriasis and psoriatic arthritis.

MATERIALS AND METHODS

Materials

Apremilast (Gift sample by Alembic Pharmaceuticals Limited, Vadodara, India), It is a water-insoluble drug, so it is chosen as a main drug. Ethyl cellulose was used as a polymer (Qualikems Fine Chem Pvt., Ltd.). Polyvinyl alcohol is used as a surfactant (Qualikems Fine Chem Pvt., Ltd., Vadodara, India). Sodium alginate is used as a gelling agent (NR Chem, Mumbai). Dichloromethane is used as drug solubility (Qualikems Fine Chem Pvt., Ltd.).

Methods

Formulation of gel loaded with microsphere

Preparation of apremilast microspheres

Using solvent evaporation method, apremilast microspheres were prepared. By taking ethyl cellulose as a polymer and solution of dichloromethane solvent were used with combination to get perfect dissolution of drug in it. Initially, formulation was developed to select a best-suited solvent system for selected solvent evaporation method. The drug and polymer ratio concentration was remained constant for the formulation F1–F6. Desired quantity of ethyl cellulose polymer was dissolved in 10 ml dichloromethane solvent. Calculated drug was added

E-ISSN: 0975-8232; P-ISSN: 2320-5148

IJPSR (2018), Volume 9, Issue 8

(Research Article)

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 06 November, 2017; received in revised form, 23 January, 2018; accepted, 06 February, 2018; published 01 August, 2018

OPTIMIZATION AND DEVELOPMENT OF BIO SYNTHETIC SILVER NANO PARTICLES OF AZURIN- AN ANTI-CANCER AGENT FROM *PSEUDOMONAS AERUGINOSA*

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Keywords:

Bacterial proteins, Bio-synthetic methods, Anticancer activity, Nano particles and *Pseudomonas aeruginosa*

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ABSTRACT: The pretentious extract of *Pseudomonas aeruginosa* has shown promising anticancer activity. It contains a protein called Azurin. It has a molecular weight of 14 kDa. It is soluble in water. It is a type I copper-containing protein of cupredoxin family. In this work, *Pseudomonas aeruginosa* MTCC strain 647 was cultivated in modified Asparagine -proline broth. An attempt was done to isolate and purify azurin from *Pseudomonas aeruginosa* (MTCC 647) by using chromatography on sephadex G, CM cellulose and SDS PAGE electrophoresis. Recent studies have found that *Pseudomonas aeruginosa* can synthesize nano particles through either intracellular or extracellular mechanisms by bio synthetic means. Hence, the composite nano particles (Azurin-Ag NP) were synthesized by biosynthetic methods. *P. aeruginosa* MTCC strains 647 was cultivated in modified Asparagine -proline broth initially to produce shake flask cultures and then fed batch cultivation. From the bacterial extracted Azurin is isolated and purified to get a final concentration of 4.6 mg/g dry bacteria. As the nano particle mediated drug delivery effectively deliver the drug to the tumor cells, the composite nano particles (Azurin-Ag NP) were synthesized by biosynthetic methods. These bio synthetically produced Ag nano particles has loaded maximum 36 ng of Azurin protein. *Pseudomonas aeruginosa* MTCC strains 647 can be chosen as strain to produce Azurin in large scale. The anti-cancer activity of azurin is complimented with bio synthetic production of silver nano particles containing Azurin (Azurin-Ag-NPs).

INTRODUCTION: Cancer treatment is done by radiation, chemotherapy, surgery and immuno-therapy. Microorganisms and their products are found to prevent cancer regression with a remarkable anti-cancer activity [1].

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.9(8).1000-07

Article can be accessed online on: www.ijpsr.com

DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.9(8).1000-07

Bacterial proteins and peptides are new generation drugs which can act as effective anti-cancer drug [2].

The pretentious extract of *Pseudomonas aeruginosa* has shown promising anticancer activity. It contains a protein called Azurin. It has a molecular weight of 14 kDa. It is soluble in water. It is a type I copper-containing protein of cupredoxin family. In this work, it was attempted to isolate and purify azurin from *Pseudomonas aeruginosa* (MTCC 647). A biosynthetic method was developed to produce silver nano particles containing Azurin (Azurin-Ag-NPs).

IJBPAS, September, 2018, 7(9): 1746-1757

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

FORMULATION AND EVALUATION OF CLOPIDOGREL BISULFATE PROLIPOSOMES

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Received 27th March. 2018; Revised 14th April 2018; Accepted 19th May 2018; Available online 1st Sept. 2018

https://doi.org/10.31032/IJBPAS/2018/7.9.4537

ABSTRACT

The objective of present work is to develop proliposomes of Clopidogrel bisulfate, to increase the bioavailability, increase aqueous solubility and to decrease the side effects like gastric bleeding. Proliposomes are prepared by Film deposition on carrier method using sorbitol as carrier powder. Lecithin and cholesterol were used as lipid phase and Clopidogrel bisulphate as drug. The results have shown no interaction between the drug and polymer through FTIR studies. Clopidogrel proliposomes with good flowability were obtained. The particle size of the proliposomes was from 20 -3 µm from scanning electron microscope photographs. Percent drug content and Percent drug entrapment efficiency of optimized formulation was found to be 82.6% and 75.6%.The *invitro* percent drug release of optimized F4 formulation has showed 88.65 % at 10 hours. Stability studies show that the formulation was stable at 40°C and at 75% RH. Proliposomes exhibited better stability when compared with liposomes. Clopidogrel bisulfate proliposomes with good flowability and sustained released characteristics can be obtained by controlling drug and lecithin concentration. Proliposomes prove to be efficient drug carriers for sustained drug delivery of Clopidogrel bisulfate.

Keywords: Proliposomes, Clopidogrel bisulfate, lecithin, sorbitol *and in-vitro* release.

145

International Journal of Pharmaceutical Sciences and Nanotechnology
Volume 11 • Issue 6 • November – December 2018
Research Paper
MS ID: IJPSN-02-28-18-MANGILAL

Formulation and *In Vitro* Evaluation of Bilayered Matrix Tablets of Pioglitazone for Immediate Release and Glimepiride for Extended Release

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Received October 10, 2018; accepted November 20, 2018

ABSTRACT

Bi-layer tablets are novel drug delivery systems where a combination of two or more drugs in a single unit having different release profiles which improves patient compliance and prolongs the drug action. The study was performed to design bilayer matrix tablets of pioglitazone for immediate release and glimepiride for extended release delivery system. Bilayered matrix tablets composed of two layers, one is immediate release and a second layer is extended release layers. The immediate release layer comprised sodium starch glycolate, and croscarmellose sodium as super disintegrates and extended release layer comprised ethyl cellulose and HPMC K4M as release retardant polymers. Direct compression method was employed for the formulation of bilayer tablets. *In vitro* studies have shown more than 80% of pioglitazone was released within 60 min. Ethyl cellulose and HPMC K4M retarded the release of glimepiride from the controlled release layer for 12 h. Drug release mechanism exponent (n) was determined for all formulations (0.689-0.789). The release of pioglitazone was found to follow a first order release and the release of glimepiride was followed zero order release model.

KEYWORDS: Pioglitazone; Glimepiride; Bilayer Tablets; First Order Release.

Introduction

Bi-layer tablets are novel drug delivery systems where a combination of two or more drugs in a single unit having different release profiles which improves patient compliance and prolongs the drug action. Two layer tablets may be designed for sustained release, one layer for the immediate release of the drug and second layer for extended release thus maintaining a prolonged blood level. Layers may be colored differently to identify the product. There are various types of bilayer tablet press such as (a) Single sided tablet press; (b) Double sided tablet press; and (c) Bilayer tablet press with displacement monitoring (Gopinath et al., 2013).

Dual release tablets are unit compressed tablet dosage forms that are intended for oral application. They contains two parts in which one part having a conventional or immediate release part and another one is for sustained or controlled release delivery (Pavani et al., 2011). These dosage forms are unique and could offer many advantages for delivery medications for chronic diseases such as diabetes.

In the present study, we sought to formulate bilayered tablets and evaluate their profiles towards the treatment of diabetes mellitus.

Materials and Methods

Materials

Glimepiride and pioglitazone procured from Naprod Life Science, Mumbai. Croscarmellose sodium, sodium starch glycolate, and hydroxypropyle methyl cellulose (HPMC K4M) obtained as gift samples from the Reliance cellulose Products Limited, Hyderabad. All chemicals were purchased from a local authorized dealer.

Methods

FTIR spectra

The FTIR spectrum of drug and other formulation ingredients were conducted in the range of 4000-450cm by the KBR pellet method. The observed peaks were compared with pure drug (Nanjwade and Manvi, 2011).

Solubility

Solubility analysis of Glimepiride was done in different solvents like dimethylformamide, methanol, methylene chloride, water, dilute alkali hydroxides and dilute acids. The solvents used for pioglitazone are acetone, acetonitrile, methanol, dimethylformamide and difluoromethylornithine (IP, 1996).

CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.2656643

Available online at: http://www.iajps.com *Research Article*

PREPARATION AND EVALUATION OF TAPENTADOL MOUTH DISSOLVING TABLETS

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Article Received: February 2019 **Accepted:** March 2019 **Published:** April 2019

Abstract:
Mouth dissolving tablets are solid dosage forms containing tapentadol as active pharmaceutical ingredient which has analgesic effect, and has superdistegrants like croscarmellose sodium and starch glycolate which disintegrates fast usually less than 60 seconds without the need of water when placed on the tongue. To prepare and evaluate tapentadol mouth dissolving tablet by using direct compression method and to determine the effect of formulation process and the excipients. Tapentadol MDT were formulated by using ingredients and superdisintegrants like sodium starch glycolate and cross carmellose.The resulting tablets were evaluated using parameters such as: hardness, friability, disintegration time in vitro, modified disintegration time, disintegration time in the oral cavity, wetting time, water absorption ratio, drug content determination, weight uniformity, and dissolution. The results showed that tapentadol mouth dissolving Tablets fulfilled the requirements for all parameters except for F1 formula that did not produce physical shape intact tablet. MDT s used higher amount of crosscarmellose showed faster disintegration time. FTIR studies and calibration curve show there is interaction between drug and excipients tablet hardness were also higher. In vitro drug release of all formulation MDTS showed fast drug release with in few sec. The study reveals that formulations prepared by direct compression F3 exhibits highest dissolution using cross carmallose sodium showed faster drug release 90.15% over the period of 50min while disintegration time of the tablet was showed 50sec in comparison to other formulations of tapentadol.

Keywords: *sodium starch glycolate,crosscarmellose sodium, disintegration tapentadol mouth dissolving tablets.*

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QR code

*Please cite this article in press Shiva Kumar et al., **Preparation and Evaluation of Tapentadol Mouth Dissolving Tablets.**, Indo Am. J. P. Sci, 2019; 06(04).*

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143

Preparation and *in vivo* evaluation of sodium alginate - poly (vinyl alcohol) electrospun nanofibers of forskolin for glaucoma treatment

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Abstract: The present investigation is aiming to prepare Sodium Alginate (SA) - Poly (vinyl alcohol) (PVA) nanofibrous mats of Forskolin (FSK) for ocular delivery to treat the glaucoma. Nanofibers of SA: PVA (1:0.25) load with β- cyclodextrin- FSK solid dispersion were successfully prepared by an electrospinning technique. Eight formulations were Prepared and evaluated for drug content, scanning electron microscopy, degree of swelling, drug release and *In Vivo* Intra ocular pressure (IOP) reduction studies. The morphological studies revealed that average diameter of prepare nano fibers were decreased for formulations with low polymer concentration. Less diameter and uniform surface was observed for formulations F4 and F8 which are prepared under applied voltage 20kV, Capillary tip-to-Collector distance 15cm conditions. From the degree of swelling studies, it was observed that thinner the nanofiber mats, the greater the degree of swelling. The burst release within one hour was seen for F1 to F4 formulations whereas up to 90 min for F5 to F8 formulations. Release kinetic studies revealed that release of drug from the Nanofibrous mats have followed zero order kinetics. The results of *in vivo* IOP reduction studies suggested that FSK loaded Nanofibrous mats formulation (F4) produced a significant and controlled reduction in IOP throughout 45h.

Keywords: Electrospinning technique, Forskolin, Solid dispersions, *In Vivo* Intra ocular pressure (IOP) reduction studies, Nanofibrous mats.

INTRODUCTION

Nano fibers are having vital applications in biomedical field for drug delivery. Due to large surface area of nano fibers, they are more efficient for drug delivery and wound healing (Chew *et al.,* 2006).

By electro spinning method small scale diameter fibers were produced by application of high potential to the fluid polymer solution during ejection on the grounded collector, during this process the liquid solvent evaporate. This formed fibers having major roll for delivery of drugs and in biomedical research (Ashammakhi *et al.,* 2008),(LeDuc *et al.,* 2007). Glaucoma may caused and related to age, other disease conditions and family history, this disease causes nerve ending or optical nerve damage due to more intra ocular pressure (IOP) (Quigley *et al.,* 1997; Quigley, 1996; Sommer, 1996).

Electrospinning is a relatively simple process to produce nanofibrous structures from polymer solutions and is consequently most commonly applied. This technique relies on electrostatic forces realized by an electric field that is applied between the tip of a nozzle, through which the polymer solution is flowing, and a collector plate. This electric field induces a distortion of the polymer solution from a spherical pendent drop to a Taylor cone. Once the electrostatic forces exceed the surface tension of the polymer solution, a jet is drawn from the tip of the Taylor cone. Solvent evaporation and interaction of the charges with the external electric field cause instability of the jet, which in turn causes bending and splaying. As a result, the jet elongates and nanofibres are randomly deposited on the collector plate.

Alginate is naturally occurring polymer and it convert in to gel form due to ion exchange with lachrymal fluid and it is biocompatible (Augst *et al.,* 2006).

Forskolin , a labdane diterpene extracted from the Coleus forskohlii roots (Bhat *et al.,* 1977), is used for hypertension, cardiovascular diseases (Kansal *et al.,* 1978), (Dubey *et al.,*1997), asthma, (Suryanayanan *et al.,* 1998), (Lazarus *et al.*, 1961). Forskolin activates adenylatecyclase and amount of cyclic AMP (adenosine mono phosphate) in cells this process initiates the activity.

Coleus forskohlii is a botanical that has been used since ancient times and Ayurvedic traditional medicine. The root portion of the plant has been traditionally used for medicinal purposes and contains the active constituent, forskolin. Forskolin was named after the Finnish botanist, Forskal. Historically, it has been used to treat hypertension, congestive heart failure, eczema, colic, respiratory disorders, obesity, asthma, angina, painful urination, insomnia and convulsions (Sangeetha *et al.*, 2011).

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142

RESEARCH ARTICLE

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Formulation and Evaluation of Gastroretentive Floating Microspheres of Nicardipine

Shiva Kumar Yellanki[1*], M Naga Prashanthi [1], M Ravi Kumar[1]

Abstract: The present study was aimed at development of gastroretentive floating microspheres of nicardipine for controlled release and to develop innovative and suitable dosage form by the use of various polymers. Nicardipine is an antihypertensive drug it is a dihydropyridine calcium-channel blocking agent used to treat the vascular disorders such as chronic stable angina, hypertension. Different floating microspheres formulations were prepared using different polymers like locust bean gum, gellan gum, Eudragit S 100, Eudragit L 100, sodium alginate in various combination ratios by ionotropic gelation method. All the developed formulations were subjected to various evaluation parameters such as particle size, micromeritic study, percentage yield, drug entrapment efficiency, *in-vitro* buoyancy, swelling index, floating behaviour, *in-vitro* drug release scanning electron microscopy (SEM) and stability studies. Optimized formulation was decided based on drug release studies, buoyancy studies, percentage yield, gastro retention time, swelling index, zero order, first order, Higuchi model, korsmeyer peppas model. Formulation containing sodium alginate and locust bean gum in combination (F3) exhibited maximum drug release of 97.33% for 12 hrs and scanning electron microscopy (SEM) revealed smooth surface characteristics with less particle size and good flow properties hence it was confirmed as the optimized formulation.

INTRODUCTION

Microspheres are small spherical particles with diameter of 1-200 µm which have gained great attention due to their free flowing powder characteristics and biodegradable nature generally made up of natural or synthetic polymeric materials. As microspheres are made up of small particle size less than 200 µm the drug absorption and side effects due to irritating drugs against the gastrointestinal mucosa is improved and they are widely distributed throughout the gastrointestinal tract. [1-3]

Floating microspheres are low density systems remains buoyant in gastric content for prolonged period of time. Variations in gastric emptying rates of conventional dosage forms can be reduced by these systems due to prolongation of gastric retention time of dosage forms. In addition to this drug is released slowly and constantly at desired rate from the floating microspheres. There is reduction in plasma concentration fluctuations due to low density of microspheres and remain floated in gastric content. These systems also minimize the dose discharge and provide extend and controlled therapeutic effects. [4, 5]

In the present work an attempt was made to formulate floating microspheres of anti-hypertensive drugs for hypertension and angina pectoris, hence it is necessary to develop the formulation which will provide the sustained release of the drug there by reducing the dose of the drug.

MATERIALS AND METHODS

Nicardipine procured from Hetero Labs, Mahaboobnagar, Telangana, India. Locust Bean Gum, Gellan Gum, Eudragit S-100, Sodium Alginate and Other Chemicals were purchased from SD Fine Chemical, Mumbai, India. All solvents used were of analytical grade.

Fourier Transform Infrared Spectroscopy

FT-IR spectra for nicardipine and polymers were recorded using a fourier transform infrared spectrophotometer. The analysis is carried out in shimadzu-IR affinity spectrophotometer. The samples were dispersed alone or in combination in potassium bromide (KBr) and placed in the light path for recording IR spectra. The scanning range for IR was 400-4000 cm^{-1} and the resolution was 1 cm^{-1}.

Differential Scanning Calorimetry (DSC)

Differential scanning calorimetry studies were carried out using DSC 60, having TA60 software, shimadzu, Japan. Samples are accurately weighed and heated in sealed aluminum pans at a rate of 10°C/min between 25°C to 350°C temperature range under nitrogen atmosphere, aluminum pan are used as a reference. [6, 7]

Preparation of Floating Microspheres by Ionotropic Gelation method

Nicardipine Floating microspheres are prepared by using different polymers like Locust bean gum, gellan gum, Eudragit S-100, Eudragit L-100 and sodium alginate by ionotropic gelation method which involved reaction between sodium alginate and calcium chloride to produce a hydrogel network of calcium alginate. Accurately weighed ratio of polymers is added to the distilled water (10 ml) to form a homogenous polymer mixture by using magnetic stirrer. Nicardipine (100 mg) were added to the polymer mixer and mixed thoroughly with a stirrer to form a viscous dispersion. Sodium bi carbonate which acts as floating agent is added to the drug and polymer mixer and stirred. The above mixer is then added drop wise into calcium chloride (5%) solution through a 22G needle with continuous stirring at 200 rpm. The droplets are kept aside for 30 minutes in calcium chloride solution to produce rigid spherical microspheres. The microspheres obtained were filtered and washed thoroughly with distilled water to remove excess calcium chloride deposited on the surface of microspheres and then dried at room temperature. Same procedures were repeated for all other formulations. In this study, twelve formulations were prepared by different

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International Journal of Herbal Medicine
Available online at www.florajournal.com

E-ISSN: 2321-2187
P-ISSN: 2394-0514
IJHM 2019; 7(1): 08-10
Received: 06-11-2018
Accepted: 10-12-2018

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Development and evaluation of polyherbal emulgel formulation (A preventive hair care preparation)

M Ravi Kumar, Mangilal Teelavath and Shiva Kumar Yellanki

Abstract
The hair care polyherbal formulations were prepared in emulgel form by mixing the hydro alcoholic extract of four medicinal plants *Phyllanthus emblica* (*Phyllanthaceae*), *Centella asiatica* (*Apiaceae*), *Cucurbita pepo* (*Cucurbitaceae*), *Wedelia calendulacea* (*Asteraceae*), which are earlier reported to possess acclaimed hair growth promoting action. In this formulation carbopol 934 is used as gelling agent with herbal extracts. All formulations were evaluated for spreadability, viscosity, pH and Irritancy test. From the investigation, it can be concluded that the formulation of hair emulgel contain all good characters of an ideal emulgel and it was found to be harmless, more effective and economical.

Keywords: polyherbal formulation, hydroalcoholic extract, emulgel, carbopol

1. Introduction
The advantage of emugel topical delivery is to avoid first pass metabolism and avoids the risk of intravenous therapy. Topical delivery systems meant for cosmetic and skin diseases. Apart from advantages of gel, the major disadvantage is inability to deliver the hydrophobic drugs, to overcome this problem emulsion technology is recommended through gelling systems. Emugel is the water in oil or oil in water emulsion with active ingredient that incorporated in gelling agents, the system give the formulation more stability with desirable release of drugs [1, 2, 3].
The main object of present investigation to develop emugel system for hair care which consists polyherbal extract.

2. Materials and Methods
Carbopol, Span 80, Liquid paraffin, Triethanolamine, Methyl paraben, Propylene glycol, Rosemary oil, Castor oil, Lemongrass oil procured from Sisco research laboratories, Mumbai, India. Fresh fruits of *phyllanthus emblica*, leaves of *Centella asiatica*, *Wedelia calendulacea*, seeds of *cucurbita pepo* Collected from Local Area (cheeryal, Mechal Dist; Hyderabad).

2.1 Preparation of plant Extract
The fresh fruits of *phyllanthus emblica*, leaves of *Centella asiatica*, *Wedelia calendulacea*, seeds of *cucurbita pepo* were collected from nearby areas from cheeryal. The collected materials were shade dried and powdered, passed through mesh no 60, then subjected for maceration for 48 hrs with aqueous solvents. Collected powdered extracts were used for emugel preparation [4, 5].

2.2 Preparation of Emugel
Gels are transparent to opaque semi-solids containing a high ratio of solvent to gelling agent. The emulgel was formulated in three different steps [6, 7].
Step 1 Preparation of o/w emulsiuon.
Step 2 preparation of gel phase.
Step 3 Involves incorporation of emulsion into gel base with continuous stirring.

Gel was prepared by using various ratios carbopol 934 in queous solvent and stirring is applies on magenetic stirrer. Triethanolamine is added to maintain pH of all formulations. Oil phase is prepared by dossolvin span 80 in liquid paraffin and queous phase with extract in aqueous solvent. Methyl paraben was added as preservatiove. Oil and aqueous phases were preheated separately at 70°C to 80°C and both were mixed together and applied stirring until its get cool and gel formation.

RESEARCH ARTICLE

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Formulation and Evaluation of Buccal Mucoadhesive Patches for the Treatment of Hypertension

Shiva Kumar Yellanki[1*], Uday Kumar K[1], Teelavath Mangilal[1], M Ravi Kumar[1]

Abstract: Nimodipine is dihydropyridine calcium channel blocker, generally used for the treatment of high blood pressure. It has shown the good results in preventing major issues of subarachnoid hemorrhage (a form of cerebral hemorrhage) termed vasospasm; this is currently the main use of nimodipine. In the present study buccal drug delivery of nimodipine was developed. Matrix type of buccal patches was developed by using polymers HPMC K4M, HPMC K15M and HPMC K100M, sodium alginate and PVP K 30. Buccal patches were formulated by employing solvent casting method. Drug and excipient compatibility studies were implemented by using FTIR, DSC and no interaction was observed. Formulations were prepared with the different concentrations of polymers from the F1-F9, all the formulated patches were evaluated for the various physical parameters like physical appearance, flatness, thickness, weight variation, drug content, moisture absorption, moisture loss, swelling study, folding endurance and all the results were obtained within the pharmacopeial limits. In *in-vitro* drug release studies by using dialysis membrane, among all the 9 formulations F7 formulation which contain HPMC K100M 175 mg had shown 97.57% cumulative drug release within 12 hours. For F7 formulation release kinetics was plotted and the regression coefficient value was found to be high for Pappas release model was 0.991.

INTRODUCTION

The buccal mucosa provides readily accessible route for transmucosal delivery. Absorption through the buccal mucosa overcomes the early degradation of drug due to the pH of the gastro intestinal tract and enzyme activity and avoids active drug loss due to acid hydrolysis, presystemic metabolism, therapeutic plasma concentration of the drug can be rapidly achieved. The adhesive properties of such drug delivery platforms can reduce the enzymatic degradation due to the increased affinity between the delivery vehicle and the absorbing membrane. It has also been used as pharmaceutical excipients in conventional dosage forms as well as in novel applications involving bioadhesion and transmucosal drug transport. [1]

Transmucosal routes of drug delivery offer distinct advantages over per oral administration for systemic drug delivery. [2] These advantages include possible bypass of first pass effect, avoidance of presystemic elimination within the GI tract and depending on the drug, better enzymatic flora for drug absorption. [3]

Therefore, in the present study an attempt was made to formulate and evaluate nimodipine buccal mucoadhesive patches using various polymers.

MATERIALS AND METHODS

Nimodipine was supplied by NATCO pharmaceuticals, Hyderabad. HPMC K4M and HPMC K15M were purchased from Merck Specialities Pvt Ltd., Mumbai and all other materials were procured from S D Fine Chemical Ltd., Mumbai. All solvents used were of analytical grade.

Drug-Excipients Compatibility Studies

FT-IR spectroscopy was determined to find any physical and chemical interaction between the drug and other excipients used in the dosage form. FTIR spectrum was performed for the pure nimodipine powder and the optimized formulation. Samples were mixed with the KBr then pressed to form the disc. Then this disc was investigated using FTIR spectroscopy in the range 4000-400 cm^{-1}. [4] It is the leading thermal analysis technique. It is supposed that the thermal properties (melting point, change in enthalpy, etc.) of the individual components are compatible with each other. DSC scans were employed for the pure nimodipine powder and physical mixture of the drug and polymers (optimized formulation) of nimodipine buccal patch. The test was carried out by using a Shimadzu DSC apparatus with temperature range 50-300 and in a rate 10/min. DSC stands to benefit over other conventional techniques in requirement of short time of analysis and low sample consumption. [5]

Development of Buccal Patches

Buccal drug delivery patches were prepared by solvent casting method. HPMC K4M, HPMC K15M and HPMC K100M were weighed in requisite ratios and they were then dissolved in distill water as solvent using magnetic stirrer. Nimodipine (175 mg), Sodium alginate requisite and Poly ethylene glycol was added to the above dispersion under continuous stirring. The uniform dispersion was poured in the petri plate. The rate of evaporation of solvent was controlled by inverting cut funnel over the patches.

Total area of the petri dish was = 69.4 cm^2
Drug require in (2×2cm^2) = 10 mg
So total drug loaded = 175 mg.

Evaluation of Patches

1. Physical Appearance

This test Includes visual examination of the patches. [6]

2. Thickness

Three patches are randomly selected from the each formulation of different batches. And then the thickness of each patch was measured by screw gauge. [7]

3. Weight Variation

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RESEARCH ARTICLE

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Evaluation of Antiarthritic Activity of Ethanolic Extract of *Tradescantia spathacea*

Cheyala Sumalatha[1*], Banda Sandya[1], Jesetti Nagaraju[2], Ch Hari Prasad Murthy[3], Sunil Junapudi[1]

Abstract: The various extracts of *Tradescantia spathacea* were investigated for its anti-arthritic activity in male albino rats. Freund's adjuvant induced arthritis model was applied for the evaluation of anti-arthritic activity. Dexamethasone (0.1 mg/kg) was used as a regular drug. The ethanolic extract of *T. spathacea* exhibited significant anti-arthritic activity. The doses of 150 and 300 mg/kg of the ethanolic extract of *T. spathacea*, biochemical parameters assayed were rheumatoid factor, C-reactive protein (CRP), superoxide dismutase (SOD), catalase (CAT). The ethanol extract at the dose of 300 mg/kg body weight inhibited the rat paw edema, which is comparable with standard drug dexamethasone, inhibition of rat paw edema after 21 days. The results of the present investigation concluded, ethanol extract of *T. spathacea* possess a significant anti-arthritic activity against adjuvant induced arthritis and justifying its therapeutic role in arthritic condition.

INTRODUCTION

Tradescantia spathacea Swartz [syn. Rhoeo discolor L. H´er Hance, Rhoeo spathacea (Swartz) Stearn] is a plant of India that is in use in traditional medicine. This plant belongs to the Commelinaceae family. [1] In the Southeastern of Mexico, it is known as "Maguey Morado" (Purple Maguey) and the decoction of the leaves is daily free-consumed as curative of cancer, without existing scientific evidence of such property. [2] It is known that the aqueous extract of *T. Spathacea* blocks the antiadrenergic action of bretylium [3] and is contraceptive in rats. [4] The extracts of *T. Spathacea* have been incorporated in cosmetics to improve the appearance of skin. [5] Some chemicals detected in *T. Spathacea* are flavonoids, anthocyanins, saponins, carotenoids, waxes, terpenoids and coumarinic and steroidal compounds. [6, 7] On the other hand, *T. Spathacea* ethanolic crude extract evaluated in an *in-vitro* system, showed antioxidative activities [8] and antimicrobial Properties. [9] Due to the absence of scientific reports *in-vivo* that corroborate the antiarthritic activity property of *T. Spathacea*, it is evident the importance of the exploration of this plant.

MATERIALS AND METHODS

Drugs and Chemicals

Dexamethasone (GSN Pharmaceutical Limited, Kukatpally, Hyderabad, India) and Ethanol (Changshu Yangyuan Chemicals, China.) were used reference standards for antiarthritic activity.

Animals

Healthy adult albino wistar rats weighing 200-250 grams of either sex were chosen for the study. Animals were housed in appropriate cages in uniform hygienic conditions and fed with standard pellet diet (Amrul Laboratory Animal Diet) and water *ad-libitum*. They were fasted overnight before the day of test. Animals were housed within the departmental animal house and the room temperature was maintained at 27°C. Animal studies had approval of IAEC. An authority regulating animal experiments and was approved by the Institutional Animal Ethics Committee Reg. No. 1648/PO/A/12/CPCSEA formed as per CPCSEA guidelines.

Antiarthritic Activity

Freund's adjuvant induced arthritis [10] model was used to assess the anti-arthritic activity in albino rats. Animals were divided into five groups of six animals each. Male wistar albino rats weighing about 180-220 gm were used for this study. Group-I served as a control which received only the paraffin oil. Group-II Served as a negative control which received only the Complete Freund's adjuvant (0.1ml) only. Group-III Served as test group which received ethanolic extract of *T. Spathacea* (150 mg/kg, p.o.). Group-IV Served as test group which received ethanolic extract of *T. Spathacea* (300 mg/kg, p.o.). Group-V Served as positive control which received dexamethazone (0.100 mg/kg, p.o.). Arthritis was induced by injecting 0.05 ml of suspension of killed *Mycobacterium tuberculosis* bacteria (0.5% w/w) homogenized in liquid paraffin into the left hind paw. Drug treatment was started from the initial day i.e. from the day of adjuvant injection (0 day), 30 min before adjuvant injection and continued till 21st day. Paw volume was measured on 1st, 6th, 11th, 16th and 21st day with the help of whereby paw volume was measured using a volume transducer (model no.vt-2723) attached with strain gage coupler of Student Physio graph (model no. PG-02, INCO, Ambala, India). The mean changes in injected paw edema with respect to initial paw volume, were calculated on respective days and percentage inhibition of paw edema with respect to untreated group (control) was calculated. The changes in body weight were recorded daily. On the 22nd day, Blood was collected from tail vein and kept in room temperature for 1h and then centrifuged for 10 min to obtain serum. [11] The following serum biochemical parameters were assayed. Rheumatoid factor, C - reactive protein (CRP), Superoxide dismutase (SOD), Catalase (CAT), Lipid.

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Print ISSN: 2319-2003 | Online ISSN: 2279-0780

International Journal of Basic & Clinical Pharmacology

DOI: http://dx.doi.org/10.18203/2319-2003.ijbcp20183917

Original Research Article

A study on adverse drug reactions in patients on antiretroviral therapy in a tertiary care hospital

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Received: 10 August 2018
Accepted: 31 August 2018

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ABSTRACT

Background: Besides unparalleled advantages, exceptionally dynamic antiretroviral treatment is additionally connected with extensive variety of potential adverse drug reactions (ADRs), which prevents treatment adherence. The present study is intended to screen and monitor the event of ADRs to different antiretroviral treatment (ART) regimens in a tertiary care ART setup.

Methods: A prospective, longitudinal observational study was done in the outpatient setting of nodal ART center, Osmania General Hospital. A sum of 525 patients on different ART regimens were examined for ADRs more than year and a half. Adverse event history, prescription history and other significant subtle elements were captured. Causality and seriousness of each announced ADR were surveyed.

Results: 37.33% patients of aggregate members gave a sum of 330 ADRs. Patients from zidovudine-based regimens presented with majority of ADRs such as anemia, central nervous system (CNS), and gastrointestinal (GI) side effects. Tenofovir-based regimens were, be that as it may, observed to be somewhat more secure. The blend with Efavirenz was related with significant CNS reactions while that of Nevirapine was related with rash and pigmentation of nails. Atazanavir supported second-line regimens were quite connected with expanded serum lipid levels taken after by other GI and CNS unfavourable impacts. Expanded liver compounds were found in atazanavir-based second-line ART.

Conclusions: The study enables to obtain in sequence on the incidence and pattern of ADRs associated with various antiretroviral regimens, thereby reducing its occurrence and protecting the patient population from avoidable harm. Need of intensive monitoring for ADRs in ARTs along these lines is by all accounts an order.

Keywords: Antiretroviral, Adverse drug reactions, Human immunodeficiency virus, Tertiary care

INTRODUCTION

The human immunodeficiency infection (HIV) disease keeps on being a serious worldwide medical problem. Late measurements express that there were around 2.4 million new instances of HIV in 2017. Of around 36.9 million individuals living with HIV (PLHIV) around the globe, around 21.7 million individuals have been getting antiretroviral treatment (ART).[1] The presentation of this treatment in the created nations in the late 90s and the ensuing advancement in giving its availability all around has been related with a striking abatement in AIDS-related mortality, which has changed the standpoint of HIV infection from being a quickly lethal to an incessantly reasonable infection.[2,3] Antiretrovirals mainly suppress viral load, in this way re-establishing the insusceptible capacity. Declining expenses of antiretrovirals alongside the generation of medications by bland producers has helped tertiary care centers in resource limited territories

137

Original Article

ANTIBIOTIC USE IN PEDIATRIC INFECTIONS; A STUDY IN TERTIARY CARE HOSPITAL

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ABSTRACT

Objectives: Antibiotics are frequently used in tertiary care hospitals. We conducted an observational study on children admitted to a teaching hospital in south India, to make a profile of antibiotics use and suspected adverse drug reactions (ADRs) owing to them. **Methods:** Hospitalized children of either sex, aged between 1 month and 12 years, were inspected. Baseline demographic and clinical features, duration of hospital stay, antibiotics received in hospital along with dosing and indications and interest of suspected ADRs attributable to their use were recorded. Every patient was followed up till discharge, admission to the Pediatric Intensive Care Unit, or passing. **Results:** Over the year and a half report period 364 confirmations were screened. The prevalence of Antibiotics use was 80.22%. The majority of the 292 children who received Antibiotics were males (63.35%). Median age was 35 months, five children died. In most instances, either two (41%) or a single antibiotic (37.32%) was used. Ceftriaxone, co-amoxiclav, amikacin, vancomycin, and ampicillin were predominantly used. Antimalarials, antivirals and antiprotozoals were used occasionally. Average number of Antibiotics per patient was 2.2± 1.1 the majority (81.15%) were by parenteral route and initial choice was usually empirical. Prescriptions were usually in generic name. The antibiotic treatment went somewhere in the range of 1 and 32days, with a middle of 8 days. Five ADRs were noted of which half were skin rash and the rest loose stools. **Conclusions:** The profile of Antibiotic utilize is comprehensively like prior Indian investigations. Apparent overuse of multiple Antibiotics per prescription and the parenteral route requires exploration. Antibiotics are being used empirically in the absence of policy. ADRs to Antibiotics are occasional and usually mild. The benchmark information can serve in situation analysis for antibiotic prescribing guidelines.

KEYWORDS: Antibiotic; Pediatric infections; Adverse drug reactions; Tertiary care hospital.

INTRODUCTION

This is evidenced by the WHO report where it was exhibited that in creating nations, half of all popular upper respiratory tract diseases and viral infection cases got anti-infection agents improperly while just 70% of all pneumonia cases, which warrant anti-infection treatment, antibiotics[1]. This inappropriate antibiotic utilize has numerous outcomes including serious morbidity and mortality coming about because of wrong dose, antagonistic medication response, and expanded Antibiotic obstruction coming about because of abuse of anti-infection agents. In 2011, the WHO expressed "if no action today, no cure tomorrow"[2] in an effort to emphasize to the consequence of the widespread and inadvertent use of antibiotics and the need for immediate action to preserve antibiotics for future use.

DOI: 10.31878/ijcbr.2018.44.06

eISSN: 2395-0471
pISSN: 2521-0394

Infectious diseases represent a major cause of morbidity and mortality in India and are responsible for a large proportion of hospital admissions, particularly in children. Antibiotics and other Antibiotics, therefore, constitute an important category of drugs, both in the community and in hospitals. There is considerable evidence linking indiscriminate use of Antibiotics to altered susceptibility patterns among infectious organisms and often frank resistance[3]. We face huge challenges in rational use of Antibiotics starting with general lack of awareness and unsatisfactory levels of personal hygiene and environmental sanitation to lack of surveillance mechanisms for monitoring Antibiotic use and resistance, mostly empirical use of antibiotics due to dearth of microbiology laboratory support, absence of or ineffective antibiotic use policies in most healthcare settings and nonhuman use of Antibiotics [4-6].

The nature and pattern of Antibiotic prescribing changes with time as spectrum of pathogens change and new Antibiotics are introduced. In India, Antibiotics may account for 50% of total value of drugs sold, but the prevalence of Antibiotic use has varied across surveys [7]. With widespread use of antibiotics, the prevalence

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RESEARCH ARTICLE

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MATERIALS AND METHODS

Drugs and Chemicals

Dexamethasone (GSN Pharmaceutical Limited, Kukatpally, Hyderabad, India) and Ethanol (Changshu Yangyuan Chemicals, China.) were used reference standards for antiarthritic activity.

Animals

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2018 pep 26424 © Inventi Journals (P) Ltd
Published on Web 27/07/2018, www.inventi.in

Int. J. Pharm. Sci. Rev. Res., 53(1), November - December 2018; Article No. 01, Pages: 1-3 ISSN 0976 – 044X

Review Article

A Review on Biogeography and Evolution of *Schistosoma*

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Received: 16-09-2018; **Revised:** 22-10-2018; **Accepted:** 02-11-2018.

ABSTRACT

Schistosoma is a genus which infects by parasitic trematode worms commonly known as blood flukes. They are highly responsible to cause infections in humans majorly in the regions African and Asian origins especially in rural areas in agricultural land, inland fisheries. The origin of *schistosoma* was unclear, but was believed that this genus origin was from Africa where its genus DNA species infect hippo could be basal in the era of Cenozoic. In the earlier, it was first mentioned from 2000-1000 BC in ancient Egyptian Papyri. According to Davis, *schistosoma* genus was aroused in Gondwanland before 150 years ago based on phylogenetics of the pomatiopsid host snails. Gondwanan separated into Africa, South America, Antarctica and Australia. Asia as India separated from Africa and identified *S. japonicum* and *S. indicum* which were demonstrated by analyzing DNA sequence, mitochondrial gene order and C-banding patterns. From Africa *S. mansoni* was identified during Holocene and transmitted to South America by slave trade and understood by lineage specific gene duplications. Genus *Schistosoma* in the form of *Orientobilharzia turkestanicum* primarily hosts in the cattle, sheep, goat and Cashmere goat. Some other genus Schistosoma also appears in the form of *Bivetellobilarzia* which hosts in an elephant. *S. incognitum* and *S. nasale* are closely related to the African species rather than japanicum group. During the time of Pliocene *S. sinensium* appears to radiate and in the Mid-Pleistocene, *S. mekongi* appears to have invaded in South East Asia.

Keywords: Evolution, biogeography, *Schistosoma*, Gondwanland, hippo, snail.

INTRODUCTION

Schistosoma is a genus which causes parasitic infectious disease by trematode worms, chiefly in tropical regions. It is also commonly known as blood flukes. Trematodes are parasitic flatworm responsible for a highly significant group of infections in humans which can be termed as Schistosomiasis. It is also called with the term as *Bilharzia*.[1]

Depending on the type of infecting species adult flatworms infest in blood capillaries of mesenteries and the plexus of the bladder. They are unique trematodes and they are dioecious, with distinct sexual dimorphism between male and female. The eggs are released in thousands and reach either in bladder or intestine and these are then excreted in urine or feces as according to the infecting species. The larvae then pass in snail as an Intermediate host. The same larvae parasite may also emerge into a new mammalian host by directly penetrating into the skin.[2]

Some ponds and rivers as much as thousands can be found in a square meter. They are the freshwater snails belonging to the genus *Bullnus*, in which they act as specific hosts to the larval stages of the *Schistosoma haematobium* worm.[2]

The miracidium is a young form of life is attracted by the mucous secretion of snail and burrows into the soft tissue of the mollusc. The miracidium transforms on its own into sporocysts which are meant to be as sowing, seed and sack, which gives rise to daughter sporocysts. A single miracidium may produce thousands of cercariae in a few weeks and this production may carry in the snail for months.

In the pond of El Mamoun, water was teeming with this kind of microscopic life when the tourists arrived at the oasis. Previous visits to the oasis by Bedouins had left the pond infected, a legacy of the disease was spreaded to the tourists to contract. When divers jump from their boats, the cercariae are stimulated by the high temperature and bright light of the day, abandon the snails. Under the microscope, it appears like miniature tadpoles with a pear-shaped buoy and a long tail ending in a y-shaped fork which acts as a propeller to move the organism through the water. They swim in a desperate race searching for a human host to ensure their survival. Cercariae attract by the lubricating oily secretion of the human body, they then attach themselves to the skin with their oral suckers. They do not need to find a wound or break in the skin since they secrete an enzyme which splits the 'cement' holding the cells of the skin together and penetrates into the skin by shedding their tails.[2]

HOST RANGE

Schistosomes are the parasites of human and animal, which is spread throughout Africa, Asia, and South America, especially in rural areas such as agricultural land and inland fisheries. Distribution of parasite is linked to that of their intermediate hosts in the snail, which differ in their habitual preferences for slow-flowing or still waters. Many activities of human showed an influence in

International Journal of Pharmacy and Pharmaceutical Sciences

ISSN- 0975-1491

Vol 10, Issue 12, 2018

Case Study

HENOCH-SCHONLIEN PURPURA ASSOCIATED WITH HEPATITIS C AND COMPENSATED CIRRHOSIS

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Received: 10 Sep 2018 Revised and Accepted: 27 Oct 2018

ABSTRACT

An unordinary case report of henoch-schonlein purpura (HSP) in a relationship with hepatitis C and compensated cirrhosis was identified in 14 y aged male patient. He was admitted in the pediatric department with stomach pain, yellow skin, rashes with tingling and erythematous injuries over the legs with agony and swelling since multi-day. He feels pain during walking and appears to be with swelling of lower leg muscles. His unusual liver function test was distinguished with elevated levels of bilirubin-3 mg/dl, basic phosphatase-314 U/l, aspartate aminotransferase-55 U/l and alanine aminotransferase-60 U/l. His skin biopsy shows up leukocytoclastic vasculitis and IgA depositions. Liver biopsy revealed nuclei enlargement with extensive cell change and scattered cell plates. His blood test was with the presence of the hepatitis C virus (HCV) antibodies. He was finally diagnosed as HSP associated with HCV and compensated cirrhosis.

Keywords: Henoch-schonlein purpura, Hepatitis C, Immunoglobulin A, Compensated cirrhosis, Erythematous lesions

DOI: http://dx.doi.org/10.22159/ijpps.2018v10i12.29676

INTRODUCTION

HSP portrayed by generalized vasculitis [1]. HSP is characterized by non-thrombocytopenic palpable purpura, arthritis or arthralgias, gastrointestinal and renal involvement [2]. Inflammation also involves the blood vessels of the skin, lungs and focal sensory system with a mind-boggling store of immunoglobulin A (IgA) [3, 4] influencing transcendently in children [5]. HSP builds up the indications of rash, particularly finished legs, stomach pain, subcutaneous oedema, joint pain and glomerulonephritis [6]. HSP can influence any organ, physical examination observations are required. An exact reason for the cause of HSP is not known, but it is believed to be multifactorial, with hereditary, natural, and antigenic parts [7, 8]. It is difficult to distinguish by skin biopsy, which can show leukocytoclastic vasculitis and IgA depositions [9].

HCV is a major cause of liver disease and the potential cause of substantial morbidity and mortality worldwide [10]. Hepatitis C caused by HCV can be analyzed by the discovery of immunizing to HCV in the blood test by the immunoassay method [11] and identification of IgM antibodies against hepatitis C infection antigens [12]. HCV disease can do significant damage to the liver and leads to cirrhosis. It's not surprising that numerous individuals with hepatitis C don't know they have a life-threatening disease which can lead to liver cirrhosis. There are two phases of cirrhosis 1. **Compensated cirrhosis** means the body still functions despite decreased liver function and scarring. 2. **Decompensated cirrhosis** implies that body functions are separated where serious side effects like kidney failure, variceal haemorrhage, and hepatic encephalopathy may occur. Indications of cirrhosis are because of hepatitis C are fatigue, nausea, loss of appetite, weight reduction, wounding, itchy skin, jaundice, swelling in legs, ascites, hepatorenal disorder [13].

A few studies reveal hepatitis C associated IgA/IgM mixed cryoglobulinaemia can't be ruled out regardless of a negative cryoglobulin screen [14] on two occasions. In this patient, an IgA mediated vasculitis may have been the nidus for thrombus development and abdominal catastrophe. The role of liver cirrhosis in the advancement of HSP is fascinating. Patients may create HSP as because of an impact of abnormal liver metabolism of IgA circulating immune complexes that is an impaired clearance of IgA complex in liver cirrhosis resulting about tissue depositions [15, 16], despite the fact that this is known to occur without overt vasculitis [16]. This mechanism appears to be in this case. The preceding HCV might have contributed to the formation of the immune complex.

There is no particular treatment for HSP. Acetaminophen or NSAIDs can be used for pain management and some of the time corticosteroids may also be used [17].

CASE REPORT

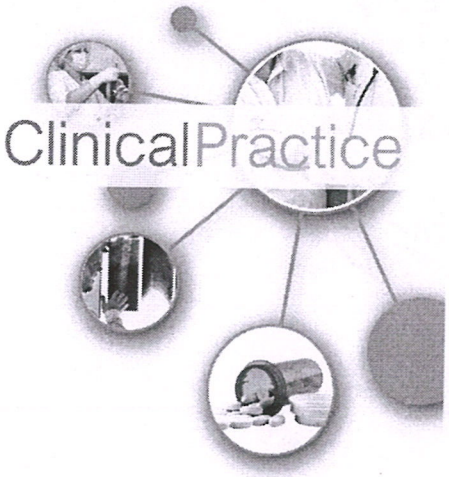
A male patient, aged 14 y admitted in the pediatric department with chief complaints of the stomach pain, yellow skin, rashes with tingling and erythematous sores over the legs with pain and swelling since one day. He feels pain during walking and appears to be swelling of lower leg muscles. There is no history of rash after food consumption, medicine use, insect bite, and there is no cough and swelling of the neck to the patient. His birth and improvement history was observed to be normal. Physical examinations, biochemical reports, complete blood picture and urine examinations seem to be normal. Peripheral smear test and ASO tube test were negative. His liver function test was observed to be elevated levels of total bilirubin-3 mg/dl, alkaline phosphatase-314 U/l, aspartate aminotransferase-55 U/l and alanine aminotransferase-60 U/l. His skin biopsy exhibits leukocytoclastic vasculitis with IgA depositions. Liver biopsy reveals nuclei enlargement with large cell change and disorganized cell plates. His blood test was positive with the presence of antibodies to HCV. He was finally diagnosed as HSP to have hepatitis C and compensated cirrhosis.

The patient was treated with IV ceftriaxone 1.125g+tazobactam 500 mg, IV netilmicin 50 mg BD, IV ranitidine 50 mg BD, IV pheniramine 1.5 cc BD, IV dexamethasone 1cc BD, tablet paracetamol 500 mg, tablet calcium, syrup multivitamin. He was counselled with a way of lifestyle changes in diet aspects.

DISCUSSION

An uncommon case report HSP association with hepatitis C and compensated liver cirrhosis were identified in a pediatric department. A male patient aged 14 y admitted in the pediatric department with stomach pain, yellow skin, rashes with rashes and erythematous injuries over the legs with pain and swelling since one

CASE REPORT



Leiomyoma at gastroesophageal junction causing uncontrolled hypertension and arrhythmia

Abstract

A case of leiomyoma at gastroesophageal (GE) junction was identified in a male patient with uncontrolled hypertension and arrhythmia. Patient came with chief protestations of body pains, burping, stomach pain and uncontrolled hypertension. He was with oral medications like amlodipine 5 mg, pantoprazole 40mg, clopidogrel 75 mg, vitamin supplements and syrup antacid. His blood pressure was 150/100 mmHg. He has elevations of direct bilirubin-0.03mg/dl and basic phosphate-192U/L. Esophagus endoscopy determines 23 × 22 mm size mixed echoic lesion with deformed cells at GE junction. His ECG demonstrates cardiac arrhythmias. Endoscopic ultrasonography and cardiac MRI identifies a mass from the submucosal layer at GE junction compressing the esophageal veins. Fibroids at GE junction were removed by thoracoscopy. Histopathological examination confirms leiomyoma with an impression of round mass lesion composed of bundle of spindle cells arranged like braid with minimal abnormal and enlarged nuclei. To his previous prescription ceftriaxone 500 mg and ibuprofen 400 mg were included.

Key words: Leiomyoma, uncontrolled hypertension, arrhythmia, gastroesophageal junction, mixed echoic lesion, stomach pain

Introduction

Leiomyoma, also called as fibroids, represent to a hyperproliferation of interweaving bundles of benign smooth muscle cells which leads to tumor formation that may infrequently progress cancer (0.1%) [1]. Fibroids normally emerge as intramural developments, most regularly along the distal two-thirds of the esophagus [2]. The symptoms of leiomyoma resemble epigastric pain, heartburn, regurgitation, epigastric discomfort, nausea and vomiting, abdominal bloating, and eructation [3]. Esophageal leiomyoma significantly begins from muscularis mucosa or muscularis propria found to develop in distal and middle thirds of the esophagus [4].

Enzymes such as alkaline phosphatase (ALP), acid phosphatase (ACP) and aspartate transaminase (AST) can be used as tumor marker [5]. Tumor markers are produced in small concentration by normal cells but increase its concentration when produced by tumor cells [6].

Endoscopic ultrasonography is viewed as the best technique for the determination of sub-mucosal lesion [7,8] which finds the size of leiomyoma and some study reports says endoscopic ultrasonography distinguishes the exact presence of homogeneous and hypoechoic sore with a clear margin in the five-layered structure of gastrointestinal wall [9,10]. Cakar et al revealed a patient with esophageal leiomyoma giving dynamic dyspnoea and fatigue; echocardiogram, CT scan and cardiac MRI showed extrinsic left atrial compression and impaired left atrial filling that was relieved after enucleation of the mass through thoracotomy [11]. Kang SK et al detailed a pathological examination of fibroid which it was appeared as circumscribed lesion composed of intersecting fascicles of bland spindle cells with the abundant cytoplasm of smooth muscle cells which are of the spindle type arranged as braids. These spindle tumor cells have blunt elongated nuclei and show a minimal atypia [12].

A few studies show esophageal leiomyomas presents with serious and uncontrolled hypertension. Kang SK et al additionally shows leiomyomas in the distal esophagus can turn into a large size and press on the cardia of the stomach [12]. A study report shows esophageal vein compression involves in the activation of sympathetic nervous system with

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Clin. Pract. (2018) 16(1), 1031-1034

ISSN 2044-9038

International Journal of Pharmacy and Pharmaceutical Sciences

ISSN- 0975-1491 Vol 10, Issue 12, 2018

Case Study

HENOCH-SCHONLIEN PURPURA ASSOCIATED WITH HEPATITIS C AND COMPENSATED CIRRHOSIS

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Received: 10 Sep 2018 Revised and Accepted: 27 Oct 2018

ABSTRACT

An unordinary case report of henoch-schonlein purpura (HSP) in a relationship with hepatitis C and compensated cirrhosis was identified in 14 y aged male patient. He was admitted in the pediatric department with stomach pain, yellow skin, rashes with tingling and erythematous injuries over the legs with agony and swelling since multi-day. He feels pain during walking and appears to be with swelling of lower leg muscles. His unusual liver function test was distinguished with elevated levels of bilirubin-3 mg/dl, basic phosphatase-314 U/l, aspartate aminotransferase-55 U/l and alanine aminotransferase-60 U/l. His skin biopsy shows up leukocytoclastic vasculitis and IgA depositions. Liver biopsy revealed nuclei enlargement with extensive cell change and scattered cell plates. His blood test was with the presence of the hepatitis C virus (HCV) antibodies. He was finally diagnosed as HSP associated with HCV and compensated cirrhosis.

Keywords: Henoch-schonlein purpura, Hepatitis C, Immunoglobulin A, Compensated cirrhosis, Erythematous lesions

DOI: http://dx.doi.org/10.22159/ijpps.2018v10i12.29676

INTRODUCTION

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An uncommon case report HSP association with hepatitis C and compensated liver cirrhosis were identified in a pediatric department. A male patient aged 14 y admitted in the pediatric department with stomach pain, yellow skin, rashes with rashes and erythematous injuries over the legs with pain and swelling since one

Review Article

A Review on Biogeography and Evolution of *Schistosoma*

Sagar Pamu[1*], Lakshmi Thakkalapally[2], Naresh Devarakonda[3], Mohammed Abubakar[4]

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Received: 16-09-2018; **Revised:** 22-10-2018; **Accepted:** 02-11-2018.

ABSTRACT

Schistosoma is a genus which infects by parasitic trematode worms commonly known as blood flukes. They are highly responsible to cause infections in humans majorly in the regions African and Asian origins especially in rural areas in agricultural land, inland fisheries. The origin of *schistosoma* was unclear, but was believed that this genus origin was from Africa where its genus DNA species infect hippo could be basal in the era of Cenozoic. In the earlier, it was first mentioned from 2000-1000 BC in ancient Egyptian Papyri. According to Davis, *schistosoma* genus was aroused in Gondwanland before 150 years ago based on phylogenetics of the pomatiopsid host snails. Gondwanan separated into Africa, South America, Antarctica and Australia. Asia as India separated from Africa and identified *S. japonicum* and *S. indicum* which were demonstrated by analyzing DNA sequence, mitochondrial gene order and C-banding patterns. From Africa *S. mansoni* was identified during Holocene and transmitted to South America by slave trade and understood by lineage specific gene duplications. Genus *Schistosoma* in the form of *Orientobilharzia turkestanicum* primarily hosts in the cattle, sheep, goat and Cashmere goat. Some other genus Schistosoma also appears in the form of *Bivetellobilarzia* which hosts in an elephant. *S. incognitum* and *S. nasale* are closely related to the African species rather than japanicum group. During the time of Pliocene *S. sinensium* appears to radiate and in the Mid-Pleistocene, *S. mekongi* appears to have invaded in South East Asia.

Keywords: Evolution, biogeography, *Schistosoma*, Gondwanland, hippo, snail.

INTRODUCTION

Schistosoma is a genus which causes parasitic infectious disease by trematode worms, chiefly in tropical regions. It is also commonly known as blood flukes. Trematodes are parasitic flatworm responsible for a highly significant group of infections in humans which can be termed as Schistosomiasis. It is also called with the term as *Bilharzia*.[1]

Depending on the type of infecting species adult flatworms infest in blood capillaries of mesenteries and the plexus of the bladder. They are unique trematodes and they are dioecious, with distinct sexual dimorphism between male and female. The eggs are released in thousands and reach either in bladder or intestine and these are then excreted in urine or feces as according to the infecting species. The larvae then pass in snail as an intermediate host. The same larvae parasite may also emerge into a new mammalian host by directly penetrating into the skin.[2]

Some ponds and rivers as much as thousands can be found in a square meter. They are the freshwater snails belonging to the genus *Bulinus*, in which they act as specific hosts to the larval stages of the *Schistosoma haematobium* worm.[2]

The miracidium is a young form of life is attracted by the mucous secretion of snail and burrows into the soft tissue of the mollusc. The miracidium transforms on its own into sporocysts which are meant to be as sowing, seed and sack, which gives rise to daughter sporocysts. A single miracidium may produce thousands of cercariae in a few weeks and this production may carry in the snail for months.

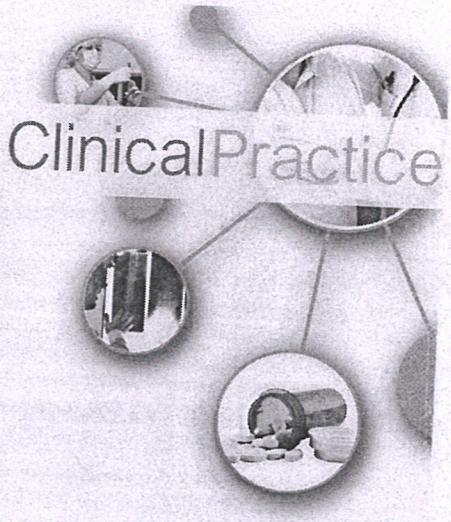
In the pond of El Mamoun, water was teeming with this kind of microscopic life when the tourists arrived at the oasis. Previous visits to the oasis by Bedouins had left the pond infected, a legacy of the disease was spreaded to the tourists to contract. When divers jump from their boats, the cercariae are stimulated by the high temperature and bright light of the day, abandon the snails. Under the microscope, it appears like miniature tadpoles with a pear-shaped buoy and a long tail ending in a y-shaped fork which acts as a propeller to move the organism through the water. They swim in a desperate race searching for a human host to ensure their survival. Cercariae attract by the lubricating oily secretion of the human body, they then attach themselves to the skin with their oral suckers. They do not need to find a wound or break in the skin since they secrete an enzyme which splits the 'cement' holding the cells of the skin together and penetrates into the skin by shedding their tails.[2]

HOST RANGE

Schistosomes are the parasites of human and animal, which is spread throughout Africa, Asia, and South America, especially in rural areas such as agricultural land and inland fisheries. Distribution of parasite is linked to that of their intermediate hosts in the snail, which differ in their habitual preferences for slow-flowing or still waters. Many activities of human showed an influence in

CASE REPORT

Leiomyoma at gastroesophageal junction causing uncontrolled hypertension and arrhythmia



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INTERNATIONAL JOURNAL OF PHARMACEUTICAL CHEMISTRY

Synthesis and antimicrobial activity of chalcones and pyrazolines

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DOI: https://doi.org/10.7439/ijpc.v7i8.4348

ABSTRACT Chalcones are 1,3-diphenyl-2-propene-1-one, in which two aromatic rings are linked by a three carbon ?,?-unsaturated carbonyl system. They have displayed a broad spectrum of biological activities. In this view it was proposed to synthesize some novel pyrazolines from chalcones. Chalcones are prepared by treating 2-acetyl-5-bromothiophene with different aromatic compounds. These chalcones on condensation with phenyl hydrazine HCl. pyridine as a catalyst gave 3-(5-bromothiphene-2yl)-1-phenyl-1H-pyrazole derivatives. The synthesized compounds have been characterized by their melting point, TLC, IR and 1H NMR spectral data. They have been screened for their antibacterial activity against Gram positive bacteria B.subtillis and B.pumilus and Gram negative bacteria E. coli and P.vulgaris and antifungal against A.niger and p.crysogenium .

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E-ISSN: 0975-8232; P-ISSN: 2320-5148

IJPSR (2018), Volume 9, Issue 8

(Research Article)

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 11 November, 2017; received in revised form, 24 April, 2018; accepted, 13 May, 2018; published 01 August, 2018

DRUG UTILISATION EVALUATION OF ANTI HYPERTENSIVE DRUGS IN CHRONIC KIDNEY DISEASE PATIENTS

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Keywords:

CKD, JNC 7, KDOQI, Hypertension, Diabetes, DUE

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ABSTRACT: Objective: To assess the drug utilization evaluation of antihypertensive agents in diabetic and non-diabetic patients with chronic kidney disease. **Method:** Retrospective observational study was conducted in inpatient Nephrology department of B.B.R. Hospital from Sep 2016 to Feb 2017 and 155 case records of patients diagnosed with CKD and HTN, above 18 yrs of age, belonging to both genders were collected. Required Information from the patient's case sheets was collected using a well designed data collection form. **Results:** The prevalence of CKD is more in male than in female and most commonly age group of > 60 yr was affected with CKD. Our study showed that majority of patients needed multiple drug therapy to control hypertension. Diuretics were most commonly prescribed drugs. The preferable drugs given among anti-hypertensive were diuretics, calcium channel blockers, beta blockers, alpha blockers, ARB'S. **Conclusion:** Most of the CKD patients were Male (63.87%) in distribution. Of the 155 cases, 69.03% of patients were also suffering from diabetic. Majority of patients (both diabetic and non-diabetic hypertensive patients with CKD) were prescribed with Diuretics (40.71%), of which Furosemide (31.12%) was predominantly seen. 65% of prescribed drugs were brand name drugs. Polypharmcy was observed in most of the prescriptions.

INTRODUCTION: Chronic kidney disease is characterized by progressive destruction of renal mass with irreversible sclerosis and loss of nephrons over a period of months to years [1]. It is estimated that one out of 10,000 people suffer from CKD in India and around 100 thousand new patients develop ESRD in India annually.

Approximately 1 of 5 adults with high blood pressure has CKD and medical care for CKD patients is complex, due to widespread co-morbidities and major risk factors for CKD [2].

The most common risk factors and other characteristics among the subjects diagnosed with CKD were hypertension (64.5%), anaemia (40.7%) and diabetes (31.6%) [3]. CKD develops in about third of patients with diabetes, and while in people with treated essential hypertension, CKD is present in a small percentage of patients [4]. Hypertension is the most important modifiable risk factor for coronary heart disease, stroke (the third leading cause of death), congestive heart failure, end-stage

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.9(8).3480-86

Article can be accessed online on: www.ijpsr.com

DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.9(8).3480-86

CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.2656643

Available online at: http://www.iajps.com Research Article

PREPARATION AND EVALUATION OF TAPENTADOL MOUTH DISSOLVING TABLETS

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Article Received: February 2019 **Accepted:** March 2019 **Published:** April 2019

Abstract:
Mouth dissolving tablets are solid dosage forms containing tapentadol as active pharmaceutical ingredient which has analgesic effect, and has superdistegrants like croscarmellose sodium and starch glycolate which disintegrates fast usually less than 60 seconds without the need of water when placed on the tongue. To prepare and evaluate tapentadol mouth dissolving tablet by using direct compression method and to determine the effect of formulation process and the excipients. Tapentadol MDT were formulated by using ingredients and superdisintegrants like sodium starch glycolate and cross carmellose.The resulting tablets were evaluated using parameters such as: hardness, friability, disintegration time in vitro, modified disintegration time, disintegration time in the oral cavity, wetting time, water absorption ratio, drug content determination, weight uniformity, and dissolution. The results showed that tapentadol mouth dissolving Tablets fulfilled the requirements for all parameters except for F1 formula that did not produce physical shape intact tablet. MDT s used higher amount of crosscarmellose showed faster disintegration time. FTIR studies and calibration curve show there is interaction between drug and excipients tablet hardness were also higher. In vitro drug release of all formulation MDTS showed fast drug release with in few sec. The study reveals that formulations prepared by direct compression F3 exhibits highest dissolution using cross carmallose sodium showed faster drug release 90.15% over the period of 50min while disintegration time of the tablet was showed 50sec in comparison to other formulations of tapentadol.

Keywords: *sodium starch glycolate,crosscarmellose sodium, disintegration tapentadol mouth dissolving tablets.*

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Please cite this article in press Shiva Kumar et al., ***Preparation and Evaluation of Tapentadol Mouth Dissolving Tablets.,*** *Indo Am. J. P. Sci, 2019; 06(04).*

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125

International Journal of Pharmacy and Biological Sciences
ISSN: 2321-3272 (Print), ISSN: 2230-7605 (Online)
IJPBS™ | Volume 8 | Issue 4 | OCT-DEC | 2018 | 915-926
Research Article | Pharmaceutical Sciences | Open Access | MCI Approved| ज्ञान-विज्ञान विमुक्तये
|UGC Approved Journal |

PREPARATION AND *INVITRO* EVALUATION OF HIGHLY POROUS GASTRORETENTIVE FLOATING BECLOMETHASONE DIPROPIONATE TABLETS

Ramya Bhanu.B[1*], Mangilal.T[1], Ravi Kumar.M[1] and Naveen.J[1]

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ABSTRACT

The present study is aimed to formulate floating gastro retentive (GR) tablets containing beclomethasone dipropionate using a sublimation material for prolongation of gastric residence time. Three different ratios of hydroxyl propyl methyl cellulose (HPMC) K4M is used in three different methods for the preparation of tablets. In this case, the drug release from tablet was highly dependent on the polymer concentrations. Camphor, the sublimation material is used in the preparation of GR tablets. Camphor changes to pores in the tablet during the sublimation process. As the camphor gets sublimed, floating properties and density of tablets were affected by the sublimation of camphor. Gastro retentive floating beclomethasone dipropionate tablets which were prepared floated for over 24 hrs and had no floating lag time. Therefore, as the concentration of camphor in the tablet matrix increases, the hardness of the tablet decreased after sublimation. Release profiles of the drug from the GR tablets were not affected by tablet density or porosity.

KEY WORDS

Beclomethasone Dipropionate, gastro retentive floating tablets, HPMCK4M, sublimation method.

INTRODUCTION

The principle and more advisable route for delivering a drug is the oral route, but in case of physiological variability like gastro intestinal transit and GRT there is a major problem. The controlled oral drug delivery of GRT is always less than 12h, and it plays a vital role in complete dosage form transit [1, 3]. These characteristics lead to evolution of a drug delivery system that retains in the stomach for a prolonged and predictable time [2].

Floating drug delivery systems (FDDS) have low bulk density than that of gastric fluids. Due to their lower densities, FDDS float above the gastric content without effecting gastric emptying rate for longer duration of time and it provides controlled release of drug [3]. These systems have been extensively used because there are no interactions in relation to the motility of the GIT and a large number of floating dosage forms commercialized and marketed worldwide. Two systems have been used in the development of FDDS, on the basis of mechanism of buoyancy. They are effervescent systems and non-effervescent system In Effervescent systems effervescent substances like carbonate/ bicarbonate salts and citric / tartaric acids are used to liberate Co_2. The liberated Co_2 is entrapped in the jellified hydrocolloid layer of the systems thus specific gravity is decreased and it is made to float above gastric content [4, 5].

In Single Layer Floating Tablets or Hydrodynamically Balanced System (HBS), Co_2 generating agents and the drug were mixed thoroughly within the matrix tablet to produce a formulation. And to remain buoyant in the stomach without effecting the gastric emptying rate for a prolonged period of time. The drug is released slowly at a desired rate [6, 8]. When the drug is completely released the system is expelled out from the stomach

EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 5
Issue: 9
465-471
Year: 2018

PREPARATION AND EVALUATION OF RIZATRIPTAN SUBLINGUAL TABLETS BY USING SUPERDISINTEGRANTS

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Article Received on 15/07/2018 **Article Revised on 06/08/2018** **Article Accepted on 27/08/2018**

ABSTARCT
The present aim of study is to formulate and evaluate Sublingual tablets of Rizatriptan. Super disintegrating agents like Sodium starch glycolate, Gellan gum, and Croscarmellose sodium were employed has to increase the solubility and dissolution rate of the Rizatriptan drug molecule. Formulation of sublingual tablets was carried out by using direct compression method in 8 station rotary punching machine with a 6mm punch for all formulations. The mixture of nine formulations was passed Pre-compression and Post-compression parameters and they passed all the quality control parameters as per IP limits. The FTIR and DSC studies were analyzed for compatibility studies. The F4 formulation was considered as the optimized formulation as it shown maximum amount of release of drug was found to be 99.16% in 8 min. Gellan gum as a super disintegrant shown maximum drug release in the concentration of 10mg in F4 formulation.

KEYWORDS: Rizatriptan, Croscarmellose Sodium, Gellan Gum and Sodium Starch Glycolate.

1. INTRODUCTION

Sublingual administration of drugs shows the fast onset of action is carryout as compared to oral route. The retention time of sublingual medication is three to ten times greater than the oral route and is just passed by the hypodermic infusion method. Sublingual route has several advantages over the avoidance of first-pass metabolism, progressed patient compliance and ease of self-medication. This course has particular points of interest over the enteral and parenteral course of medication because of its high blood supply, the onset of action and improved bioavailability into the systemic circulation.[1] Various components like pH, molecular weight, and lipid solubility may exploit this technique. From these properties, a solvent medication may disperse too gradually through the mucosa to be dynamic. The sublingual glands are also considered as salivary glands which produce the mucin and helps in the fabrication of saliva, required for the breakdown of particles. These glands present in the lining of the oral cavity that is below the tongue. This also provides slippery that helps in chewing and swallowing the food. The amount of drug that reaches into the systemic circulation from the site of administration is directly proportional to membrane thickness. It is expressed in the following order Sublingual>buccal>gingival>palatal.[2]

Because of greater permeation and high blood supply, this release rapid onset of action and instant dosing regimen with less delivery period of drugs with the sublingual route. Sublingual means "under the tongue". It is considered to a method of placing drug via mouth so that the drug highly absorbed through blood vessels below the tongue more than digestive track. The sublingually administered drug pharmacologically activates in 1 – 2 minutes which is effectively impressed in this route. Some of the drugs which are administered through the sublingual route are Steroids, barbiturates, cardiovascular drugs, and enzymes. This administered drug directly reaches to nutritional benefits which avoid subject to gastric system and liver.[3]

1.1 Factors Affecting the Sublingual Absorption.[4,5]

1. Solubility in Salivary Secretion
2. Binding to Oral Mucosa
3. pH and pKa of The Saliva
4. Lipophilicity of Drug
5. Thickness of Oral Epithelium.

Rizatriptan is a selective 5-HT 1B/1D agonist receptors have week affinity towards 5-HT1A, 5-HT5A AND 5-HT7 receptors and there is no pharmacological activity for 5-HT2, 5-HT3 OR 5-HT4 receptor subtypes. It helps to relieve a headache, pain, and other migraine symptoms including nausea, vomiting, sensitivity to light/sound. The migraines can be easily treated to return your normal routine and decreases the pain medications.

CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.1251171

Available online at: http://www.iajps.com Research Article

FORMULATIONANDEVALUATIONOFVORICONAZOLE BUCCAL PATCHES BY USING SELECTED POLYMERS

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Abstract:

The aim of the present study is to formulate and evaluate Voriconazole Buccal Patches. Voriconazole is a triazole antifungal drug that is generally used to treat serious, invasive fungal infections. These are generally seen in patients who are immune compromised, and include invasive candidiasis, invasive aspergillosis, and certain emerging fungal infections. In the present study buccal drug delivery of Voriconazole was developed Matrix type of buccal patches was developed by using polymers such as Chitosan and Eudragit S 100. Buccal patches were prepared by employing solvent casting method. Propylene glycol and Tween80 were selected as both permeation enhancer and plasticizer. Drug excipient compatibility studies were carried out by using FTIR, and it was observed that there were no interactions between drug and polymers. Formulations were prepared by the varying concentrations polymers ranging from F1-F6, and all the formulations were evaluated for various physical parameters such as Physical appearance, Flatness, Weight variation, Thickness, Folding endurance, Drug content, Moisture uptake, Moisture content. All the results were found to be were found to be within the pharmacoepial limits, invitro drug release studies done by using dialysis membrane. Among all the 06 formulations F4 formulation which contain Eudragit S 100 100mg has shown 95.76% cumulative drug release within 12 hours. For F4 formulation release kinetics were plotted and the Regression coefficient value was found to be high for Korsemeyer Peppas model plot i.e., 0.999.

Key words: *Voriconazole, Buccal Patches, Chitosan and Eudragit S 100*

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QR code

*Please cite this article in press K.Chitra et al., **Formulationandevaluationofvoriconazole Buccal patches By Using Selected Polymers**, Indo Am. J. P. Sci, 2018; 05(05).*

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122

ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 12, Issue 2, 2019

Online - 2455-3891
Print - 0974-2441

Research Article

EVALUATION OF ANTIMICROBIAL AND ANALGESIC ACTIVITY OF *DIPLOCYCLOS PALMATUS* FRUITS ON ALBINO MICE

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Received: 07 July 2018, Revised and Accepted: 28 September 2018

ABSTRACT

Objective: The present study is preplanned to assess the antimicrobial and analgesic activity of the collected plants of *Diplocyclos palmatus* from Moinabad, Ranga Reddy, Telangana.

Methods: In this study, *D. palmatus* fruits were used to gain the ethanolic extract and were tested for the phytochemical screening, antimicrobial activity using agar diffusion method against Gram-negative bacteria (*Escherichia coli*) and Gram-positive (*Bacillus*) and to compare its effect with the marketed standard streptomycin, ciprofloxacin, and analgesic activity of plant was performed by tail clip, tails immersion, and radiant heat method.

Results: The maximum zone of inhibition is shown in the Gram-negative bacteria (*E. coli*) compared to standard and control. The ethanolic extract of *D. palmatus* fruits was shown analgesic activity and it was found to be more remarkable when compared to the standard aspirin and control. From the results of three different methods at different dose of ethanolic extract (100 mg/kg, 200 mg/kg, 400 mg/kg followed by 0–5 min interval up to 30 min), tail immersion method at 200 mg/kg dose of the *D. palmatus* fruits extract was achieved good results i.e., in 10 min (11.4 ± 1.93) and 15 min (13.4 ± 1.63). In tail clip method, 400 mg/kg dose is in 10 min (11 ± 1.67) and 15 min (10 ± 0.707) achieved best output, while same thing radiant heat method 200 mg/kg dose of the *D. palmatus* fruits extract is in 10 min (11.3 ± 1.67) and 15 min (14 ± 1.82) achieved outstanding results.

Conclusion: The analgesic and antimicrobial activity of ethanolic extract of *D. palmatus* fruits are more significant compared to the other part of *D. palmatus*. Hence, the study concludes that the plant is having both analgesic and antimicrobial activity, and therefore, it can be used for various therapeutic purposes and further analysis.

Keywords: Analgesic activity, Antimicrobial activity, *Diplocyclos palmatus*, Ethanolic extract, Streptomycin, Ciprofloxacin, Aspirin.

 DOI: http://dx.doi.org/10.22159/ajpcr.2019.v12i2.28346

INTRODUCTION

The medicinal plants are widely used by the traditional medicinal practitioners for curing various diseases in their day-to-day practice. In traditional system of medicine, different parts of *Diplocyclos palmatus* were used. It is a short-lived, perennial climbing plant producing annual, much-branched stems up to 6 m long from a fleshy rootstock [1]. The stems scramble over the ground, climbing into the surrounding vegetation where it attaches itself by means of tendrils. It is more commonly known as the lollipop climber or striped cucumber (E), Shivalingi (H) belonging to family Cucurbitaceae. The plant is recorded in India as growing and spreading in the wild. When ripe, it is red with longitudinal white stripes and reminds one of lollipop, hence, the common name. Lollipop climber is a perennial climber with hairless stem, becoming thickened and white dotted on the ridges when older. Leaves are broadly ovate, 3.5–14 cm × 4–14.5 cm, lobes are linear shaped to elliptic, hairless. Leaf stalk 1.5–9.0 cm long. Flowers are small, white or yellowish, male in stalkless clusters of 2–8, along with five female flowers in the same axial. Sepal cup is 3–4 mm long in male, 1.5–2.5 mm long in female, sepals smaller than tube. Flower of male larger than female. Fruit is solitary. It is ovoid round, 1.5–2.5 cm. When ripe, it is red with longitudinal white stripes and reminds one of lollipop, hence, the common name. It is found including the Himalayas, at altitudes of 200–1500 m. The small flowers of Lingini or Shivalingi are of greenish-yellow in color. The female flowers of the plant are borne in fascicles and the male ones are solitary. The plant's corolla is about 3–4 mm, with ovate-oblong, acute, pubescent lobes. The fruit or berry of the plant is rounded, with a diameter of 2–3 cm and the bluish-green. They ripe red and bear a few brown, obovate seeds. The compressed seeds have a length of 4 mm and width of 3 mm, and they are usually encircled by a prominent raised band. The plant is generally flowers between the months of August and September and fruits in September and October in central India [2].

Phytochemical studies of *D. palmatus* show the presence of alkaloids, flavonoids, triterpenoid saponins, steroids and proteins, and resins with sugars and starch. The seeds have been reported to contain 12% oil, protein, along with goniothalamin, bryonin, punicic acid, and lipids. Disease and illness are very much related and having similar concepts. The concepts are mainly, patients suffer from "illnesses" and physician diagnoses and treats "diseases." Disease can refer to a combination of signs and symptoms. It can also be referred as a phenomenon associated with a disorder of function or structure or illness associated with a specific cause [3].

D. palmatus traditionally reported as an antimicrobial properties and analgesic properties, scientifically seed and leaves of plant already reported as an antimicrobial and analgesic activity. In the present study, fruits of *D. palmatus* are studied for phytochemical screening, antimicrobial, and analgesic activity. Seeds are used in sterility due to blocked tubes in women, snake bite, root fever, stomach ache, and external abscess. Fruits are used in diarrhea; the Indian women sometimes take the seeds in combination with other plant drugs for helping conception and prevent miscarriage. The practitioners of ayurvedic medicine use the plant's fruit as an aphrodisiac and tonic, while in Siddha, the entire plant is used for getting relief from constipation. *In vitro* studies revealed that *D. palmatus* (aerial part) contain antioxidant and antimicrobial activity; seeds have analgesic,

International Journal of Advanced Pharmaceutical Sciences, Volume 1, Issue 08, Page 42-59
ISSN:2456-8147

Pharmacognostical Study and Evaluation of Antioxidant Activity of Leaves of *Ziziphus oenoplia* (L.) Mill.

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An open access journal

Supporting Information:

Received: 29 July 2018
Accepted: 01 July 2018
Published: 04 August 2018

Competing Interests:
The authors have declared that no competing interests exist.

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ABSTRACT

Herbal medicine is the oldest form of healthcare known to mankind. Herbs had been used by all cultures throughout history. It was an integral part of the development of modern civilization. Pharmacognostical parameters for easy identification like leaf constants, microscopy & physic chemical analyses are few of the basic protocol for standardization of herbals. Free radicals have been implicated in the etiology of several human diseases as well as ageing[20-21]. But it has to be emphasized that ROS and RNS are both produced in a well regulated manner to help maintain homeostasis at the cellular level in the normal healthy tissues and play an important role as signalling molecules. Plant phenols have not been completely studied because of the complexity of their chemical nature and the extended occurrence in plant materials. Attempts are also made to identify and evaluate antioxidants.

Keywords: : Herbal Medicine Ziziphus oenoplia (L.) Pharmacognostical Antioxidant Activity.