3.3	Research Publications and Awards
3.3.1	Number of research papers published per teacher in the Journals notified on UGC care list during the last five years

INDEX

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RESEARCH ARTICLE

UV Spectrophotometric Method Development and Validation of Lignocaine Hydrochloride in Bulk and Semisolid Dosage Form

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ABSTRACT:

Objective: A new, simple, sensitive, precise and reproducible UV spectroscopic method was developed for the estimation of Lignocaine Hydrochloride in bulk and Semisolid Formulation. **Methods:** The UV spectrum of Lignocaine Hydrochloride in RO water showed λ max at 228.8nm. Beer's law is valid in the concentration range of 20-100µg/ml. This method was validated for linearity, accuracy, precision, ruggedness and robustness. **Results:** The method has demonstrated excellent linearity over the range of 20-100µg/ml with regression equation y = 0.0097x + 0.023 and regression correlation coefficient r^2= 0.9992. Moreover, the method was found to be highly sensitive with LOD (3.55µg/ml) and LOQ (10.75µg/ml). **Conclusion:** Depending on results the given method can be successfully applied for assay of Lignocaine Hydrochloride in Semisolid formulation.

KEYWORDS: Lignocaine Hydrochloride, UV spectroscopy, method development and validation, RO Water, Semisolid Formulation.

INTRODUCTION:

Lignocaine Hydrocholride is a used for the treatment of local anesthetic and cardiac depressant used as an antiarrhythmia agent. It exhibits class IB antiarrhythmic effects. The agent decreases the flow of sodium ions into myocardial tissue, especially on the Purkinje network, during phase 0 of the action potential, thereby decreasing depolarization, automaticity and excitability.

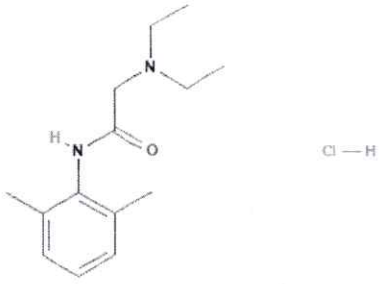

Figure 1: Structure of Lignocaine Hydrochloride

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The Chemical name of Lignocaine Hydrochloride is (2-(diethylamino)-*N*-(2,6-dimethylphenyl) acetamide; hydrochloride) The molecular formula of Lignocaine Hydrochloride is $C_{14}H_{23}ClN_2O$ and molecular weight is 270.8gm/mol. It is freely soluble in water, ethanol and methanol. The aim of this study is to give a new, simple, sensitive, precise and reproducible UV spectroscopic method was developed for the estimation of Lignocaine Hydrochloride in bulk and Semisolid formulation[1-3].

MATERIALS AND METHOD:

Materials:

Lignocaine Hydrochloride was take as gift sample from Adhar life Sciences, Solapur. RO water was taken from local market.

Instruments:

Analytical balance (Shimadzu AY220), Sonicator (Microclean-1103), UV-Visible spectrophotometer (Systronic 2201).

Experimental:

Preparation of standard stock solution:

Accurately weighed 10mg of Lignocaine Hydrochloride transferred to 100ml volumetric flask. It was dissolved in RO water and sonicated for 5 minutes. The volume was made up to mark with same diluent to make up final strength.

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(http://www.derpharmachemica.com/archive.html)

Development and Validation of a Simple and Rapid UV Spectrophotometeric Method for Linagliptin in Bulk and Marketed Dosage Form

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ABSTRACT

A simple, rapid, accurate and precise UV spectrophotometric Method for Linagliptin in Bulk and marketed tablet dosage form has been developed. The λmax of Linagliptin was found to be 295 nm. The method was linear in the range of 2-10 µg/ml presenting a good correlation coefficient (R2 = 0.9991). Method is validated as per ICH guideline and statistically significant as all the statistical parameters are within the acceptance range (%RSD < 2.0 and SD < 2. 0) for both Accuracy and precision.

Keywords: Linagliptin; UV - method; Development; Validation; Spectrometric method

INTRODUCTION

Linagliptin is a dipeptidyl peptidase4, also DPP-4 inhibitor developed by Boehringer Ingelheim for the treatment of type II diabetes. Linagliptin differs from other DPP-4 inhibitors in that it has a non-linear pharmacokinetic profile, is not primarily eliminated by the renal system, and obeys concentration dependent protein binding. Linagliptin was approved by the FDA on May 2, 2011[1].

Linagliptin is described chemically as 1H-purine-2, 6-dione, 8-[(3R)-3-amino-1-piperidinyl]-7-(2-butyl-1-yl)-3, 7-dihydro-3-methyl-1[(4-methyl-2-quinazolinyl) methyl]. The empirical formula is $C_{25}H_{28}N_8O_2$ and the molecular weight is 472.5. The structural formula is shown in figure 1. Linagliptin is a white to yellowish substance. It is very slightly soluble in water. Linagliptin is soluble in methanol, sparingly soluble in ethanol, very slightly in isopropanol and very slightly soluble in acetone [2].

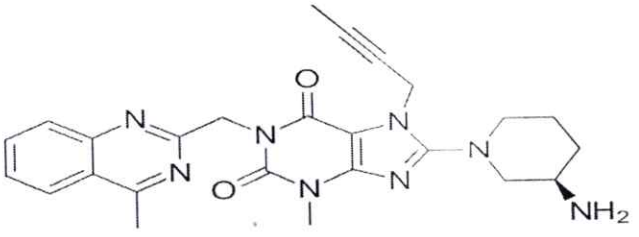

Figure 1: Chemical structure of Linagliptin

MATERIALS AND METHOD

Materials

Linagliptin was obtained as a gift sample from Micro Labs Ltd. Bangalore, INDIA. Tablets of Ondero were purchased from local market; each

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RESEARCH ARTICLE

UV Spectrophotometric Method Development and Validation of Darunavir in bulk and Solid Dosage Form

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ABSTRACT:

Objective: A new, simple, sensitive, precise, reproducible UV visible spectrophotometric method was developed for the determination of Darunavir in Tablet dosage form with 0.1N HCl. **Method:** The method is based on the formation of a colorless complex. The UV spectrum of Darunavir in 0.1N HCl showed maximum wavelength at 298nm. Beer's law is valid in the concentration range of 10-60µg/ml. this method was validated for linearity, accuracy, precision, assay, ruggedness and robustness. **Results:** The method has demonstrated excellent linearity over the range of 10-60µg/ml with the regression equation y=0.0113x+0.0098, and regression coefficient i.e. r^2=0.9992 moreover, the method was found to be highly sensitive with LOD (1.85µg/ml) and LOQ (5.62µg/ml). **Conclusion:** Based on the results the proposed method can be successfully applied for the assay of Darunavir in various tablet dosage forms.

KEYWORDS: Darunavir, UV visible spectrophotometer, 0.1N HCl, method development and validation.

INTRODUCTION:

Darunavir is a protease inhibitor used with other HIV protease inhibitor drugs as well as ritonavir for the effective management of HIV-1 infection. As a second-generation protease inhibitor, darunavir is designed to combat resistance to standard HIV therapy. It was initially approved by the FDA in 2006. Darunavir is being studied as a possible treatment for SARS-CoV-2, the coronavirus responsible for COVID-19, due to in vitro evidence supporting its ability to combat this infection. Clinical trials are underway and are expected to conclude in August 2020.[1-2]

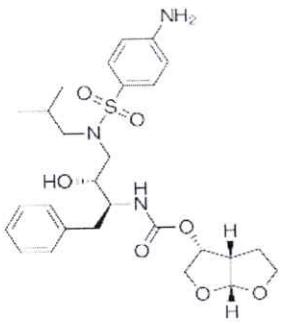

Figure1: Structure of Darunavir

The IUPAC name of Darunavir is (3R,3aS,6aR)-hexahydrofuro [2,3-b] furan-3-yl N-[(2S,3R)-3-hydroxy-4-[N-(2-methylpropyl)4-aminobenzenesulfonamido]-1-phenylbutan-2-yl]carbamate and chemical formula is $C_{27}H_{37}N_3O_7S$. The molecular weight of Darunavir is 547.23gm/mol. Darunavir is Soluble in pH 7.4, ethanol, methanol, DMSO, DMF, 0.1N HCl.[3]

MATERIALS AND METHODS:

Instruments Used:

UV-visible Spectrophotometry (Systronic 2201), 1cm quartz cuvette were used for the measurement of absorbance, Weighing Balance (Shimadzu AY220), Sonicator (Oscar Ultrasonicator microclean-103).

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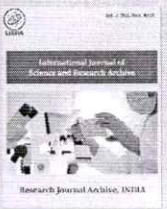

(REVIEW ARTICLE)

Check for updates

A review on vegetable oil based biodegradable polymers

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Abstract

The reviewed work addressed the shift in focus from conventional polymers to bio-based and renewable polymers. This extensively discussed the values of various fatty acid components present in the oils and polymers. Areas of application of the thermosetting polymers obtained from plant seed oils were discussed. Non-biodegradable polymers are causing severe damage to the environment. To counter this, need of biodegradable polymers is gaining a rapid growth in numbers, in their applications and quantities used. In this manuscript, we have briefly described important vegetable oil derived materials such as alkyds, poly-esteramides, , polyurethanes, epoxies, polyols, along with their preparation and applications as protective coatings. A small portion of the review is also dedicated to the future perspectives in the field. In spite of their extensive utilization in the world of coatings, literature survey revealed that in the past no review has come up describing the chemistry and applications of vegetable oil polymer based coating materials.

In addition, due to the oil crises worldwide, focuses from synthesizing polymers from petroleum has shifted to the synthesis of polymers from renewable resources such as vegetable oils. The use of vegetable oils in the polymer renders biodegradability to the polymer. Different researchers have used different vegetables oils like castor oil, soybean oil, & sunflower oil for synthesis of polymers and utilized them in diverse fields like biomedical, coatings, adhesives, and as structural materials. This review discusses the synthesis, characterization, degradation and applications of polymers obtained from natural oils such as castor oil, soybean oil etc.

Keywords: Vegetable oil; Fatty acid; Biodegradable polymer; Polymer application

1. Introduction

Polymers are used for varied technical functions, reckoning on their diversifying properties. Massive range of useful variations and behaviors has made them helpful in an exceedingly large kind of applications.

The monomer and architectural organization of the macromolecules at the same time decide the dominating properties of the polymers. The endless numbers of choices for making or modify polymers have created these materials enticing to researchers

Among bio-based resources, triglyceride based vegetable oils ar vital for polymer synthesis. Vegetable and modified oils are used as main raw materials for resin preparation. Linseed and tung oil are used for coating ingredients in oil paints and varnishes.

These oils are heated thermally to prepare paint ingredients through a reaction known as a Diels–Alder reaction. Sometimes, modifications of nondrying oils by drying oils are found to be fruitful within the preparation of polymers.

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(5)

Development and Validation of RP-HPLC Method for the Estimation of Dolutegravir in Bulk and Pharmaceutical Dosage Form

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ABSTRACT

A rapid, selective, precise and accurate Reverse Phase High Performance Liquid Chromatographic method has been developed and validated for the estimation of Dolutegravir in bulk and tablet formulation. The chromatographic separation was achieved by using Zorbas SB-Aq (250x4.6 mm,5µ) with the mobile phase comprising of 0.1% Perchloric Acid : ACN in the ratio of 60 : 40 v/v. The flow rate was 1ml/min and the separated Dolutegravir was detected by Diode array detector (DAD) at 259 nm. The retention time of Dolutegravir was found to be 3.8 minutes. The column temperature was 30±0.8°C with injection volume of 10µl. The linearity data showed good linear relationship within the concentration range of 30-70 µg/ml and the regression coefficient was found to be r2= 0.9998. The method obeyed ICH guidelines. The method was successfully validated in accordance to the ICH guidelines for accuracy, precision, specificity, linearity, system suitability, LOD & LOQ. The proposed method was found to be sensitive, accurate, precise, economic, reproducible and consistent.

Keywords: Dolutegravir, RP-HPLC, validation, method development.

INTRODUCTION

Dolutegravir is chemically designated as Isopropyl (4R,12aS)-N-(2,4-difluorobenzyl)-7-hydroxy-4-methyl6,8-dioxo-3,4,6,8,12,12a-hexahydro-2H-pyrido[1',2':4,5] pyrazino[2,1-b][1,3] oxazine-9-carboxamide. Its molecular formula is C20H19F2N3O5, and its molecular weight is 441.37 g/mol

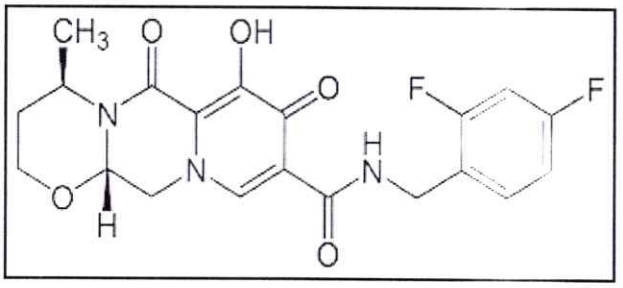

Fig.1. Structure of Dolutegravir[1].

Dolutegravir is a HIV-1 integrase inhibitor that blocks the strand transfer step of the integration of the viral genome into the host cell (INSTI). Dolutegravir belongs to a group of HIV drugs called 'integrase' inhibitors. Integrase inhibitors block HIV enzyme called integrase. By blocking integrase, it prevent HIV from multiplying and can reduce the amount of HIV in the body .The effect of this drug has no homology in human host cells which gives it an excellent tolerability and minimal toxicity. Dolutegravir was developed by ViiV Healthcare and FDA approved it on August 12, 2013. Dolutegravir is indicated in combination with other antiretroviral agents for the treatment of patients with HIV-1 infection that comply with the characteristics of being adults or children aged 12 years and older and present at least a weight of 40 kg [2]. DTG is a

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UV Spectrophotometric Method Development and Validation of Bilastine in Bulk and Tablet Formulations

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ABSTRACT

Objective: A new, simple, sensitive, precise and reproducible UV spectroscopic method was developed for Bilastinein Tablet Formulation.

Methods: The UV spectrum of Bilasine in Methanol 0.1%: TFAwater(80:20) showed λ max at 277 nm. Beer's law is valid in the concentration range of 8-40 µg/ml. This method was validated for linearity, accuracy, precision, LOD and LOQ.

Results: The method has demonstrated excellent linearity over the range of 8-40µg/ml. with regression equation y = 0.0198x + 0.0814 and regression correlation coefficient r^2= 0.999. Moreover, the method was found to be highly sensitive with LOD (1.57µg/ml) and LOQ (4.77µg/ml).

Conclusion: Depending on results the given method can be successfully applied for assay of Bilastine in Tablet formulation.

Keyword: Bilastine, UV spectroscopy, method development and validation, Methanol TFA: Water, Tablet Formulation.

INTRODUCTION

Bilastine or 2-[4-[2-[4-[1-(2-ethoxyethyl) benzimidazol-2-yl] piperidin-1-yl] ethyl] phenyl]-2-methylpropionic acid, is aselective Histamine H1 receptor antagonist, leading to decreased nasal congestion& urticaria. It reduces the development of allergic symptoms by binding to & preventing activation of the H1 receptor. It is used for management of seasonal rhinitis &spontaneous urticaria.

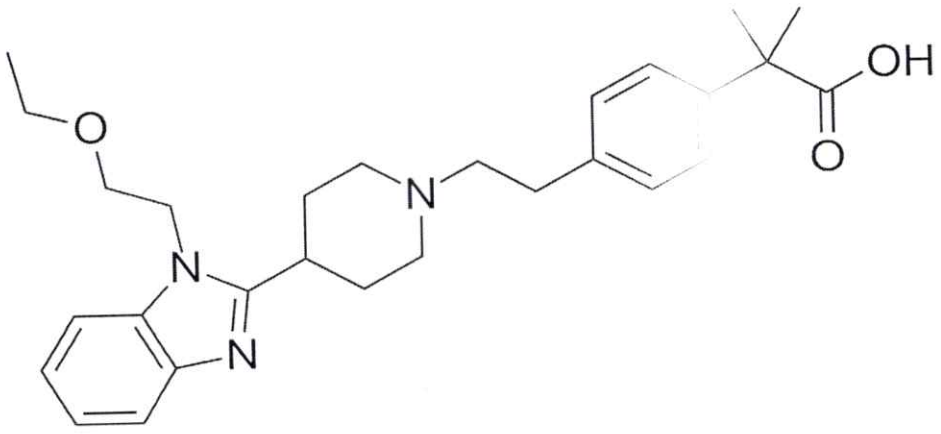

Figure 1: Structure of BILASTINE

The molecular formulaof bilastine is $C_{28}H_{37}N_3O_3$, and molecular weight is 469.6 gm /mol. It is sparingly soluble in Methanol, Chloroform and Soluble in Methylene chloride. The aim of this study is to give a new, simple,sensitive,precise and reproducible UV spectroscopic method was developed for Bilastine in Tablet formulation.

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RESEARCH ARTICLE

UV Spectrophotometric Method Development and Validation of Luliconazole in Bulk and Formulation

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ABSTRACT:

Objective: A new, simple, economical, sensitive, precise and reproducible UV visible spectrophotometric method was developed for the estimation of luliconazole in pure form and pharmaceutical formulation as per ICH guidelines. **Method:** A UV spectrophotometric method has been developed using methanol and water as solvent to determine the luliconazole in bulk and pharmaceutical dosage formulation. The λmax of luliconazole in methanol and water was found to be 297nm. **Results:** The drug was proved linear in the range of 3-15µg/ml and exhibited good correlation coefficient (R^2= 0.9993) and excellent mean recovery (98-99%). The % RSD for intra-day and inter-day precision was found to be 1.051288 and 1.138658 respectively. The LOD and LOQ of Luliconazole was found to be 1.1168µg/ml and 3.3845µg/ml respectively. This method was successfully applied to luliconazole content in marketed brands and results were in good agreement with the label claims. **Conclusion:** The method was validated for linearity, precision, repeatability and reproducibility. The obtained results proved that the method can be employed for the routine analysis of luliconazole in bulks as well as in commercial formulations.

KEYWORDS: Luliconazole, UV-Spectrophotometric method, Method Development and validation, methanol and water.

INTRODUCTION:

Luliconazole ($C_{14}H_9Cl_2N_3S_2$), chemically named as 2-[(2E,4R)-4-(2,4-dichlorophenyl)-1,3-dithiolan-2-ylidene]-2-(1H-imidazol-1-yl) acetonitrile),[1] is a broad-spectrum imidazole that is active against various fungi including Tinea, Candida, Aspergillus, Trichophyton andEpidermophyton. It has amolecular weight of 354.28 and melting point in the range 121-125°C[2].

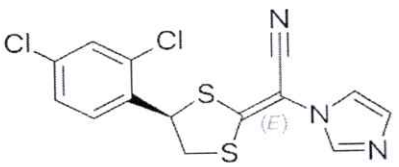

Figure 1: Structure of luliconazole

Luliconazole is used for the treatment of interdigital tinea pedis, tinea cruris, and tinea corporis. The mechanism of action for luliconazole's anti-fungal activity is still not known, but luliconazole is thought to prevent the enzyme lanosteroldemethylase[3]. Lanosterol demethylase is needed for the synthesis of ergosterol, which is a major part of the fungus cell membranes. Luliconazole, an imidazole antifungal activity available as a 1% topical cream, is indicated for the treatment of athlete's foot, jock itch, and ringworm caused by dermatophytes such as Trichophyton rubrum, Microspore gypsum and Epidermophyton floccosum[4].

MATERIALS AND METHODS[5]:

Materials:

Instrument used:

A double beam UV -visible spectrophotometer (Shimadzu, model 1800) was used for recording of spectra and measuring absorbance. An electronic analytical balance (Shimadzu, AY 220) were used in this study.

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DEVELOPMENT OF DUAL MATRIX BASED COLON TARGETED DELAYED RELEASE BUDESONIDE TABLETS FOR THE TREATMENT OF INFLAMMATORY BOWEL DISEASES

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ABSTRACT

Current work was aimed to develop and assess colon-targeted delayed release dual matrix formulations and microcapsules of anti-inflammatory drugs Budesonide and Mesalamine as a novel avenue for the treatment of inflammatory bowel diseases. Eight different dual matrix core tablet formulations (B1-B8) containing 9 mg of Budesonide were prepared using different concentration of Eudragit® L100, PolyoxTM WSR303 and Carbopol® 971 based on factorial design with three factors and two levels (23). Coating the prepared matrix core was done with a 10% w/w Eudragit® L30D solution. The developed formulations were tested for product attributes like weight variation, thickness/ hardness, percent friability, content-uniformity, swelling index, mucoadhesion strength, and in-vitro drug dissolution in dissolution media simulating gastrointestinal conditions. Studies of the stability and in-vitro release kinetics of the tablets were also conducted.

IR spectral analysis shows that a drug and polymer physical mixture was safe and did not react chemically with one another. All Budesonide tablet formulations (B1–B8) with a dual matrix had pre-compression values that were within the allowed range. Tablet thickness, weight fluctuation, friability, and content uniformity were all within acceptable ranges after compression, as defined by the Pharmacopeia. Formulation B5 (100 mg of Eudragit® L100 and 120 mg of PolyoxTM WSR303 was shown to have the highest tablet swelling index and mucoadhesive strength. Stability experiments confirmed that formulation B5 was stable and that it provided the best in-vitro drug release.

Keywords: Dual matrix tablets; Targeted drug delivery system; Inflammatory bowel disease; Roentgenographic study

INTRODUCTION

Oral dosage forms are the most popular choice for patients because of their versatility, accessibility of consumption, high patient compliance, and lack of sterility restrictions.1,2 When a drug is administered orally, it gets absorbed into the body after dissolving in stomach or intestinal fluid. When drugs need to be administered locally in the colon, or when they need to be shielded from the stomach and duodenum, the limitations of the typical oral dose form become apparent.3

Management of colon diseases like ulcerative colitis, Crohn's disease and irritable bowel syndrome often relies on oral delivery of drugs directly to the colon, as this provides high local

ENGINEERED ATENOLOL-GLYCOCONJUGATES TO TARGET H9C2 CARDIOMYOCYTE CELL LINES

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Abstract
Background: One of the most important fields of biomedical engineering study nowadays is targeted drug delivery to specific cells. A drug's therapeutic efficacy can be improved and optimised by tightly targeting it to a pathophysiologically essential tissue architecture. The goal of this research is to develop saccharide conjugates for the targeted delivery of Atenolol, a -blocker.
Methods: Galactose (monosaccharide), pectin (polysaccharide), and chitosan were chosen as the saccharides (polysaccharide). By grafting Atenolol with the modified saccharides, the conjugates were created. Spectroscopic and thermal studies were used to describe the chemically changed saccharides conjugates. H9c2 cell lines were used to conduct drug release research and cellular uptake studies. To investigate cytotoxicity, a brine shrimp lethality test was done.
Results: The outcomes exhibit that Atenolol-modified saccharide conjugates can productively convey the medication to the target.
Conclusion: It can be inferred that the improvement of saccharide-drug conjugates can be a compelling methodology for targeting cardiovascular medication.

Keywords
glycoconjugates; atenolol; targeting

Introduction

The capacity to target a medicine to specific cells can boost its therapeutic efficacy dramatically. Adequate drug dosages delivered to specific areas increase therapeutic outcomes wherever they are needed and hence reduce side effects, potentially resulting in a large reduction in side effects [1–3]. The drug targeting concept, according to Martinez, is frequently related with the utilisation of carrier systems, which can possibly deliver medicines, imaging agents, or therapeutic genes selectively to the site of action.

Natural-source oligosaccharide and polysaccharide polymers are non-toxic, biocompatible, and biodegradable. Other biopolymers, such as lipids and proteins, are less thermally stable than polysaccharides [4,5]. According to Sabyasachi [6] integrating the therapeutic agent within a chemically modified polymeric matrix may help to protect the physiologically active component from degradation, improve absorption, control drug release, improve therapeutic efficacy, and reduce administration frequency. Chemical grafting is a method of connecting one or more species of blocks to the main chain as a side chain, resulting in macromolecular copolymers with different

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Synthesis and characterization of chitosan nanoparticles decorated with folate and loaded with dasatinib for targeting folate receptors in cancer cells

Smita Tukaram Kumbhar [a,#,*], Ravikant Yashwantrao Patil [a], Manish Sudesh Bhatia [b], Prafulla Balkrushna Choudhari [b], Vinod Limbraj Gaikwad [c]

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ARTICLE INFO

Keywords:
Folate-chitosan
Targeted delivery
Dasatinib
MCF-7

ABSTRACT

Background: This study produced these Folate-Chitosan (FA-CS) conjugates by coupling a reaction with FA with CS, which resulted in better performance previously attained due to the preservation of CS's basic chemical properties as well integration of the folate targeting receptor.

Methods: The FA-CS conjugates were synthesised using triphosphate (TPP), which is based on the chemical conjugation of the amino group of CS with the carboxylic group of FA and was validated using FTIR and 1H NMR spectroscopy, respectively.

Results: The FA-CS-NPs were shown to exhibit a unique core-shell structure under transmission electron microscopy; the encapsulation efficiency EE (percentage) and loading efficiency LE (percentage) of Dasatinib in FA-CS-DS-NPs were 50.7 ± and 12.8 ± 0.21%, respectively. The FA-CS-DS-NPs exhibited a homogenous particle dis f 103.17 ± 5.20 nm (PDI 0.081, zeta potential 20.2 ± 5.9 mV). As the pH of the dissolv on lowers, the rate of DS release from the NPs increases, indicating that DS release from -NPs may be higher in a low pH environment than in a high pH environment. The M was used to examine the cell viability profile, which indicated that FA-CS-NPs did not e significant cytotoxicity. In the cellular uptake study, for example, the intracellular con tion of DS in MCF-7 cells after exposure to FA-CS-DS-NPs was considerably higher than the concentration of DS in cells exposed to DS alone.

Conclusion: As a result, FA-CS-DS-NPs show promise ancer therapeutic drug delivery mechanism.

1. INTRODUCTION

Around the world, cancer is the leading cause of morbidity and mortality. According to studies dia saw roughly 11,57, 294 new cases of adverse development in 2018 [1]. Anticancer medications are administered to the body non-specific manner, causing

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Development and characterization of posaconazole loaded in situ gel formulation for ophthalmic application

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Abstract

The objective of this research was to formulate and evaluate the latent use of the *in situ* gel preparations for ocular delivery of posaconazole for the treatment of fungal keratitis. An in situ gelling system was used to rise the residence time and thus the bioavailability of posaconazole in ocular mucosa. In situ gel preparations were formulated by cold method using polymers like poloxamer 407, poloxamer 188 and sodium alginate. Finally, concentration of posaconazole in formulations was 0.2% (w/w). These formulations were evaluated for pH, solution-gel transition temperature, gelling capacity, drug content, viscosity and clarity. Gelation temperature of each and every one of the preparations was within the range of 32-34°c. All the preparations exhibited fairly constant drug content. Also in-vitro drug release and anti-fungal action of these preparations were also estimated. Drug release study of all the preparations exhibited sustained release properties. In conclusion, posaconazole loaded in-situ gels could be presented as a promising approach for optical drug delivery for the behavior of fungal diseases.

Keywords: Ocular delivery, in situ gel, posaconazole, microbiology study

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DEVELOPMENT AND VALIDATION OF STABILITY INDICATING RP-HPLC METHOD FOR THE ESTIMATION OF BREXPIPRAZOLE IN BULK AND TABLET

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ABSTRACT
The purpose of this analysis study is to develop a novel, simple, accurate, precise, specific and economical method for RP-HPLC to determination of the connected substances in tablet and bulk form of brexpiprazole. Agilent zorbax bonus-RPC18 (250× 4.6 mm, 5µ) column using for chromatographic separation. Sodium dihydrogen phosphate having 2.5pH adjusted with 85% O-phosphoric acid it is buffer solution. Mobile part is buffer: acetonitrile (62.5:37.5 v/v) at a flow rate 1.0 ml/min. The linearity range of concentration 25-75µg/ml. 3.12min is retention time and ultraviolet detector at 215nm with 10µL injection volume. Brexpiprazole valid as per guidelines of ICH with respect of specificity, accuracy, linearity and precision. Brexpiprazole subjected with stress conditions of forced degradation (acid, oxidation, base, dry heat and UV).

Keywords: Brexpiprazole, RP-HPLC, Validation, Method development, 215nm and forced degradation.

1.0 INTRODUCTION
Chemical name of Brexpiprazole is 7-{4-[4-(1benzothiophen-4-yl)piperazine-1-yl]butoxy}-1,2-dihydroquinoline-2-one.[1-4]USFDA approved Brexpiprazole drug for treatment of schizophrenia in 13 July, 2015.[2,5]$C_{25}H_{27}N_3O_2S$ is molecular formula[6] and 433.57g/mol with mass.[7] Brexpiprazole soluble in methyl alcohol and insoluble in water.[8]

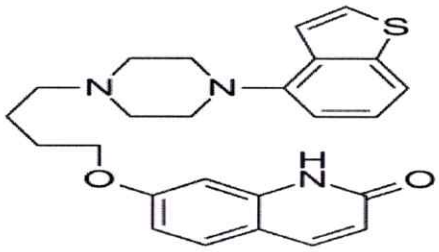

Figure 1: Structure of Brexpiprazole

Literature survey informs that brexpiprazole is creating out by UV- visible spectroscopy[7,9] and HPLC[6,8,10].Alzheimer's disease, treatment of emotional disorder, post traumatic stress, Attention-Deficit/ hyper-activity disorder. on it brexpiprazole is used for

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Development and Validation of Stability Indicating RP-HPLC Method for the Estimation of Dasatinib from Bulk and Tablet

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ABSTRACT:

A simple, accurate, precise, rapid and specific reverse phase HPLC method has been developed for the estimation of dasatinib in bulk and pharmaceutical dosage forms. The chromatographic separation was achieved on Phenomenox Kinetex XB-C18(150×4.6mm, 5µ) column. The mobile phase consisted of 0.1% trifluroacetic acid water: acetonitrile in (70:30v/v) at a flow rate 1.0ml/min. The analyte was monitored using UV at 324nm and run time was kept 10min. The column temperature was adjusted at 30°C with injection volume 10µl. The retention time of dasatinib was 3.31min. Linearity was found to be in concentration range of 42-98µg/ml. Dasatinib was subjected to completely different stress conditions like acid, base, dry heat, hydrogen peroxide and UV checked for its suitability, specificity, stability and degradation. Results of study were valid statistically and by recovery studies. The method was validated according to the ICH guidelines with relevancy to accuracy, precision, specificity and linearity.

Keywords: Dasatinib, RP-HPLC, Method development, 324nm, Validation, Forced degradation

1.0 INTRODUCTION:

Dasatinib is categorized as an anticancer agent for treating such type of cancer like chronic myeloid leukemia and acute lymphoid leukemia. It is an oral medication.[1] Dasatinib is chemically designated as N-(2-Chloro-6 methylphenyl)-2-({6-[4-(2-hydroxyethyl)piperazin-1-yl]-2-methylpyrimidin-4-yl}amino)-1,3-thiazole-5 carboxamide.[2] Its molecular formula is $C_{22}H_{26}ClN_7O_2S.H_2O$ and its molecular weight is 488g/mol.[2]

Figure 1: Structure of Dasatinib

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ORIGINAL ARTICLE

Synthesis, Characterization, In Silico Analysis, and Pharmacological Evaluation of Metoprolol-Modified Saccharide Conjugates for Cardiovascular Targeting

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Accepted: 17 July 2021

Abstract
Targeted drug delivery to selective cell has emerged as one of the most significant areas of biomedical engineering research today, so to optimize the therapeutic efficacy of a drug by localizing strictly its pharmacological action to a pathophysiologically relevant tissue system. The current study is aimed to develop saccharide conjugates for targeted delivery of metoprolol, the cardio-selective β-blocker. The examination was done in two significant steps. The initial step includes synthesis of modified saccharides (MS). These MS were used for synthesis of metoprolol-modified saccharide conjugates (MET-MS). The chemical modification of saccharides was evaluated for its swellability and HLB followed by FTIR and DSC. The affirmation of conjugate synthesis was finished by melting point and TLC as primary parameters followed by HR-MS, FTIR, DSC, and [1] H NMR study. Drug release analysis and cellular uptake study examination were completed utilizing H9c2 cell lines. Brine shrimp lethality bioassay was done to research the cytotoxicity of synthesized conjugates. The rate lethality and LC_{50} values were dictated by contrasting the mean enduring hatchlings of the test and control tubes. In silico examination was performed to evaluate the possible binding of the developed conjugates with the GLUT-4. Homology model of the GLUT-4 was created utilizing SWISS MODEL server.

Keywords Glycoconjugates · Chemical modification · Targeting

Introduction

The ability to specifically target a drug to cardiac cells has the potential to significantly improve their therapeutic efficacy. After delivering adequate doses of the therapeutically active agent to specific sites promotes a pharmacological action wherever required and thus limits its side effects elsewhere, which potentially results in a significant decrease of side effects. Targeted delivery has the potential to revolutionize current treatments and improve the clinical outcome for patients [1, 2].

The drug targeting concept is often associated with the use of carrier systems, which are potentially able to transport drugs, imaging agents, or therapeutic genes selectively to the site of action [3]. Targeted delivery of therapeutically active agents to cardiac tissues can be achieved by passive or active targeting [4–6].

Oligosaccharide and polysaccharide polymers obtained from natural origins are non-toxic, biocompatible, and biodegradable [7, 8]. Incorporation of the therapeutic agent into a chemically modified polymeric matrix might protect the biologically active compound from degradation, improve absorption, control drug release, enhance the therapeutic efficacy, and so leads to the decrease in the frequency of administration [9].

The monosaccharide Galactose is an aldohexose that naturally occurs in D-form in lactose and also C4 epimer of glucose [10–12].

The polysaccharide Pectins are made of several sugar derivatives; the most important of which are the homogalacturonan and rhamnogalacturonan regions and they often

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Development and Validation of Rp-Hplc Method for the Estimation of Clenbuterol Hydrochloride in Bulk And Tablet

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ABSTRACT

The purpose of this analysis study is to develop a novel, simple, accurate, precise, specific and economical method for RP-HPLC to determination of the connected substances in tablet and bulk form of clenbuterol hydrochloride. Agilent zorbax bonus-RP C18 (250× 4.6 mm, 5µ) column using for chromatographic separation. Mobile part is 0.1% TFA water : acetonitrile (60:40v/v) at a flow rate 1 ml/min. The linearity range of concentration 25-75µg/ml. 3.87 min is retention time and ultraviolet detector at 245nm with 10µL injection volume. With 8 min run time. Clenbuterol hydrochloride valid as per guidelines of ICH with respect of specificity, accuracy, linearity and precision.

Keywords: Clenbuterol hydrochloride, RP-HPLC, Method development, 245 nm.

INTRODUCTION

Clenbuterol hydrochloride chemically known as 1-[4-amiono-3, 5-dichlorophenyl] -2[tert-butyl amino] ethan-1-ol hydrochloride[1,2] $C_{12}H_{19}Cl_3NO_2$ with molecular formula.[1] clenbuterol is used in human and veterinary medicine of its broncholytic and tocolytic action.[3]

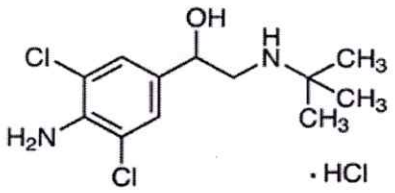

Figure 1: Structure of clenbuterol hydrochloride

β-agonist act by impending the uptake of adrenal hormones by stimulation of the cardiovascular system and nerve cells. They produce redistribution of fat in tissue of muscle when treatment is extended.[4] Clenbuterol is using as a solid implantation to develop growth and better productivity.[5,6] Clenbuterol is a synthetic agonist of β-adrenergic and in swine adipocytes has adrenergic receptor with high affinity.[7,8] For the determination there have various methods for determination clenbuterol hydrochloride and chloride including high performance liquid chromatography.(HPLC), gas chromatography-mass spectrometry (GC-MS), capillary electrophoresis mass spectrometer (CE-MS),capillary electrophoresis (CE).[9-11]

Chemicals and reagents

The drug clenbuterol hydrochloride was obtained as gift sample from Aadhar Life Sciences. HPLC grade sodium dihydrogen phosphate, Acetonitrile, O-phosphoric acid, hydrogen peroxide, water (Merck) Mumbai, India. Sodium hydroxide and hydrogen chloride from Thomas baker ,0.45 µm Millipore syringe filters (Ultipor®N_{66}®Nylon 6, 6 Membrane) were from Pall Life Sciences, India.

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Method Development and Validation of Imatinib in Bulk and Pharmaceutical Dosage Form by RP-HPLC

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ABSTRACT

A simple, novel, economic and accurate reverse phase high performance liquid chromatographic method has been developed for the quantification of Imatinib in bulk and capsule dosage form. Separation was achieved on Zorbax Bonus RP C18 (250×4.6mm, 5µ) column as the stationary phase. The column temperature was 30°C and injection volume was 10µL. The mobile phase consists of 0.1% trifluroacetic acid water :acetonitrile in the ratio 82:12 v/v. The runtime was 8 min. and analyte can be detected at 265nm. The flow rate was maintained at 1ml/min and retention time was found to be 4.04 min. The method was linear in the concentration range of 60-140µg/ml. As per ICH guidelines method was validated and this developed method is specific, accurate, precise, rapid, cost effective and reproducible foe estimation of Imatinib for quality control level.

Keywords: Method development, validation, diode array detector, 265nm, Imatinib.

Introduction:

The chemical name of Imatinib is N-(4-methyl-3-{(4-pyridin-3yl)pyrimidin-2-yl)amino}phenyl)-4-((4-methylpiperazin-1-yl)methyl)benzamide.[1] Imatinib has molecular formula is $C_{29}H_{31}N_7O$ and its molecular weight is 493.6g/mol.[2] The Pka value of Imatinib has 7.8.[3]

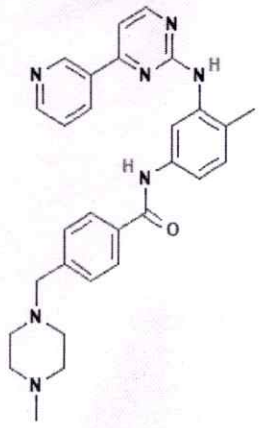

Figure 1: Structure of Imatinib

It is an oral medication used for treating Philadelphia chromosome positive chronic myeloid leukaemia[3] and gastrointestinal tumors[4]. Imatinib is soluble in methanol, 0.1N HCl, distilled water and slightly soluble in dimethyl ether.[4] Imatinib is a protein tyrosine kinase inhibitor, it inhibits proliferation and induces apoptosis in Bcr-Abl positive cell lines. Imatinib also inhibits receptor tyrosine kinases for platelet derived growth factor.[5] Imatinib has bioavailability is 98% when ingested orally.[6] Literature survey revealed that, Imatinib was determined by analytical methods such as RP-HPLC[1-8] , UPLC[9], LC-MS[10-11], UV[12] HPLC-UV[13]and HPTLC[14]. The aim of present work was to develop and validate

Ph Sensitive In-Situ Gelling Gastro-Retentive Drug Delivery System Of Esomeprazole For Management Of Peptic Ulcer Disease

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DOI: 10.47750/pnr.2022.13.S10.278

Abstract

Esomeprazole, a proton pump inhibitor recommended for the treatment of gastroesophageal reflux disease-related erosive esophagitis, is one of the frequently prescribed drugs for the treatment of peptic ulcer diseases. Owing to the poor oral bioavailability and half life of less than 2 hrs, the current work was aimed to formulate an in situ floating system for the delivery of Esomeprazole in a sustained manner using Xanthan Gum, Gelrite along with Calcium carbonate and citric acid with 3^2 factorial design. Xanthan gum, Gelrite and calcium carbonate were selected as independent variables. The prepared formulations were evaluated for viscosity, clarity, gelling strength, floating time, drug release and in-vivo gelation and floating study. All the batches have shown pH around 8 and good gelling capacity except E_1, E_2 and E_3. Viscosity and drug content of Raft formulation varied from 1343.33 to 7034.66 CP, 96.24 to 101.52 % respectively. The viscosity is positively influenced by concentration of Xanthan gum and Gelrite. Floating time differed from 5 seconds to 5 minutes where all formulations showed total floating time more than 12 hours except E_1, E_2 and E_3. In-situ gelation was observed at acidic pH with good gastric retention which was confirmed by gelation study conducted on Albino rats. X-Ray radiograph authenticated in-vivo gastric retention after administration of prepared in-situ gel. The release study indicates that present DDS delivers drug over a period of more than 12 hours. The factorial equation proved Xanthan Gum and Gelrite's concentration is dominant causing drug release retardation while concentration of Calcium carbonate is not having any effect on drug release.

Keywords: In-situ gel, Esomprazole, Floating gel, Xanthan gum, Gelrite.

Key Points

Known Facts:

1. Frequent Administration of Esomeprazole for treatment
2. Available in tablet form
3. Floating System can be used to enhance bioavailability

Present Study adds:

Research Article | Published: 01 November 2022

Formulation and Assessment of In Vitro Antimicrobial Activity of Herbal Toothpaste

Baburao N. Chandakavathe, Ravindra G. Kulkarni & Shivsharan B. Dhadde

Proceedings of the National Academy of Sciences, India Section B: Biological Sciences (2022)

Abstract

The oral health problems mainly dental caries and periodontal diseases have been considered very serious. Even though the availability of many antimicrobial agents, these are basically chemicals by virtue they alter the oral micro-biota and have unwanted side effects such as tooth staining, vomiting, diarrhoea and development of antimicrobial resistance. The objective of the present investigation was to develop the herbal toothpaste containing pomegranate peel extract and clove oil for prevention and treatment of dental caries and periodontal diseases. Nine herbal toothpastes (TN_1 to TN_9) were prepared containing different concentrations of pomegranate peel extract (0.2–1.8% w/w) and clove oil (1–1.4% w/w) and subjected for pH, spreadability, foaming

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Review Crit Rev Ther Drug Carrier Syst. 2022;39(6):45-83.
doi: 10.1615/CritRevTherDrugCarrierSyst.2022035905.

Grafting of Natural Polymers and Gums for Drug Delivery Applications: A Perspective Review

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Affiliations

PMID: 35997101 DOI: 10.1615/CritRevTherDrugCarrierSyst.2022035905

Abstract

Natural polymers have received more attention because of their advantages over synthetic polymers such as abundant availability, low cost, biodegradability and non-toxicity. However, natural polymers suffer some limitations such as drop-in viscosity upon storage, uncontrolled hydration, solubility, inability to perform under high temperature and pressure (thermal stability), etc. In many instances above mentioned drawbacks of natural polymers limits their applications in drug delivery systems. Grafting of natural polymer leads to improved properties and characteristics of backbones of macromolecules such as improvement in gel strength, swelling index, mucoadhesion, drug targeting and drug release profile. Therefore, in recent decades grafting of the natural polymer has gained immense importance for the development of drug delivery systems. In addition to the pharmaceutical applications graft copolymers are extensively utilized in diversified fields. The present review is an attempt to define the grafting, various methods of polymer grafting and their application in drug delivery.

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INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

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UV SPECTROPHOTOMETRIC METHOD DEVELOPMENT AND VALIDATION OF AZELNIDIPINE IN BULK AND DOSAGE FORM

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DSTSM' College of Pharmacy, Solapur – 413004, Maharashtra, India.

ABSTRACT:

Objective: A new, simple, sensitive, precise and reproducible UV spectroscopic method was developed for the estimation of Azelnidipine in bulk and Formulation.

Methods: The UV spectrum of Azelnidipine in acetonitrile showed λ max at 251 nm. Beer's law is valid in the concentration range of 5-25µg/ml. This method was validated for linearity, accuracy, precision, ruggedness and robustness.

Results: The method has demonstrated excellent linearity over the range of 5-25µg/ml with regression equation y = 0.056x + 0.0593 and regression correlation coefficient r^2= 0.9993. Moreover, the method was found to be highly sensitive with LOD (0.991µg/ml) and LOQ (3.00µg/ml).

Conclusion: Depending on results the given method can be successfully applied for assay of Azelnidipine in formulation.

KEYWORD: Azelnidipine, UV spectroscopy, method development and validation, λ max.

1. INTRODUCTION:

Hypertension is a condition where blood pressure is elevated to an extent that clinical benefit is obtained from BP lowering. Hypertension is one of the most important risk factor for both coronary artery disease and cardiovascular disease [1]. Azelnidipine (AZEL) (3-[1-(diphenylmethyl)azetidin-3-yl] 5-propan-2-yl 2-amino-6-methyl-4-(3-nitrophenyl)-1,4-dihydropyridine-3,5-dicarboxylate) is a new dihydropyridine derivative with calcium antagonistic activity. Azelnidipine is inhibits trans membrane Ca+2 influx through the voltage dependent channels of smooth muscle in vascular walls. They enter the cells through cell membrane, lower peripheral vascular resistance and arterial pressure. It is used for treatment of essential hypertension and angina pectoris [2]. Azelnidipine is Ca+2 channel blocker inhibits trans membrane Ca +2 influx through the voltage dependent channels of smooth muscle in vascular walls. They enter the cells through cell membrane, lower peripheral vascular resistance and arterial pressure.Ca+2 channels are classified into various categories including L-type, T-type, N-type, P/Q- type, R-type Ca+2 channels. Normally, calcium induces smooth muscle contraction, contributing to hypertension. When calcium channels are blocked, the vascular smooth muscle does not contract, resulting in relaxation of vascular smooth muscle walls and decreased BP [3].

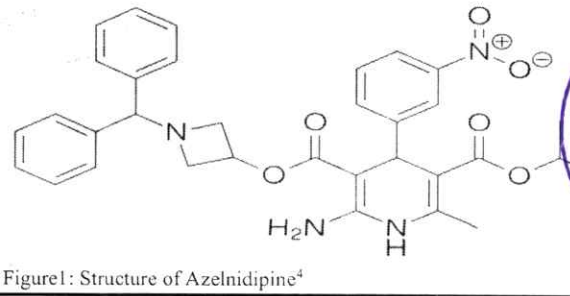

Figure1: Structure of Azelnidipine[4]

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INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

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DEVELOPMENT AND VALIDATION OF RP-HPLC METHOD FOR QUANTIFICATION OF AZELNIDIPINE IN TABLET.

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ABSTRACT:

The analytical method was developed and validated for determination of Azelnidipine in bulk and pharmaceutical dosage forms by High performance liquid chromatography. The separation was carried out on Luna C18 (150 x4.6mm,5µ) column. The mobile phase consists of ACN : Water in the ratio 90:10 at flow rate 1 ml/min at 255nm.The column temperature was adjusted at 30° ± 0.5°C with injection volume 20µl.The retention time of Aelnidipine was 3.5min. The linearity of the calibration curve was linear over the concentration range 10-50µg/ml (r^2=0.999).The validation was carried out as per ICH guidelines. The development of method was easy, rapid, linear, precise, accurate and consistent.

Keywords: Azelnidipine, RP-HPLC, Validation, Chromatogram,Linearity..

1.0 INTRODUCTION:

Hypertension is a condition where blood pressure is elevated to an extent that clinical benefit is obtained from BP lowering. Hypertension is one of the most important risk factor for both coronary artery disease and cardiovascular disease [1]. Azelnidipine (AZEL) (3-[1-(diphenylmethyl)azetidin-3-yl] 5-propan-2-yl 2-amino-6-methyl-4-(3-nitrophenyl)-1,4-dihydropyridine-3,5-dicarboxylate) is a new dihydropyridine derivative with calcium antagonistic activity. Azelnidipine is inhibits trans membrane Ca+2 influx through the voltage dependent channels of smooth muscle in vascular walls. They enter the cells through cell membrane, lower peripheral vascular resistance and arterial pressure. It is used for treatment of essential hypertension and angina pectoris [2]. Azelnidipine is Ca+2 channel blocker inhibits trans membrane Ca +2 influx through the voltage dependent channels of smooth muscle in vascular walls. They enter the cells through cell membrane, lower peripheral vascular resistance and arterial pressure.Ca+2 channels are classified into various categories including L-type, T-type, N-type, P/Q- type, R-type Ca+2 channels. Normally, calcium induces smooth muscle contraction, contributing to hypertension. When calcium channels are blocked, the vascular smooth muscle does not contract, resulting in relaxation of vascular smooth muscle walls and decreased BP [3].

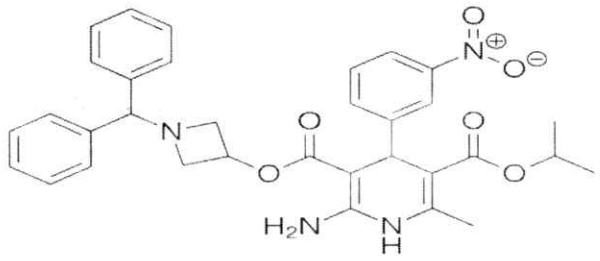

Figure1: Structure of Azelnidipine[4]

The drug is official in Indian Pharmacopiea. A few analytical methods have been reported for the determination of the selected drug. The reported methods for estimation of azelnidipine were UV Spectrophotometric methods [5,6], HPLC [7,8,9,10,11,12], UFLC [13,14], HPLC-MS/MS [15], LC-ESI-MS [16]. Although various HPLC methods were reported in the literature for determining Azelnidipine and impurities in active pharmaceutical ingredients. Retention time is longer in these methods. The present study was aimed to

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Research Article

ANALYTICAL METHOD DEVELOPMENT AND VALIDATION OF RP-HPLC METHOD FOR THE ESTIMATION OF SOFOSBUVIR IN BULK AND FORMULATION

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ABSTRACT

A Reverse Phase High Performance Liquid Chromatographic (RP-HPLC) method was developed and validated for the estimation of Sofosbuvir which is a new antiviral drug. The RP-HPLC was succeeded on a Phenomenex Luna® LC C18 column (150×4.6mm, 5µm). The mobile phase was effective according to the polarity of studied drug. The mobile phase was consisting of Acetonitrile: Methanol: Water in the ratio of 50:30:20 v/v/v using at flow rate of 1ml/min. with injection volume of 20 µL was selected for this present work. Detection was made by using UV detector at 260nm. Retention time was found to be 2.1min. The developed method was validated according to the ICH guidelines. The calibration curve was linear for Sofosbuvir in the concentration range of 10-50 µg/ml was good. The developed method was validated for Linearity, Precision, Accuracy and Robustness of Sofosbuvir drug and was accurate, precise and reliable for the analysis of Sofosbuvir in formulation. The Relative Standard Deviation for all the parameters were found to be less than 2 which shows the validated method and results obtained by this method is with fair agreement. Hence, this developed method can be easily effortlessly adopted for routine analysis for Sofosbuvir in bulk and formulation.

Keywords: Sofosbuvir, Method Development, Validation, RP-HPLC, ICH.

1. INTRODUCTION

The chemical name of Sofosbuvir is propane-2-yl(2S)-2-{[[2R,3R,4R,5R)-5-(2,4-dioxopyrimidin-1-yl)-4-fluoro-3-hydroxy-4-methyloxolan-2-yl]methoxy-phenoxy-phosphosphoryl]amino}propanoate. Its molecular formula is $C_{22}H_{29}FN_3O_9P$ and molecular weight is 529.458g/mol (Fig.1) [1, 2].

Sofosbuvir is an antiviral drug from the nucleotide polymerase inhibitors class, used to treat chronic hepatitis C virus (HCV) infection [3]. Sofosbuvir has approval to treat HCV infected patients with HCV genotype 1, 2, 3 or 4 and also experienced patients including those with HIV-coinfected and compensated cirrhosis. Limited data is available for treatment of chronic HCV infection caused by genotype 5 or 6. Metabolism of Sofosbuvir was cleaved by Cat and CES 1 and eventually activation steps included amino acid removal by histidine triad nucleotide-binding protein 1 (H1NT1) and phosphorylation by uridine monophosphate- cytidine monophosphate (ump-cmp) kinase and nucleoside diphosphate (NDP) kinase [4]. NS5B protein is a RNA dependent RNA polymerase so it is critical for the viral reproduction cycle [5].

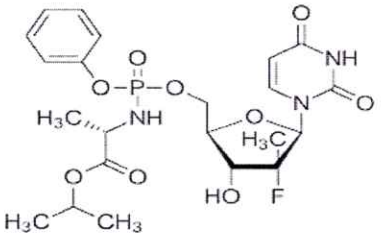

Fig. 1: Structure of Sofosbuvir

Sofosbuvir is a nucleotide prodrug and Hepatitis C Virus (HCV) NS5B polymerase inhibitor with the potential HCV inhibiting activity. Administration of orally dose, Sofosbuvir has metabolized to 2'-deoxy-2'-alpha-fluorobeta-C-methyluridine-5-monophosphate, then converted into the active triphosphate nucleotide that inhibits the NS5B polymerase thereby prevents viral replication [6].

The pharmacokinetics of Sofosbuvir and predominant circulating metabolite GS-331007 have been evaluated in healthy subject and subject with chronic hepatitis C.

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DEVELOPMENT AND VALIDATION OF UV-SPECTROPHOTOMETRIC METHOD FOR THE DETERMINATION OF RILPIVIRINE IN BULK AND TABLET DOSAGE FORM

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ABSTRACT

The present research work was to develop and validate the UV-Spectrophotometric method for the determination of Rilpivirine in bulk and tablet dosage form as per ICH guidelines. A simple, rapid, accurate and precise UV-Spectrophotometric method has been developed by using Ethanol as a solvent for the determination of Rilpivirine in bulk and tablet dosage form. The maxima absorption was found to be 308nm for Rilpivirine. The developed method was found to be linear of the calibration curve over the concentration range of 5-30µg/ml with correlation coefficient value of 0.999. The limit of detection and limit of quantification were found to be in the range of 0.931µg/ml and 2.822µg/ml and the low %RSD values were indicates the accuracy and precise of the method.

KEYWORDS: Rilpivirine, ICH, UV-Spectrophotometric, Method development and validation, Tablet dosage form.

1. INTRODUCTION

Rilpivirine is a non-nucleoside reverse transcriptase inhibitor (NNRTI) which is used for the treatment HIV1 infections in treatment-naive patients. It is a diarylpyrimidine derivative and the internal conformational flexibility of Rilpivirine and the plasticity of it interaction binding site gives it a very high potency and reduces the chance of resistance compared to other NNRTI's. It was developed by Tilbotec and approved by FDA on May20, 2011.[1]

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RESEARCH ARTICLE

Formulation and Evaluation of Anti-acne Gel Cleanser using Bael Leaves Extract

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ABSTRACT:
Now days Usage of herbal products has increased many folds an account of side effects observed with conventional products. In the world increases the demand for uses of herbal products. Acne is a chronic inflammatory condition of skin that causes pimples and spots, on the face, shoulders, back, neck, chest, and upper arms. In present study various attempts were made to develop and evaluate the herbal anti-acne gel containing Bael extract, Neem extract, Honey to facilitate the topical usage. The plants have been reported in literature having good anti-aging, anti-microbial, anti-oxidant, antiseptic, and anti-inflammatory activity. Various formulation batches i.e., F1 to F5 were prepared using Carbopol 940 as gelling agent. The Prepared formulations (F1 to F5) were evaluated for various parameters. Like colour, appearance, consistency, wash ability, pH, spread ability, grittiness, viscosity, homogeneity and skin irritation test. Thus, the topical antiacne gels were safe to apply on the skin without irritation.

KEYWORDS: Anti acne gel cleanser, Bael leaves, Neem leaves, Honey, Rose water.

INTRODUCTION:
Acne is an infection of the skin, caused by changes in sebaceous glands. The most common form of acne is called acne vulgaris, which means "common acne". The redness comes from the inflammation of the skin in response to the infection. Oils from glands combine with dead skin cells to block hair follicles. Under blocked pore, oil builds up. Skin bacteria can then grow very quickly. This infection makes the skin becomes swollen and red, which becomes visible. The face, chest, back and upper arms are most common places for acne to happen[1].

Acne vulgaris is Characterized by various clinical conditions such as scaly red skin, erythematous papules and pustules, comedons, nodules, deep pustules and sometimes pimples. The pathogenicity mechanism of acne was the production of sebum's, follicular hyper keratinization, bacterial colonization, and inflammation[2]. P. acne plays a role in the development of inflammatory acne by activating complements and can metabolize sebaceous triglycerides into fatty acids, which neutrophils were attracted. In addition, S. epidermidis within sebaceous unit responsible in superficial infection. When bacteria colonize into the comedons, then the inflammatory factors are released by those bacteria. This made the comedons transformed into pustules and pimples. The inflamed acne becomes rupture and forms nodulus, also probably forms scars after healing[3].

Acne is common during puberty, when a person is turning from a child into an adult, because of high levels of hormones. Acne becomes less common as people reach adulthood.

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RESEARCH ARTICLE

Formulation and Evaluation of Polyherbal Shampoo Containing Different Herbal extract

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ABSTRACT:
The aim of the present study is to formulate and evaluate polyherbal shampoo containing natural ingredients with an emphasis on safety and efficacy. It clears dirt and dandruff, promotes hair growth, luster, strengthens and darkens the hair. The shampoo is prepared by taking the polyherbal extract from Hibiscus Flowers, Pomegranate Peels, Neem Leaves, Curry Leaves, Shikakai and Amla Fruit in different proportions. Several physicochemical tests were performed for visual assessment, wetting time, pH, viscosity, assurance of solid contents, surface tension, dirt dispersion, conditioning performance and foam stability. The formulated polyherbal shampoo is brown in color with demonstrable good froth stability, good cleansing ability, low surface tension, optimum pH and conditioning activity. Dirt dispersion of polyherbal shampoo is light in colour along with 25 ml foam height. All these are the ideal characteristics of good quality polyherbal shampoo to be used in daily life. However, further scientific investigation is required for validation of its overall quality.

KEYWORDS: Polyherbal shampoo, natural ingredients, hair care, evaluation of shampoo

INTRODUCTION:

Polyherbal shampoo is a cosmetic preparation which uses herbs from plants and it is meant for washing of hair and scalp just like a regular shampoo.[1,2] Polyherbal formulations are considered as alternative to synthetic shampoo. The polyherbal shampoo is important, as people nowadays prefer polyherbal products than chemical ones to enhance health. The awareness and need for cosmetics with herbs are on the rise, primarily because it is believed that these products are safe and free from side effects. The selection of active ingredients for hair care is based on the ability of the ingredient to prevent hair damage as well as to improve the quality of hair by cleansing, nourishing and protecting the hair.[3] We therefore made an attempt to develop a basic protocol for polyherbal shampoo formulation for effective hair care.

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The polyherbal shampoo was formulated containing ingredients such as Hibiscus Flower (Hibiscus rosa-sinensis), Pomegranate Peel (Punica granatum), Neem Leaves (Azadirachta indica), Curry Leaves (Murraya koenigii), Shikakai Fruit (Acacia concinna) Amla Fruit (Emblica officinalis), etc. and evaluated for its physicochemical properties.

Advantages of polyherbal shampoo

1) Polyherbal shampoos for hair fall are made out of natural ayurvedic ingredients, natural oils, minerals, and polyherbal extracted compounds. These ingredients work on to improve the moisture in your hair by hydrating the follicles and roots of your hair. This in turn reduces the chances of hair fall, loose, dry, and damaged hair.
2) Polyherbal shampoo are free of any side effects, harmful or toxic effects.
3) Polyherbal shampoos for hair growth are made to strengthen the hair follicles by giving essential oils and nourishment all through the root and follicles. This, in turn, promotes hair growth and stimulates the formation of new and healthy hair roots.

Principal
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Development and Validation of Novel UV Spectroscopy Method for the Estimation of L-Glutathione in Bulk and Formulation with Congo Red

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ABSTRACT:

A novel UV-Spectroscopy method was developed and validated for the estimation of L-glutathione in bulk and dosage form with congo red. The wavelength at which L-glutathione and congo red mixture product showed maximum absorption at 568nm in distilled water. The developed method range was found to be10-90µg ml. The developed method validated for linearity, precision, range, limit of detection, the limit of quantification, robustness, specificity, system suitability. The regression equation was found to be $y = 0.0045x - 0.121$ with correlation coefficient $R^2 = 0.9983$. The limit of detection and the quantification limit was 5.05 µg ml and 15.32 µg ml respectively. The developed method was found to be linear, precise, robust, economical for the evaluation of L-glutathione in bulk and dosage form.

KEYWORDS: L-glutathione, Congo red, UV-spectrophotometer, Linearity, Precision.

INTRODUCTION:

Glutathione (GSH) is chemically known as (2S)-2-amino-4-[[(1R)-[(carboxymethyl) carbamoyl]-2-sulfanylethyl] carbamoyl] butanoic acid. Glutathione exists in reduced and oxidized states. Its molecular formula and molecular weights are C10H17N3O6S and 307.32 g mol. It is used as anti-aging, skin whitening, and anti-acne, protecting the liver. L-Glutathione also plays a role in the hepatic biotransformation and detoxification process. It acts as a hydrophilic molecule that is added to other lipophilic wastes before entering biliary excretion. A tripeptide with many roles in cells. It conjugates to drugs to make them more soluble for excretion. It is a cofactor for some enzymes.

It is involved in protein disulfide bond rearrangement and reduces peroxides. L-Glutathione is freely soluble in water, diluted alcohol, liquid ammonia, and dimethylformamide. Glutathione is an endogenous peptide with antioxidant and other metabolic functions. Glutathione and glutathione sodium is used to prevent neurotoxicity associated with cisplatin.

Principal
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49

UV SPECTROPHOTOMETRIC METHOD DEVELOPMENT AND VALIDATION FOR DETERMINATION OF POSACONAZOLE IN BULK AND PHARMACEUTICAL DOSAGE FORM

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ABSTRACT

A new, simple, sensitive, accurate and precise UV Visible Spectrophotometric method was developed and validated for the determination of Posaconazole in bulk and pharmaceutical dosage form. The UV spectrum of Posaconazole in acetonitrile showed the maximum absorbance (λ_{max}) at 263 nm. The method was proved linear in the range of 5-25 µg/ml and exhibited good correlation coefficient (R^2 = 0.9991). The % RSD for intraday and inter-day precision was found to be 0.885944 and 1.030571 respectively. The LOD and LOQ of Posaconazole was found to be 0.921 and 2.79 respectively. The developed method was validated for linearity, precision, accuracy and robustness, as per ICH guidelines. The obtained results proved that the method can be recommended for the routine analysis of Posaconazole in bulk as well as pharmaceutical dosage form.

KEYWORDS: Posaconazole, Spectrophotometric method, Method Development and Validation, Acetonitrile.

INTRODUCTION

Posaconazole, chemically 4-[4-[4-[4-[[(3R,5R)-5-(2,4-difluorophenyl)tetrahydro-5-(1H-1,2,4-triazol-1-ylmethyl)-3-furanyl]methoxy]phenyl]-1-piperazinyl]phenyl]-2-[(1S,2S)-1-ethyl-2-hydroxypropyl]-2,4-dihydro-3H-1,2,4-triazol-3-one, is a synthetic systemic triazole antifungal agent, approved by Food and Drug Administration (FDA) in the year 2006, for use as prophylaxis against invasive *Aspergillus* and *Candida* infections in severely immunocompromised patients.[1,2] Posaconazole's chemical formula is $C_{37}H_{42}F_2N_8O_4$ and has a molecular weight of 700.8 gm/mol.[3] It is the first azole agent to demonstrate activity

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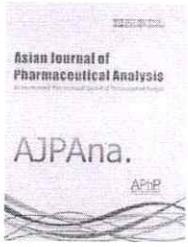

RESEARCH ARTICLE

Development and Validation of Novel UV Spectroscopy Method for the Estimation of L-Glutathione in Bulk and Formulation with Congo Red

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Solapur 413004, Maharashtra, India.
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ABSTRACT:
A novel UV-Spectroscopy method was developed and validated for the estimation of L-glutathione in bulk and dosage form with congo red. The wavelength at which L-glutathione and congo red mixture product showed maximum absorption at 568nm in distilled water. The developed method range was found to be10-90µg/ml. The developed method validated for linearity, precision, range, limit of detection, the limit of quantification, robustness, specificity, system suitability. The regression equation was found to be y = 0.0045x + 0.121 with correlation coefficient R^2 = 0.9983. The limit of detection and the quantification limit was 5.05 µg/ml and 15.32 µg/ml respectively. The developed method was found to be linear, precise, robust, economical for the evaluation of L-glutathione in bulk and dosage form.

KEYWORDS: L-glutathione, Congo red, UV-spectrophotometer, Linearity, Precision.

INTRODUCTION:
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It is involved in protein disulfide bond rearrangement and reduces peroxides. L-Glutathione is freely soluble in water, diluted alcohol, liquid ammonia, and dimethylformamide. Glutathione is an endogenous peptide with antioxidant and other metabolic functions. Glutathione and glutathione sodium is used to prevent neurotoxicity associated with cisplatin.

Congo red is an organic compound. The sodium salt of 3,3′-([1,1′-biphenyl]-4,4′-dial)bis(4-amino naphthalene-1-sulfonic acid). It is an azo dye. Congo red is water-soluble showing a red colloidal solution. Its solubility is greater in organic solvents.

In the literature review, various methods are available for the determination of L-Glutathione by spectrofluorimetric methods chemiluminescence methods, chromatographic methods, spectrophotometric methods. The present work is concentrated to achieve the optimum chromatographic conditions for the

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INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

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DESIGN AND DEVELOPMENT OF NANOEMULSION FORMULATION: A REVIEW

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ABSTRACT:

Nanoemulsion are relatively stable physically, because the droplet doesn't collide as frequently as in ordinary emulsions and their small droplets sizes enable them to penetrate deep into the tissues through fine capillaries. Thus, such emulsion is being investigated extensively as drug carriers and for its ability to specialize in specific sites within the body. A completely unique Drug Delivery System for enhancement of water solubility of poorly soluble drugs and high first pass metabolism. Nanoemulsion have small droplets size 10-200 nm, high solubilization capacity, high interfacial area, low viscosity, transparent or translucent appearance, and high kinetic stability, and used for various applications. A thermodynamically stable, longer self-life nanoemulsion and remain uniformly dispersed throughout the continuous phase. During this review aim to supply information regarding selection of excipients, Methods for Formulation, Optimization Parameters, Instabilities in Formulation, and thus the numerous applications utilized within the formulation of nanoemulsion.

Keywords: Nanoemulsion, Types, Methods, Optimization, Instabilities, Applications.

1. INTRODUCTION:

In pharmaceutical observation, nanoemulsion is one among the chief dosage forms in delivering active ingredients to the target which features a superb attention in recent years for its application in various fields. As nanoemulsions are used as a drug delivery system through various systemic routes like oral, topical and parenteral.[i]

The term Nanoemulsion is said to a thermodynamically stable clear solution of two non-soluble liquids, like oil and water, stabilized by an interfacial film of surfactant molecules. Nanoemulsions are novel drug delivery system includes an emulsified oil and water systems having mean droplet size which ranges from 50 to 1000 nm. The emulsions and nanoemulsions differ mainly in the size and shape of the particles dispersed in continuous phase. The particle size in nanoemulsions is (10-200 nm) and of conventional emulsions are (1-20μm).[ii]

Nanoemulsions, also mentioned as submicron emulsions, ultrafine emulsions and mini emulsions, are submicron sized colloidal particulate systems considered as thermodynamically and kinetically stable isotropic dispersions, which contains of two immiscible liquids like water and oil, stabilized by an interfacial film consisting of an appropriate surfactant and co-surfactant to make one phase. A kind of surfactants with diverse characteristics (ionic or non-ionic) had been used with nanoemulsions.[iii]

High energy and low energy methods are used for formulation of nanoemulsion. Optimization of nanoemulsion by change in various parameters. During or after the formulation chemical and physical instabilities also are observed and application in various fields are discussed during this review.

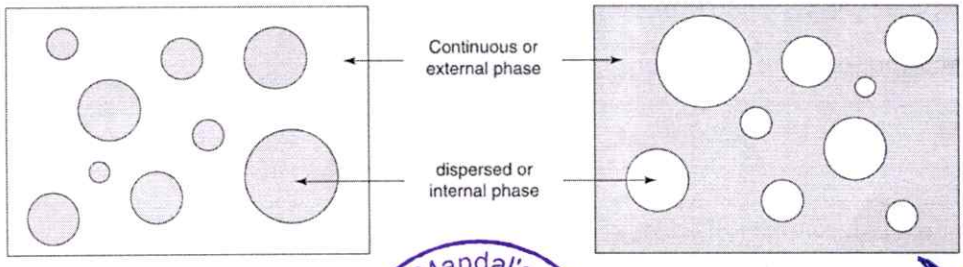

Figure 1 : Oil in Water(O/W) and Water in Oil(W/O) Emulsion

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Research Article

DESIGN AND DEVELOPMENT OF LULICONAZOLE AND CURCUMIN LOADED NANOEMULSION FOR THE TRETMENT OF FUNGAL WOUND INFECTION

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Luliconazole, Curcumin, Nanoemulsion, Fungal wound infection. High Speed Homogenization

ABSTRACT

The object behind this research work wasto enhances the solubilityoflipophilicdrugs by using nanoemulsiontechnique. Nanoemulsion drug delivery system is an innovative tool and play an increasingly important role in drug delivery as they can reduce toxicity and modify pharmacokinetic and bioavailability. Luliconazole and Curcumin used as topical antifungal drug. Antifungal agents used in many dermatological diseases, used to treat mycosis such as athlete foot, ringworm and candidiasis. Topically applied nanoemulsion can increase the residence time of drugs in the stratum corneum and epidermis, while reducing the systemic absorption of the drug. This drug is used in patient with tinea pedis, tinea cruris and tinea corporis. Foot fungal skin infections (tinea pedis, also called athlete's foot) is the most common fungal infection in the general population. Nanoemulsion containing Luliconazole and Curcumin was prepared by high-speed homogenization technique using different concentration of Linseed oil, DGME and non-ionic co-surfactants (Tween80). Nine nanoemulsion formulations were prepared (F1-F9) and evaluated for physical appearances, pH, Viscosity, Drug Content and FTIR studies. As, nanoemulsion improves the topically a high degree of skin permeation and prolongs maintenance of drug by increasing the retention time in the target area at a therapeutic level thereby decreasing the frequency of administration and increasing patient compliance. The synergistic effect of Luliconazole and Curcumin help to recover the fungal wound infection. Topical W/Onanoemulsion was homogeneous, transparent and free from particulate matter containing a high concentration of surfactant and co-surfactant.

INTRODUCTION

Skin is the largest organ exposed to variety of infection caused by bacteria, fungi and viruses. Fungal infection refers to mycosis. Topical drug delivery is effective way to treat fungal wound infection due to its local action at site of infection. Topical administration of drug in the body can be through ophthalmic, rectal, vaginal and skin routes. Antifungal drugs are lipophilic compounds, which are insoluble in water and having high permeability of stratum cornea. Ergosterol is an integral part of fungal cell membrane, anti-fungal agents interfere with biosynthesis of ergosterol an important component of fungal cell wall this causing inhibition of fungal growth and replication.[1]

Luliconazole, a topical broad-spectrum imidazole antifungal drug belonging to dichlorobenzene class of organic compounds is an optically active Renantiomer. It had been approved in November 2013 by FDA for the treatment of fungal infections caused by *Trichophyton rubrum* and *Epidermophyton floccosum*, specifically tinea pedis, cruris, and corporis, reported to be safe and well tolerable by human subjects.[2]

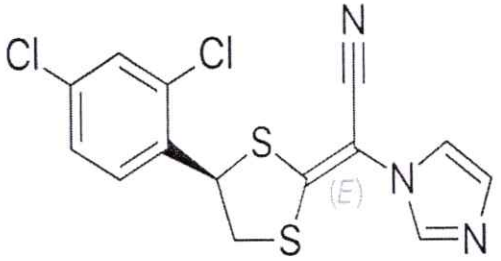

Figure 1 Structure of Luliconazole

The chemical name of Luliconazole is 2-[(2E,4R)-4-(2,4-dichlorophenyl)-1,3-dithiolan-2- ylidene]-2-(1H-imidazole-1-yl) acetonitrile. Luliconazole has molecular formula is $C_{14}H_9CL_2N_3S_2$and its relative molecular mass is 354.267 g/mol. The Pka value of Luliconazole has 6.34. Luliconazole inhibit the enzyme lanosterol demethylase. It is needed for synthesis of

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Original Article

DEVELOPMENT AND VALIDATION OF UV SPECTROPHOTOMETRICMETHOD FOR QUANTITATIVE ESTIMATION OF GLIPIZIDEIN PHARMACEUTICAL DOSAGE FORM

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ABSTRACT

Objective: The present work is aimed to develop a simple, rapid, selective and economical UV spectrophotometric method for quantitative determination of Glipizideinbulk and pharmaceutical dosage form.

Methods: In this method Dimethyl Form amide (DMF) was used as solvent, the absorption maxima was found to be275 nm in DMF. The developed method was validated for linearity, accuracy, precision, ruggedness, robustness, LOD and LOQ in accordance with the requirements of ICH guideline.

Results: The linearity was found to be 10-60 µg/ml having linear equation y=0.017x-0.006 with correlation coefficient of 0.997. The% recovery was found to be in the range of 98.7-100%. The % RSD for intra-day and inter-day precision was found to be 0.569923 and 0.40169 respectively. The limit of detection (LOD) and limit of quantification (LOQ) was found to be3.06 µg/ml and 9.27 µg/ml respectively.

Conclusion: The developed method was validated as per ICH Q2(R1) guidelines. The novel method is applicable for the analysis of bulk drug in its pharmaceutical dosage form.

Keywords: Glipizide, UV-Spectrophotometric method, Method Development and validation, Dimethyl Form amide

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INTRODUCTION

Glipizide (1-cyclohexyl-3-[[4-[2-[[(5-methylpyrazine-2-yl) carbonyl] amino] ethyl] phenyl] sulphonyl] urea), [1]is a second-generationsulfonyl urea derivative that is widely used as oral antihyperglycemic drug for the treatment non-insulin dependent diabetes mellitus [2-6].

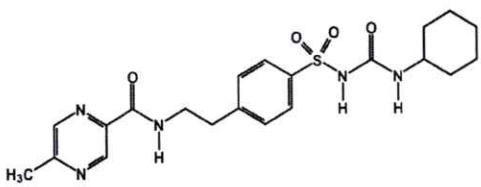

Fig. 1: Structure of glipizide

The present study is aimed to develop a simple, rapid, selective and economical UV spectrometric method for quantitative determination of Glipizide in bulk and pharmaceutical dosage form. The method was demonstrated as per ICH Q2(R1) guidelines [7-11].

MATERIALS AND METHODS

Materials used

Pure standard Glipizide was obtained as a gift sample from Ajanta pharma Ltd. Mumbai. Commercial tablet of Glipizide formulation was purchased as research sample from Wockhardt Ltd, Aurangabad. DMF is used as a solvent.

Instrument used

UV-Visible double beam spectrophotometer (Systronics-2201) with 1 cm matches quartz cell, electronic balance (SHIMADZU-AY220) and asonicator (Oscar ultrasonic cleaner Microclean-103) was used in the study.

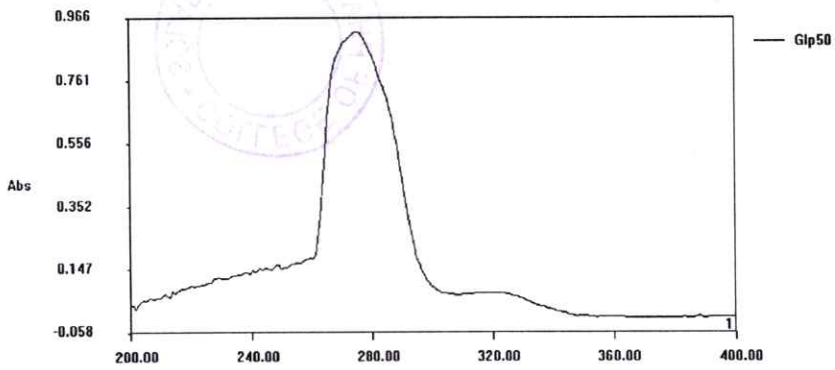

Fig. 2: Absorption maxima of glipizide at 275 nm

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Research Article

DEVELOPMENT OF LIPOSOMAL SYSTEM OF BIFONAZOLE FOR IMPROVED TOPICAL APPLICATION

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Bifonazole, Fungal infection,Gel, Liposomes, Lipids.

ABSTRACT

Liposomes are microscopic spherical vesicles with one or more lipid bilayers with an aqueous cor that are lengthily used as carriers for numerous molecules in cosmetic and pharmaceutical industries. Liposomes can trap both hydrophobic and hydrophilic compounds, avoid decomposition of the entrapped combinations and release the entrapped drug at designated targets. Liposomal gel encapsulation and gel formulation found to increase the skin permeation, deposition and more drug retention at site of action.

Superficial fungal infections (dermatomycoses) of the skin are among the most common diseases observed in our daily practice and occur throughout the world. Bifonazole is a substituted imidazole antifungal agent. Bifonazole possesses a broad spectrum of activity *in-vitro* against dermatophytes, moulds, yeasts, dimorphic fungi and some gram-positive bacteria.

Liposomal gel of Bifonazole was prepared to enhance the solubility of hydrophobic Bifonazole, improve the topical application and drug retention at site of action, reduce the side effects of drug and hence increase the patient compliance. Liposomal gel was prepared by thin film hydration technique using different concentration ratios of soya lecithin and cholesterol. Different formulation batches were prepared and evaluated for various parameters like physical appearance, viscosity, drug content, entrapment efficiency and FT-IR studies.

Formulated liposomal gel of Bifonazole was homogenous, clear and showed better entrapment efficiency, dug content, improved solubility and drug retention at the site of action with reduced side effects and hence increase the patient compliance.

INTRODUCTION

Superficial fungal infections (dermatomycoses) of the skin are among the most common diseases observed in our daily practice and occur throughout the world. These infections are contagious caused by either a human (zoophile) or animal species of dermatophyte fungi. Tinea pedis, athlete's foot or ringworm is the most common dermatophytosis and may affect up to 70% of adults worldwide. Most cases of Tinea pedis respond to topical antifungal agents.[1]

Topical drug delivery of antifungal drugs is perhaps the best route against major skin dermatophytes, ensuring its direct access, reduced systemic toxicity, avoid pre-systemic metabolism. Various antifungal drugs are used as topical administration to skin by spreading or rubbing. Topical delivery of antifungal drugs can cause adverse skin reactions like allergic reaction and itching.[2]

Skin acts as a major target as well as a principal barrier for topical drug delivery. The greatest challenge for dermal delivery is stratum corneum and in order to improve its permeability, new formulation approaches have been investigated. Types of formulation as well as physicochemical characteristics of drug molecules are effective parameters in topical delivery of drugs.[3]

Bifonazole is a substituted imidazole antifungal agent. Bifonazole possesses a broad spectrum of activity *in-vitro* against dermatophytes, moulds, yeasts, dimorphic fungi and some gram positive bacteria. Compared with majority of topical antifungal drugs, which need to be applied at least twice daily, Bifonazole offers convenience of once daily administration, which may improve patient compliance.[4]

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Research Article

OXICONAZOLE NANO-EMULGEL: DESIGN AND DEVELOPMENT FOR PROLONGED DRUG DELIVERY

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Oxiconazole, Nano-emulgel, Fungal infection, High Speed Homogenization, Hot plate method

ABSTRACT

The object behind this research work was to enhances the solubility of lipophilic drugs by using nanoemulsion technique and by incorporating it into gel thereby prolonging the release of the drug. Nanoemulsion drug delivery system is an innovative tool and play an increasingly important role in drug delivery as they can reduce toxicity and modify pharmacokinetic and bioavailability. Oxiconazole used as topical antifungal drug. Antifungal agents used in many dermatological diseases, used to treat mycosis such as athlete foot, ringworm and candidiasis. Topically applied nano-emulgel can increase the residence time of drugs in the stratum corneum and epidermis, while reducing the systemic absorption of the drug. This drug is used in patient with tinea pedis, tinea cruris and tinea corporis. Foot fungal skin infections (tinea pedis, also called athlete's foot) is the most common fungal infection in the general population. Nanoemulgel containing Oxiconazole was prepared by a method which combines hot plate method and high-speed homogenization technique using Isopropyl myristate as oil phase, DGME and non-ionic co-surfactants (Tween80). Nine nanoemulgel formulations were prepared (F1-F9) and evaluated for physical appearances, pH, Viscosity, Drug Content and FTIR studies. As, nanoemulgel improves the topically a high degree of skin permeation and prolongs maintenance of drug by increasing the retention time in the target area at a therapeutic level thereby decreasing the frequency of administration and increasing patient compliance.

INTRODUCTION

Dermatophytes are fungi that invade and multiply within keratinized tissue (skin,hair and nails) causing infection. Athlete's foot also called tinea pedis is a fungal infection that affects the skin on the feet usually between the toes. Jock itch also known as tinea cruris is a fungal infection in the skin of the genitals, inner thigh and buttocks. Ringworm is a highly contagious fungal infection of the skin or scalp.[1]

Topical antifungal therapy offers the advantage of less systemic side effects and complications over oral antifungal therapy.Treatment of athlete's foot (tinea pedis), Jock itch (tinea cruris) and ringworm involves the use of topical antifungal agents. Topical drug delivery limits the dissolution and diffusion of the hydrophobic drugs. Hence, to overcome this limitation emulgel is prepared.[2]

Nano-emulgel is a combination of nanoemulsion and gel. Oil in water and water in oil emulsion both can be used as a vehicle for various drugs. Emulgels are stable and better vehicle for the topical drug delivery of hydrophobic or poorly water soluble drugs. Oxiconazole is a broad spectrum antifungal agent. It is class-II drug in biopharmaceutical classification with low aqueous solubility and poor systemic absorption.[3]

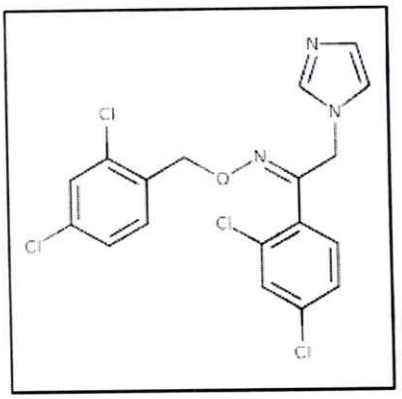

Figure 1 Chemical structure of Oxiconazole

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UV SPECTROPHOTOMETERIC METHOD DEVELOPMENT AND VALIDATIONFOR ESTIMATION OF NITROFURANTOIN IN BULK AND TABLET DOSAGE FORM

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ABSTRACT:
Objective: The objective of the present work is to develop a new, simple, sensitive and precise UV spectrophotometric method for Nitrofurantoin in bulk and pharmaceutical formulation as per ICH guidelines.
Method: The UV spectrophotometric method has been developed using by Dimethylformamide : Methanol as solvent to determine the Nitrofurantoin in bulk and pharmaceutical formulation. The λ_{max} of Nitrofurantoin in Dimethylformamide : Methanol was found to be 369.6 nm.
Results: The drug was proved linear in the concentration range of 2-10 µg/ml and regression coefficient was found to be 0.999. The LOD and LOQ of Nitrofurantoin was found to be 0.468821 and 1.420671 respectively. This method was successfully applied to Nitrofurantoin in marketed formulation and results were in good agreement with label claims.
Conclusion: Depending on the results, the given method can be successfully applied for assay of Nitrofurantoin in Tablet formulation.

KEYWORDS:
Nitrofurantoin, Validation, Specificity, LOD, LOQ

Introduction
Nitrofurantoin is an antibiotic drug applicable for the care for bladder infections. It is not efficient for kidney infections. Nitrofurantoin taken by oral cavity[1]. Nitrofurantoin is an antibiotic drug that fights bacteria in the human body. Nitrofurantoin is used to treat urinary tract infections(UTI). We should not take Nitrofurantoin if you have severe urination problems, kidney disease or a history of jaundice or liver problems caused by nitrofurantoin[2].

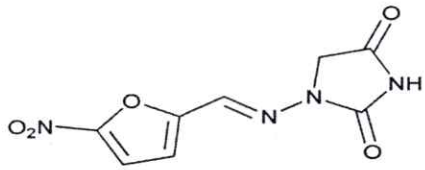

Fig 1. Chemical Structure of Nitrofurantoin

Molecular formula and weight of Nitrofurantoin is $C_8H_6N_4O_5$ and 238.16 g/mol respectively[1]. Nitrofurantoin is practically insoluble in water but soluble in Methanol, ethanol, acetone and ethyl acetate. Analytical methods are reported for determination of Nitrofurantoin by UV Visible spectroscopy[2-4]. The aim of this study is to give a new, simple, sensitive, precise and reproducible UV spectroscopic method was developed for Nitrofurantoin in Tablet formulation.

MATERIALS AND METHODS:
Materials:
Nitrofurantoin was obtained as gift sample from
Instruments:
Analytical balance (Shimadzu AY220), Sonicator (Microclean-1103), UV-Visible spectrophotometer (Systronic 2201).

Experimental:
Preparation of standard stock solution:
Accurately weighed 10 mg of Nitrofurantoin was transferred to a 10 ml volumetric flask; dissolved in Dimethylformamide : Methanol (70:30) and volume was made upto the mark with Dimethylformamide : Methanol (70:30). (Conc: 1000µg/ml)

Working Standard:
Add 0.1 ml of standard stock solution in 10 ml volumetric flask and add 5 ml of Dimethylformamide : Methanol (70:30), mix for 2 min and make up the volume upto 10 ml with Dimethylformamide : Methanol. (Conc: 10 µg/ml) Selection of analytical wavelength was done by scanning above solution in the range 200-400 nm

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UV SPECTROPHOTOMETRIC METHOD DEVELOPMENT AND VALIDATION OF OXICONAZOLE IN BULK AND SEMISOLID DOSAGE FORM

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ABSTRACT

A new, simple, sensitive, precise, and reproducible UV spectroscopic method was developed for the estimation of Oxiconazole nitrate in bulk and Semisolid Formulation. The UV spectrophotometric method was developed and validated for quantitative estimation of Oxiconazole. Oxiconazole is soluble in acetonitrile, methanol, and a mixture of methanol and ethanol in a ratio of 70:30v/v. Oxiconazole was dissolved in the mixture of methanol and ethanol (70:30) and the resulting solution was scanned in the UV range (200-400nm). The λmax was found to be 220nm. The concentration range for analysis was 5.5-7.5µg/ml. The developed method was validated for linearity, accuracy, precision, robustness, LOD, and LOQ. Linearity was obtained in the range of 5.5-7.5µg/ml and the regression coefficient was found to be 0.9943. LOD and LOQ were found to be µg/ml and µg/ml, respectively. The method was reproducible with accuracy. Hence, can be used for routine analysis of Oxiconazole.

KEYWORDS: UV spectroscopy, method development, and validation, RO Water, Semisolid Formulation, Oxiconazole nitrate.

INTRODUCTION

Oxiconazole is a topical antifungal agent used in the treatment of tinea corporis, tinea cruris, and tinea pedis.[1],[2] It is available on market in form of cream. Its antifungal activity is primarily due to the inhibition of ergosterol biosynthesis. Ergosterol is a vital component for cell membrane integrity. The molecular formula of Oxiconazole is C18H13Cl4N3O and its

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DEVELOPMENT AND VALIDATION OF UV SPECTROSCOPY METHOD FOR THE ESTIMATION OF CLOBETASOL PROPIONATE IN BULK AND FORMULATION

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ABSTRACT

The spectroscopic method was developed for the estimation of clobetasol propionate in bulk and Formulation. The UV spectrum of Clobetasol propionate in Acetonitrile showed λ max at 240nm. Beer's law is valid in the concentration range of 2.5-12.5µg/ml. This method was validated for linearity, accuracy, precision, LOD, and LOQ. The method has demonstrated excellent linearity over the range of 2.5-12.5µg/ml with regression equation y = 0.0668x - 0.0253 and regression correlation coefficient r2= 0.998. Moreover, the method was found to be highly sensitive with LOD (0.71µg/ml) and LOQ (2.16µg/ml). Depending on the results the given method can be successfully applied for the assay of clobetasol propionate in the formulation.

KEYWORDS: UV spectroscopy, method development, and validation, Formulation, clobetasol propionate.

INTRODUCTION

Clobetasol propionate is a corticosteroid used to treat skin conditions such as eczema, contact dermatitis, seborrheic dermatitis, and psoriasis. It is applied to the skin as a cream, ointment, or shampoo. Use should be short-term and only if other weaker corticosteroids are not effective. Use is not recommended in rosacea or perioral dermatitis. Common side effects include skin irritation, dry skin, redness, pimples, and telangiectasia. Serious side effects may include adrenal suppression, allergic reactions, cellulitis, and Cushing's syndrome. Use in

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UV SPECTROPHOTOMETERIC METHOD DEVELOPMENT AND VALIDATIONFOR ESTIMATION OF PROGESTERONE IN BULK AND TABLET DOSAGE FORM

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ABSTRACT:

Objective: The objective of the present work is to develop a new, simple, sensitive and precise UV spectrophotometric method for Progesterone in bulk and pharmaceutical formulation as per ICH guidelines.

Method: The UV spectrophotometric method has been developed using by Dimethylformamide : Methanol as solvent to determine the Progesterone in bulk and pharmaceutical formulation. The λ_{max} of Progesterone in Dimethylformamide: Methanol was found to be 322.4 nm.

Results: The drug was proved linear in the concentration range of 2-10 µg/ml and regression coefficient was found to be 0.9994. The LOD and LOQ of Progesterone was found to be 0. 776063 and 2.3571 respectively. This method was successfully applied to Progesterone in marketed formulation and results were in good agreement with label claims.

Conclusion: Depending on the results, the given method can be successfully applied for assay of Progesterone in Tablet formulation.

KEYWORDS:

Progesterone, Validation, Specificity, LOD, LOQ

Introduction

Progesterone is a steroid hormone with important functions to reproduction. Drugs with progestogens are used in humans for endometrial protection, dysfunctional exploiting, treatments in pre- or postmenopause, pregnancy maintenance in helped reproduction treatment, and prevention of premature birth. In veterinary drug, exogenous progesterone is used specially for cattle in fixed-time artificial insemination protocol, aimed at the synchronization of estrus in women and improvements in fertilization rates. The usage of estrus cycle control methods, besides facilitating the management of livestock, allows expanding the usage of artificial insemination, accelerating genetic enhancement and bringing improvements to the production of meat and milk.[1-4]

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Formulation of solid lipid nanoparticles containing *Hibiscus rosa-sinensis* (L.) extract

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Abstract

Hibiscus rosa-sinensis is a genus of flowering plants in the mallow family Malvaceae. It is known as Jaswandi or gudhal in Mahara India. The recognized Indian systems of Medicine are Ayurveda, Siddha and Unani, which use herbs and minerals in the formulati India which use 15 agro-climatic zones, 4700 plant species of which 15000 are reported to have medicinal properties varying degr *Hibiscus rosa-sinensis* flower used for treatment of many ailments including constipation stomach upset, hair fall, CNS disorder lik depression. extract of *Hibiscus rosa-sinensis* flowers contain vitamins, flavonoids, ascorbic acid, niacin, riboflavin, thiamine and cyaniding diglucoside. Quercetin-3-diglucoside, cyanidin-3-sophoroside-5-glycosides, 3,7-diglucoside, cyanidin-3, 5-diglucoside ha been isolated from deep yellow flowers. Flowers of *Hibiscus rosa-sinensis* can also be made into a kind of pickle or used as a pur for colouring foods such as preserved fruit and cooked vegetables. Solid lipid nanoparticles (SLNs) are considered to be the most effective lipid based colloidal carriers, introduced in early nineties. This study was aimed to formulating the *hibiscus rosa-sinensis* loaded solid lipid nanoparticles using Cow's ghee as lipid core. In the present research work Solid lipid nanoparticles of extract *hit rosa-sinensis* were prepared high speed homogenization method. The SLN sparticle size analysis depicts that the SLN swere ran from 222nm to 3264.7nm. These SLN sprepared cow ghee shows Heterogeneous distribution and. SLNs shows maximum entrap 81.14%. The optimized batch gives 99.21% release in phosphate buffer. It also observed in the physical examination of all batche showed better stability at room temperature.

Keywords

Hibiscus rosa-sinensis extract, Solid lipid nanoparticles, Cow ghee etc.

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UV VISIBLE SPECTROPHOTOMETRIC METHOD DEVELOPMENT AND VALIDATION FOR DETERMINATION OF PAZOPANIB HYDROCHLORIDE IN BULK AND TABLET DOSAGE FORM

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ABSTRACT

A new simple, accurate, sensitive, and precise uv visible Spectrophotometric method was developed and validated for the determination of Pazopanib hydrochloride in bulk and tablet dosage form. The Pazopanib hydrochloride showed the maximum absorbance at 271 nm in uv range (200-400 nm). The developed method was proved linear in the range of 5-25 µg/ml and displayed good regression coefficient (R^2 = 0.998). The % RSD for interday precision and intraday precision was 0.087 and 0.188 respectively. The LOD and LOQ found to be 1.2187 µg/ml and 3.6932 µg/ml respectively. The proposed method was validated for linearity, accuracy, precision, sensitivity and robustness as per ICH guidelines. The results obtained shows that the developed method can be utilized for routine analysis of Pazopanib hydrochloride in bulk and tablet dosage form.

KEYWORDS: Pazopanib hydrochloride, Ethanol, Uv spectrophotometric method, Method Development.

INTRODUCTION

The IUPAC name of Pazopanib hydrochloride is 5-[[4-[(2,3-dimethylindazole-6-yl)-methyl amino] pyrimidin-2yl]amino]-2-methylbenzenesulfonamide. The molecular formula of Pazopanib hydrochloride is $C_{21}H_{23}N_7O_2S$. HCl.[1] It is an anticancer agent with very low aqueous solubility and oral bioavailability.[2] It is a multityrosine kinase inhibitor which inhibit tumour growth and inhibit angiogenesis. It inhibits vascular endothelial growth factor receptor (VEGFR)1, VEGFR2, VEGFR3, platelet derived growth factor receptor (PDGFR) α and β, fibroblast growth factor receptor (FGFR), interleukin 2 receptor.[3] It is indicated in 1st

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Short Communication

Open Access

Commentary on: *In Silico* Design and Pharmacological Evaluation of Conjugates of Atenolol with Modified Saccharides for Cardiovascular Targeting

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Abstract:

The sugar-macromolecule conjugates-based drug delivery systems are discovered to be more successful targeted drug delivery systems needed for targeting the particularity of cardiovascular medications. The planned medication transporter biomolecules complex surface will comprise of saccharide layer to minimize nonspecific interactions, and to mediate selective receptor focusing on.

Use of glycoconjugates in particular drug delivery to limit drug loss by degradation, prevent harmful side effects, and increase bioavailability is affirmed and aftereffects of cell line studies may yield evidence for specific heart delivery. This methodology of upgrading delivery and pharmacological impact of medication by conjugating it with the biodegradable and biocompatible polymeric system is relied upon to improve the selectivity of medication delivery for the treatment of cardiovascular diseases.

The main purpose of the article was to conjugate the cardiovascular drug with the modified Saccharide for cardiovascular targeting. Drug release analysis and cellular uptake study were carried out using H9c2 cell lines. Brine shrimp lethality bioassay was carried out to investigate the cytotoxicity of synthesized complex and conjugates. In silico analysis was performed to assess the possible binding of the developed conjugates with the GLUT-4, Homology model of the GLUT-4 was developed using the SWISS-MODEL server.

Keywords: *Biopolymer; Galactose; Pectin; Chitosan; Chemical modification; Atenolol*

Introduction

Cardiovascular infections are one of the leading causes of mortality and morbidity in developed as well as developing countries and have become a critical medical issue for all countries because of the unstoppable trend of aging and obesity in the population [1]. Thus, although there are systemic medications for some cardiovascular diseases, the available approaches of drug therapy face a critical problem of a variety of side effects due to the presence of the target for a drug at various organs and systems. Few of them also create other pathological complications. Hence, it is much needed to address the issue by reducing side effects and improving drug delivery specific to the ideal site of activity. Hence, exploration of approaches for targeted drug delivery can be utilized to increase the specificity of biological action without the side effects. This can also cause a reduction in doses further improving the safety of the drug therapy [2-6].

Monosaccharide and polysaccharide polymers obtained from the natural origin are non-toxic, biocompatible, and biodegradable. Additionally, polysaccharides are more thermally stable than other biopolymers, like lipids and proteins [7]. According to Manandhar S, et al. (2021) [8], incorporation of the drug into a chemically modified polymeric matrix might protect the biologically active compound from improving absorption, degradation; enhance the therapeutic efficacy, control drug release, and so lead to the decrease in the frequency of administration. The monosaccharide, Galactose is an aldohexose that naturally occurs in D-form in lactose and also C4 epimer of glucose [2, 9]. As per the literature [10, 11], the polysaccharide, Pectin's are made of several sugar derivatives, the most significant of which are the rhamnogalacturonan and homogalacturonan locales. They are frequently depicted in worked-on terms as the furry and smooth districts individually. Chitosan the polysaccharide is a molecule having a similar structure to cellulose with a carbohydrate

Formulation and Evaluation of the Cream containing Piper Betle Leaves Extract

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ABSTRACT:

Hyperpigmentation affects people globally with negative psychology impacts. Piper Betle Leaf (PBL) extracts has many benefits including skin lightning which may reduce hyperpigmentation. The objective of this study was to develop an effective skin lightning cream containing PBL with ideal characteristics. A formulation of PBL cream was prepared and physical properties observed. Base and PBL cream had a non-Newtonian property with acceptable color, odor, texture, and showed no phase separation. The developed PBL creams showed significant results in the reduction in melanin content.

KEYWORDS: Hyperpigmentation, Piper Betel leaves, Topical formulation.

INTRODUCTION:

Piper Betel Leaf Extraction

The leaves were freshly dried at a room temperature for 7 days then ground into powder. Cold maceration of PBL was performed by using acetone at a room temperature for 72 hours with the occasional stirring. 100 g of powdered PBL in 500 ml of acetone for 72 hours.

Fig No. 1: Leaves dried at room temperature

Water in Oil Cream Formulation:

Cream development started by placing the ingredients as listed in the table no.-1,2,3, and 4 into two different beakers comprising of aqueous and oil phase which where both heated upto 75°C in a water bath for a 15 mins. Both the mixtures were mixed thoroughly using glass rod. Water phase was then added to oil phase (drop wise with a constant stirring) and homogenized with homogenizer for 10 mins.

The cream formed was left to cool to the room temperature before adding cold phase ingredient. The complete mixture was homogenized once again for 10mins.

Fig no.2-Maceration

Fig no.3-Extract

Introduction:

Hyperpigmentation is a skin disorder that causes area or it may cover a large area of body. This skin disorder is caused by excessive production of melanin by melanocytes of skin epidermis. It can also be caused by active melanocytes proliferating thus increase the number of melanocytes. This overproduction can be caused by an overabundance of sun exposure, hormonal change in pregnancy, certain medications as well as endocrine disease, solar lentigines, melasma, freckles, post-inflammatory hyperpigmentation and any other dark mark on skin are examples of hyperpigmentation, as shown in fig. no.-4.

Fig no.4-Illustration of some common hyperpigmentation issues

Pigmentation on skin is becoming a major aesthetic concern to many people. Some of treatment modalities for hyperpigmentation include topical skin lightning agent, chemical, laser therapies and surgery also.

Based on guidelines, the use of topical skin lightening agents acts as a first line therapy to tackle this matter. The most common skin lightning agent are chemical based such as hydroquinone, arbutin, tretinoin and alpha hydroxyl acids (kojic acid, glycolic acid, lactic acid). All of these agent act by inhibiting activity of tyrosine enzyme, with which in succession leads to reduced production of melanin, hence depigmenting or whitening effect.

However, these agents may cause adverse effect including skin irritation, contact dermatitis, ochronosis, permanent depigmentation and increasing skin's UV sensitivity. This discovery sparked interest in finding alternative skin lightening agents from naturals sources such as plant extracts, with belief that they are safer to use compared with synthetic chemical agents.

The leaf of piper betle leaf has been reported to have many therapeutic benefits including skin lightening effects. Piper betle leaf is a plant native to peninsular Malaysia from piperaceae family with easily obtained from local markets by name "Sirih". The skin lightening effect is believed to be contributed by compound named hydroxyehavicol (1-allyl-3,4- dihydroxy benzene). Researchers have found that its skin lightning effect is mediated through its anti-tyrosine activity in melanin

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Original Research Article

Formulation and evaluation of guava leaf extract gel for mouth ulcer management

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ABSTRACT

Background: The highlight of this study was preparation of microparticles using the extract of guava leaves which led to novel drug delivery of the herbal extract.
Aim: The aim of the study was to formulate a microparticles loaded gel for management of mouth ulcer.
Materials and Methods: The microparticles were prepared by solvent evaporation method using the polymer, oil and liquid phase. Then the preparation of gel base was done with incorporation of microparticles. The evaluation of the microparticles and the gel was done.
Results and Discussion: This study is an effort to develop a herbal gel for mouth ulcers offering better compatibility and lesser discomfort. We used Psidium guajava leaf extract microparticles for the preparation of gel. The gel formulations prepared were transparent and homogeneous within the pH range of 6 to 6.8. The formulation showed acceptable spreadability, extrudability and rheological properties. The formulation showed antibacterial effect against Staphylococcus aureus and E coli. Therefore, developed formulations have the potential to treat mouth ulcers.
Conclusion: The Psidium gujava leaf extract microparticles loaded gel is a good mucoadhesive gel for mouth ulcer management. Therefore, herbal ingredients can be used for novel drug delivery and make it safe for administration with lesser risk of adverse reactions.

1. Introduction

Mouth ulcers are yellowish or white depression with red margination in the mucus lining of the mouth cavity, characterized by inflammation and pain.[1] Synthetic and semi-synthetic medicaments are suggested to treat mouth ulcers like antibiotics and antiseptics, local anesthetics, local analgesics, steroidal and non-steroidal anti-inflammatory drugs. Topical steroids are the most frequently used treatments but they have some serious adverse effects on the continuous application like adrenal insufficiency, immunosuppression, osteoporosis, hyperglycemia, gastrointestinal disturbance, etc.[2] The use of plant-based medications is gaining huge popularity due to better patient compliance and because of the side effects and the adverse effects of synthetic chemicals. Several studies have reported, the use of plant parts or extracts such rhizome of *Curcuma longa* , leaves of *Psidium guajava,* leaves of Piper betel, *Zingiber Officinale,* in the form of mouth wash, paste, or mucoadhesive gels for the treatment of oral ulcers.[3]

Psidium guajava is an evergreen shrub that belongs to the Myrtaceae family.[4] Alkaloids, carotenoids, phenols, Flavonoids are found in this plant especially quercetin is found as the major component. It demonstrated several activities including antibacterial, anti-diarrhoeal, anti-ulcer properties.[5] Guava leaves contain essential oils such as

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OPTIMIZATION OF THERMOREVERSIBLE NASAL GEL OF CARBAMAZEPINE FOR BETTER CONTROL IN CHRONIC EPILEPSY

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Abstract : The aim of present work was to formulate thermosensitive in situ gel of carbamazepine (CBZ), an anti-epileptic agent. In situ nasal gel of CBZ was formulated by cold method using Pluronic F68 and Pluronic F127 as thermoreversible stimuli sensitive polymer along with two different grades of hydroxypropyl methyl cellulose as mucoadhesive polymer. It is thought that the thermo-reversion and mucoadhesion would synergistically enhance the residence time of the drug in the nasal cavity and also impart better penetration of the drug to brain for the site-specific activity. The sustained release obtained from the viscous gel makes the treatment even better especially in the chronic epileptic conditions like tonic-clonic seizures. The prepared formulations were evaluated for pH, clarity, in vitro gelation, gelling strength, mucoadhesion, in vitro drug release and accelerated stability studies. Results have shown that final batches of in situ gels were having desired gelation temperature to provide pourable 'Sol' form at room temperature and 'Gel' form in the nasal cavity with a good gel strength and mucoadhesion required for nasal retention. Formulations showed polymer concentration dependent drug release retardation over a period of 6 hrs.

Index Terms **- Thermoreversible gel, Stimuli-sensitive, HPMC, Pluronic, Carbamazepine, Epilepsy.**

INTRODUCTION

Carbamazepine is an anticonvulsant and/or anti-epileptic drug which also relieves neuropathic pain and also used in case of Schizophrenia. Carbamazepine reduces sodium channel activity by binding with it. Carbamazepine is metabolized by CYP3A4 system in liver.[1] This leads to increase in drug clearance and reduced half-life as well, increasing its frequency of administration.

In case of patients with brain disorders, oral drugs administration is more challenging due to presence of lipophilic tight junctions of blood brain barrier.[2] To avoid these difficulties, bypassing oral route could be better option. Nasal administration of Carbamazepine can lead to efficiency of it, by maintaining drug levels in brain through brain targeted drug delivery.[3]

Drug delivery through nasal route gives better bioavailability and pharmacological action too. Nasal mucosa provides drug absorption at higher levels at faster rate due to higher permeability and low enzymatic environment. As there is direct contact between brain and nasal route, it is preferred route to enhance pharmacological effects of drug.[4, 5]

The present work describes formulation of thermoreversible nasal in situ gel of carbamazepine for better control in chronic epilepsy and evaluation thereof.

MATERIALS AND METHODS;

MATERIALS:

Carbamazepine was obtained from Sun Pharmaceuticals Ltd, Mumbai complying with USP monograph supplied as a gift sample. HPMC (Methanol K4M, K15M, and K100M grades) suitable for use in the present study was supplied by Colorcon, Mumbai. Pluronic was obtained from Noveon Ltd, Mumbai. All other excipients used were of pharmaceutical grade.

PREPARATION OF THERMOREVERSIBLE NASAL IN SITU GEL

The drug-loaded thermoreversible in situ gels were prepared by cold method [6]. The drug was dissolved in sufficient quantity of distilled water. Pluronic F127/ F 68 was added slowly with continuous stirring. The dispersions were refrigerated at 8°C until clear solution was obtained and finally volume was adjusted. Optimization was done by varying the polymer concentrations for gelation temperature. Batch containing optimized concentration was used for preparation of mucoadhesive gel. The final combinations are depicted in Table 1.

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Research Article

Preparation, Evaluation & Comparison of Herbal Mouthwash agains Micro-Organisms

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Abstract

Medicinal plants plays vital role in curing diseases due to their antimicrobial activity against human pathogens through decades. Herbal mouthwashes are in high demand, because they act on oral pathogens and relive the pain instantly and are also less side effective. One of the most common infectious diseases encountered by many individuals is dental carries and periodontal diseases at different stages of their life time. Dental carries include the cavity formation, eruption of enamel, swollen gums, bleeding gums. Dental carries are high among children and adolescents, because they do not practice proper oral hygiene. Prepared antimicrobial Herbal Mouthwash from the solvent extract of five different herbs like Naie, Guava, Pomegranate, Dikmali and Henna that acts against the oral pathogens namely *S.aureus. S. pyrogen. E. coli* and *C. albicans* to check the antimicrobial activity by using Disc Diffusion method. The prepared Herbal Mouthwash had shown the antimicrobial activity against used test microorganisms.

Keywords: Herbal; Extraction; Micro-organisms; Mouthwash

Introduction

The mouth washes are concentrated aqueous anti-bacterial solutions that are used against oral microbes to counter oral infection, cleansing, to get rid of bad breath refreshing, antiseptic. The mouthwash plays an prominent role in the oral hygiene of an individual, it helps to relieve symptoms of inflamed gums gingivitis. And also it reliably used to destruct the pathogenic germs. The mouth washes are used by most of the dental patients to overcome sour mouth i.e. xerostomia, ulcerated throat and sensitive teeth. Dentists always use mouthwash as an antimicrobial agent before oral surgery of the patients, because they help to sterilize the surface of the inflamed gums and teeth, thereby the contamination of any other microorganisms can be avoided. Ancient Egyptians are known to be responsible for the first artistic drawings that emphasize the importance of beauty and hygiene. An unclean body was thought to be impure. PedaniusDioscorides, a Greek physician and surgeon (40–90 AD) whose writings served as a medical textbook, suggested for treatment of bad breath a mouthwash mixture of the following: a decoct of the leaves of the olivetree, milk, the juice of pickled olives, gum myrrh with wine and oil, pomegranate peelings, nutgalls, and vinegar. The ancient Romans included teeth cleaning as part of their [1-9] religious ceremonies. The patriarchy required their slaves to clean their teeth. The Romans included a secret ingredient in their mouthwash: human urine. They imported urine from Portuguese people because they thought it had more strength. Until the 18th century, urine continued to be an active ingredient in toothpaste and mouthwash because of the ammonia's cleansing abilities.

1. **Mouthwashes can be broadly classified as**

a. **Chemical mouthwashes**

b. **Herbal mouthwashes**

a. **Chemical mouthwashes**

Usuallycontainsantimicrobialagents,suchaschlorhexidinegluconate which is very potent chemoprophylacticagent, it has abroad spectrum action especially against Mutans Streptococci group. But it has many

The importance of herbs is highly considered as effectiv to chemical products. Medicinal plants, plays vital rol diseases due to their antimicrobial and antifungal acti human pathogens through decades. Herbs are being wid to discover alternatives to syntheticantibacterial age Mouthwash act on oral pathogens and relives pain insta also less side-effective.

a. **Uses of mouthwash**

1. Antiseptic/As antibacterial
2. Astringent
3. Cooling and refreshing action

b. **Aim and objectives**

- To prepare Herbal Mouthwash.
- To evaluate prepared Herbal Mouthwash.
- To compare the prepared Herbal Mouthwash wi Chemical Mouthwash.

Details of Selected Herbal Plant

Material and Method

Collection of herbal plant materials

Herbal plant materials like Guavawas collected locally Solapur city and remaining herbs like Naie, Dikmali, (Table 1) I

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FORMULATION AND EVALUATION OF MOUTH DISSOLVING BUCCAL FILMS OF BILASTINE

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ABSTRACT

Oral mouth dissolving film of Bilastine was prepared with the solvent casting method using synthetic polymer and PEG400 as a plasticizer. The prepared films were then evaluated for the various evaluation parameters such as physical appearance, thickness, folding endurance, in vitro disintegration, mechanical properties, surface pH, drug content uniformity, taste evaluation, in vitro dissolution test. The F6 formulation was found to be optimized and appropriate in its evaluation parameters than compared to other formulation. Mouth dissoloving film Bilastine showed folding endurance test 152-170, disintegration time 29-35sec, thickness 0.39-0.47mm, the % elongation 10.7-26.8, the maximum % drug release 98.36% in 30mins, drug content 97-98.41% and surface pH of 6.4-6.6. Mouth dissolving films of Bilastine can be considered suitable for the treatment of symptoms of allergies and where a quicker onset of action for a dosage form is desirable along with the convenience of administration.

KEYWORDS: Mouth dissolving film, Bilastine, Synthetic Polymer, Solvent casting.

INTRODUCTION

The present article focuses on the buccoadhesive drug delivery systems/ fast dissolving film depend on binding to biological surfaces that are covered by mucus. Nowadays, growing demand for patient convenience and compliance related research. Also novel method is the development of buccal films, which dissolve on the patient buccal mucosa. This drug delivery system is suitable for the drugs which passes through high first pass metabolism and is used for enhancing bioavailability with reducing dosing frequency to mouth plasma peak levels, which in turn minimize adverse side effects. It is also make cost effective and effective in geriatric and pediatric patients. In addition, films have improved patient

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UV SPECTROPHOTOMETRIC METHOD DEVELOPMENT AND VALIDATION FOR ESTIMATION OF DASATINIB IN BULK AND TABLET DOSAGE FORM

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ABSTRACT

The aim of present work is to develop a simple, accurate, precise, rapid, economical UV Spectrophotometric method for the estimation of Dasatinib in bulk and tablet dosage form. **Method:** Spiked Dasatinib arrangement was checked over UV- visible extend for its absorbance maxima. **Results:** The absorbance maximum was determined at 232 nm using 0.1% formic acid as a solvent. The relationship coefficient over the concentration extend of 40-60 µg/ml was found 0.9995. The LOD and LOQ of Dasatinib were found 0.687445 and 2.083166 respectively. The method was successfully applied to Dasatinib in marketed formulation and results were in good agreement with label claims. **Conclusion:** Depending on the results, the given method can be successfully applied for the assay of Dasatinib in various tablet dosage form.

KEYWORDS: Dasatinib, 0.1% Formic Acid, Absorbance Maxima, UV –Visible Spectrophotometer, Method development & validation.

INTRODUCTION

Dasatinib is an anti-cancer drug. Chemical formula of dasatinib is $C_{22}H_{26}ClN_7O_2S$ and having molecular weight of 488.005gm/mol.[1] IUPAC name of Dasatinib *N*-(2-chloro-6-methylphenyl)-2-[[6-[4-(2-hydroxyethyl)-1-piperazinyl]-2-methyl-4-pyrimidinyl]amino]-5-thiazole carboxamide monohydrate.

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Current Trends in Pharmacy and Pharmaceutical Chemistry

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Original Research Article

Formulation and evaluation of posaconazole loaded nanostructured lipid carriers for topical drug delivery system

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ABSTRACT

The aim of the present study was to formulate and evaluate Posaconazole loaded NLCs gel using solid lipid as GMS, liquid lipid as oleic acid and surfactants as tween 80 and span 80, with the help of high-speed homogenization followed by sonication technique to improve the bioavailability, to avoid the oral side effects, to achieve the site-specific delivery and to improve the patient compliance. NLCs of Posaconazole was prepared with different drug: carrier ratios using high speed homogenization followed by sonication technique. % entrapment efficiency for F3 batch of NLC was found to be more than 95%. SEM studies were carried out and depending on it F3 batch was found to have particle size range 200nm which was selected as optimized NLCs batch. IR, XRD and DSC were performed to identify the physicochemical interaction between drug and optimized formulation. The optimized NLCs was then incorporated into gel base to form Posaconazole loaded NLCs gel. The prepared NLCs gel were evaluated for viscosity, pH, spread-ability, extrudability and in-vitro drug release studies. It was found to be 34666 cps, 5.7, 12.22 ±0.8 cm, 85.34% and drug release of NLCs gel was 6 hrs was 98.62% respectively. The obtained data for in-vitro drug release was putted in various mathematical kinetic models. Hence, F3 batch was selected as optimized batch.

1. Introduction

Currently, a large number of new therapeutic compounds are being produced, however chemical screening has revealed roughly 40% of new drug candidates as having low water solubility and bioavailability.[1,2] It is necessary to create drug delivery systems that address these issues. Lipid nanoparticles (SLN) and nanostructured lipid carriers are alternatives to emulsions, liposomes, and polymeric micro particulate systems.[3,4]

Nanostructured lipid carriers are a novel colloidal system that consists of submicron particles that are spherical in shape and have an average diameter of 50-500 nm. Physical stability, bioavailability, biocompatibility, and controlled drug release are just a few of the advantages they offer as a drug delivery vehicle.[5–10] Nanostructured lipid carriers are a promising system in many applications due to their adaptability.

Nanocarriers have been utilized to deliver drugs for a long time. A number of polymeric nanoparticles have been developed for use in a variety of medications. However, despite substantial study, polymeric nanoparticle-based solutions have yet to gain traction in the marketplace due to a lack of pilot plant scale-up methodologies.[12–15] To address this issue, solid lipid nanoparticles (Solid Lipid Nanoparticles) were developed. Solid Lipid Nanoparticles has several advantages over polymeric nanoparticles, including biodegradability, biocompatibility, and large-

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FORMULATION AND CHARACTERIZATION OF CARBAMAZEPINE NANOCRYSTALS BY ANTISOLVENT PRECIPITATION METHOD

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ABSTRACT

Nanocrystals of any drug are pure solid drug particles with a mean diameter in nanometer range. The aim of this study was to develop nanocrystals of a hydrophobic drug. carbamazepine, by addition of solvent to an antisolvent to achieve solubility enhancement. The developed nanocrystals were characterized for particle size, solubility, solid nanocrystals were characterized for DSC and XRD. These are considerable increase was found in the solubility of the nanocrystals as compared to pure drug. The nanocrystal development by antisolvent precipitation procedure using ethanol as solvent, water as antisolvent, it's a very promising and effective method to increase the dissolution rate of carbamazepine.

KEYWORDS-*Carbamazepine, Nanocrystals, Antisolvent Precipitation Method.*

INTRODUCTION

A nanocrystal is a material particle having at least one dimension smaller than 100 nanometers, based on quantum dots (a nano-particle) and composed of atoms in either a single or poly-crystalline arrangement. When embedded in solids nanocrystals behavior than conventional solids and may form the basis of a special class of solids They can behave as single-domain system (a volume within the system having the throughout) that can help explain the behavior of microscopic amples of a similar material without the complicating presence of grain boundaries and other defects. Semiconductor nanocrystals having dimension smaller than 10 nm are also described as quantum dots. (1) Nanocrystals and their composites can exhibit markedly different properties with respect to bulk phases and hence offer new opportunities. For pharmaceuticals, nanocrystals promise to resolve the issue of poor bioavailability of poorly soluble drugs. The immense surface area of the particles, increased saturation solubility, and the decreased diffusional pathway adjacent to the nanocrystal surface all converge to enhance the bioavailability. The difficulty in exploiting this technology is the technical challenge of generating and stabilizing nanocrystalline products.

Nanocrystals can be prepared by a variety of methods, which in general terms can be categorized as comminution (top down) or controlled precipitation (bottom up). Although the technology is maturing, there are still important issues and limitations. Top-down processes which include milling and high-pressure homogenization usually require long processing times, high energy input, and tend to yield a broad particle size distribution. There is also a concern with regards to contamination of the products from the milling media[2]. With respect to precipitation methods, there are many variants including simple precipitation, spray freezing into a liquid precipitation from a supercritical fluid using an antisolvent, and microfluidics. Precipitation has also been employed in combination with homogenization. The major limitations with precipitation are considered to be uncontrolled particle growth which has resulted in its adoption for only a few selected molecules.[3] Carbamazepine (CBZ) is a class II antiepileptic drug and has high intestinal permeability. But the bioavailability of CBZ is limited because of its low solubility in water. CBZ exists in at least four anhydrous forms: primitive monoclinic (III), C-cantered monoclinic (IV), trigonal (II), and triclinic (I). Among these, form III is the most stable polymorph under ambient conditions. Herein, we describe a Precipitation technique followed by annealing to produce nanocrystals of CBZ with the most stable form III for continuous pharmaceutical manufacturing. The effects of the solution properties and operating parameters on the morphology, crystallinity, and polymorphism of CBZ nanocrystals are described. The solubility and dissolution rates of the nanocrystals are also reported. (2)

MATERIALS AND METHODS

Material-Carbamazepine, Ethanol, phosphate buffer 6.8 and 7.4, Distilled water.

Method of Preparation of Carbamazepine Nanocrystals

The Nanocrystal of Carbamazepine were prepared using precipitation technique. A known quality of carbamazepine was completely dissolved in solvent (ethanol) which was

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RESEARCH ARTICLE

Development and Validation of RP-HPLC method for the Estimation of Ritonavir in API and tablet Formulation

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ABSTRACT:
A Reverse Phase High Performance Liquid Chromatographic method has been developed and validated for estimation of Ritonavir in API and Tablet formulation. The chromatographic separation was carried out using ZOROBAX Bonus-RP C-18 column (250 x 4.6mm, 5µm) as stationary phase and Methanol: Acetonitrile: 0.1% Trifluoroacetic acid water (81:9:10) as mobile phase at 1.0 ml/min flow rate and detection was carried out at 250 nm. The method was validated accordance to the Guidelines of International Council for Harmonization (ICH). Ritonavir have linearity in the concentration range of 50-150µg/ml with correlation coefficient (r^2=1) respectively. Ritonavir eluted at 3.05 min respectively. The method is sensitive, precise and accurate. So, the method can be successfully applied for the routine analysis of Ritonavir in pharmaceutical formulations.

KEYWORDS: Ritonavir, RP-HPLC, Method development, Validation, 250nm and Diode Array Detector.

1.0. INTRODUCTION:
The chemical name of Ritonavir is (5S, 8S, 10S, 11S) - 10- hydroxy- 2-methyl- 5- (1- methylethyl) - 1- [2- (1-methylethyl) - 4- thiazolyl] -3, 6-dioxo- 8, 11- bis (phenylmethyl)-2, 4, 7, 12- etraazatridecan- 13-oic acid 5-thiazolyl methyl ester. It is official in Indian Pharmacopoeia[1] and United States Pharmacopoeia.[2] It has the Molecular Formula is $C_{37}H_{48}N_6O_5S_2$, Molecular Weight is 720.948 g/mol and structural formula shown in (Fig. 1).

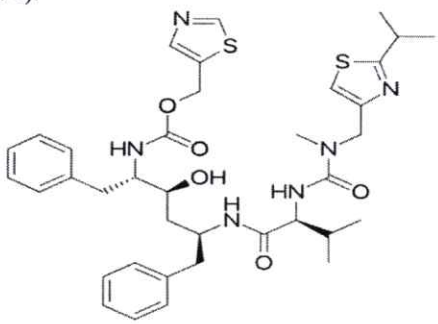

Fig. 1: Structure of Ritonavir

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Ritonavir[3] is an antiretroviral drug from the protease inhibitor class used to treat HIV infection and AIDS. Ritonavir is frequently prescribed with Highly Active Anti-Retroviral Therapy, not for its antiretroviral action, but as it inhibits the same host enzyme that metabolizes other protease inhibitors. This inhibition leads to higher plasma concentrations of these latter drugs, allowing the clinician to lower their dose and frequency and improving their clinical efficacy. From the literature survey, it was found that Ritonavir estimated by analytical methods such as RP-HPLC method[4, 5, 6, 7, 8, 9, 10,16], UV[11-14] Spectroscopic LC-MS[15] and HPTLC method.[17] The developed method was simple, precise, specific and accurate. The statistical analysis proved that method is reproducible and selective for the analysis of Ritonavir in API and tablet formulations.

2.0 MATERIAL AND METHOD:
2.1 Chemicals and reagents
The drug Ritonavir was obtained as gift sample from Aadhar Life Sciences. HPLC grade Methanol, Acetonitrile, 0.1% Trifluoroacetic acid water Merck Specialities Pvt. Ltd., Mumbai, India.

2.2 Instruments:
Analytical balance (Aczet CY224C), HPLC (Agilent 1260 Infinity II autosampler), Diode Array Detector (G4212B), UV-VIS Double Beam Spectrophotometer

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RESEARCH ARTICLE

UV Spectrophotometric Method Development and Validation of Darunavir in bulk and Solid Dosage Form

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ABSTRACT:

Objective: A new, simple, sensitive, precise, reproducible UV visible spectrophotometric method was developed for the determination of Darunavir in Tablet dosage form with 0.1N HCl. **Method:** The method is based on the formation of a colorless complex. The UV spectrum of Darunavir in 0.1N HCl showed maximum wavelength at 298nm. Beer's law is valid in the concentration range of 10-60µg/ml. this method was validated for linearity, accuracy, precision, assay, ruggedness and robustness. **Results:** The method has demonstrated excellent linearity over the range of 10-60µg/ml with the regression equation y=0.0113x+0.0098, and regression coefficient i.e. r^2=0.9992 moreover, the method was found to be highly sensitive with LOD (1.85µg/ml) and LOQ (5.62µg/ml). **Conclusion:** Based on the results the proposed method can be successfully applied for the assay of Darunavir in various tablet dosage forms.

KEYWORDS: Darunavir, UV visible spectrophotometer, 0.1N HCl, method development and validation.

INTRODUCTION:

Darunavir is a protease inhibitor used with other HIV protease inhibitor drugs as well as ritonavir for the effective management of HIV-1 infection. As a second-generation protease inhibitor, darunavir is designed to combat resistance to standard HIV therapy. It was initially approved by the FDA in 2006. Darunavir is being studied as a possible treatment for SARS-CoV-2, the coronavirus responsible for COVID-19, due to in vitro evidence supporting its ability to combat this infection. Clinical trials are underway and are expected to conclude in August 2020.[1-2]

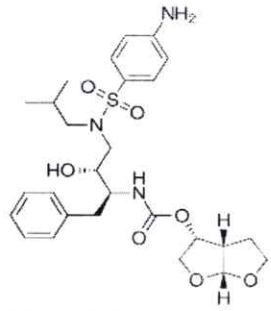

Figure1: Structure of Darunavir

The IUPAC name of Darunavir is (3R,3aS,6aR)-hexahydrofuro [2,3-b] furan-3-yl N-[(2S,3R)-3-hydroxy-4-[N-(2-methylpropyl)4-aminobenzenesulfonamido]-1-phenylbutan-2-yl]carbamate and chemical formula is $C_{27}H_{37}N_3O_7S$. The molecular weight of Darunavir is 547.23gm/mol. Darunavir is Soluble in pH 7.4, ethanol, methanol, DMSO, DMF, 0.1N HCl.[3]

MATERIALS AND METHODS:

Instruments Used:

UV-visible Spectrophotometry (Systronic 2201), 1cm quartz cuvette were used for the measurement of absorbance, Weighing Balance (Shimadzu AY220), Sonicator (Oscar Ultrasonicator microclean-103).

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RESEARCH ARTICLE

UV Spectrophotometric Analysis and Validation of Dapsone in Semisolid Dosage Form

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ABSTRACT:

Objectives: A new, economical, sensitive, simple, rapid UV spectrophotometric method has been developed for the estimation of Dapsone in pure form and Semisolid Dosage form. **Method:** This UV method was developed using methanol: RO water (75:25) as a solvent. In the present method the wavelength selected for analysis was 260nm. UV-Visible double beam spectrophotometer (Systronic 2201) was used to carry out spectral analysis. The ICH guidelines were used to validate the method. **Results:** The method was validated for linearity, range, accuracy, precision, robustness, LOD and LOQ. Linearity was found in the range of 3-18µg/ml. Accuracy was performed by using recovery study. The amount of drug recovered was found to be in the range of 100.1-100.5 %. The %RSD value was found to be less than 2. **Conclusion:** The proposed UV spectroscopic method was found to be accurate, precise, stable, linear, specific, and simple for quantitative estimation of Dapsone in bulk and Semisolid dosage form. Hence the present UV spectroscopic method is suitable for routine assay of Dapsone in bulk and Semisolid dosage form.

KEYWORDS: Dapsone, UV-Visible spectrophotometric method, Method validation.

INTRODUCTION:

One of the most frequently employed techniques in pharmaceutical analysis is UV-Visible spectrophotometry. The amount of ultraviolet or visible radiation absorbed by a substance in a solution is measured by UV spectrophotometer[1].

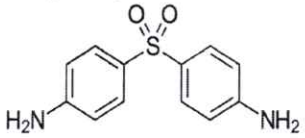

Figure 1: Chemical structure of Dapsone

Dapsone used as a medication to treat leprosy and skin infection. Solubility of Dapsone is in Methanol, Ethanol, DMF, DMSO etc. Dapsone, also known as diaphenylsulfone or dadps, belongs to the class of organic compounds known as benzenesulfonyl compounds. These are aromatic compounds containing a benzenesulfonyl group, which consists of a monocyclic benzene moiety that carries a sulfonyl group[1-5].

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MATERIALS AND METHODS:

Instruments:

UV/Visible double beam spectrophotometer Systronic 2201. Standard cuvettes having 10mm of path length are used for analysis. Ultrasonicator (microclean-103) was used to sonicate the formulation sample. Drug sample was weighed by using electronic analytical balance (Shimadzu AY220).

Chemicals and reagents:

Active pharmaceutical ingredient of Dapsone is gifted as a sample from Aadhaar Life Sciences Pvt. Ltd. Solapur. Marketed formulation of Dapsone was procured from local pharmacy.

EXPERIMENTAL:

Method Development:

Preparation of standard stock solution of Dapsone:

10mg of standard drug Dapsone was accurately weighed and transferred into 10ml volumetric flask and sufficient amount of methanol: ROWater (75:25) was added into it and sonicated for 15 minutes, finally volume was made up to the mark with the same solvent to make 1000µg/ml stock solution. From this 1ml was again diluted to 10ml to get a concentration of 100µg/ml of Dapsone. From

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REVIEW ON REVERSE PHARMACOLOGY

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ABSTRACT

Traditional medicines emerged as a boon for the populations with strong socio-cultural and historical influences or in the absence of alternative or complementary therapies. Ayurveda, an Indian system of medicine, built remarkable knowledge over the practice of several thousands of years. This gold mine of clinical observations is attracting global pharmaceutical corporations to fuel their investigational drug pipelines. (1)

Reverse pharmacology (RP) is a trans-disciplinary path for drug discovery and development from bedside observations on drug effects to bench-side experiments. This approach generates evidence of safety and efficacy at different levels of biological organization, ranging from cell to community. Eventually the innovative integration of research methods will be translated back to the bedside as a new drug. The experiential wisdom of traditional systems like Ayurveda is scientifically explored by systematic RP. This is meant to enrich modern medicine, by the relevant application of the drug discovery sciences. The evidence by RP would also help to rationally understand Ayurveda. This article highlights how the bedside experience in arthritis has been translated by RP into evidence by defined experimental and clinical studies. There is a need to understand and apply the basic principles and practices of Ayurveda in the specific protocols and models in RP so as to truly integrate effective and safe usage for definite indications. (2)

Keywords: Ayurveda, Traditional medicines, repurposing drug, reverse pharmacology.

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RESEARCH ARTICLE

Simultaneous HPLC Method Development and Validation of Bilastine and Montelukast in Bulk and Formulation

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ABSTRACT:
A new, simple, rapid, selective, precise and accurate reverse phase high performance liquid chromatography assay has been developed for simultaneous estimation of Bilastine and Montelukast in tablet formulations. The separation was achieved by using Phenomenax Kinetex XB C-18 column (150 x 4.6mm, 5μ.) using mobile phase Methanol: 0.1% TFA water (80:20). Injection volume was 10µl. The flow rate was 1.0mL.min^{-1} and the separated drugs were detected using UV detector at the wavelength of 270nm. The retention time of Bilastine and Montelukast was noted to be 1.27, and 4.86 respectively, indicative of rather shorter analysis time. The method was validated as per ICH guidelines. The proposed method was found to be accurate, reproducible, and consistent. It was successfully applied for the analysis of these drugs in marketed formulations and could be effectively used for the routine analysis of formulations containing any one of the above drugs, or a combination, without any alteration in the chromatographic conditions.

KEYWORDS: Liquid Chromatography; Bilastine, Montelukast; Combined dosage forms; Simultaneous estimation.

INTRODUCTION:

Bilastine or 2-[4-[2-[4-[1-(2-ethoxyethyl) benzimidazol-2-yl]piperidin-1-yl]ethyl]phenyl]-2-methylpropionic acid, is selective Histamine H1 receptor antagonist, leading to decreased nasal congestionand urticaria. It reduces the development of allergic symptoms by binding to and preventing activation of the H1 receptor. It is used for management of seasonal rhinitis andspontaneous urticaria.[1-6]

Montelukast sodium [R-(E)}-1-[[[1-[3-[2-(7-Chloro-2 quinolinyl) ethynl] phenyl]-3-[2-(1-hydroxy-1-methylethyl) phenyl] propyl]thio]methyl] cyclopropaneactic acid, monosodium salt is a Cysteinylleukotriene 1(CysLT1) receptor antagonist. It is used for management of asthma, exercise induced bronchoconstrucionand allergic rhinitis. It works by blocking the action of leukotrine D4 in the lungs resulting in decreased inflammation and relaxation of smooth muscle.[7-10]

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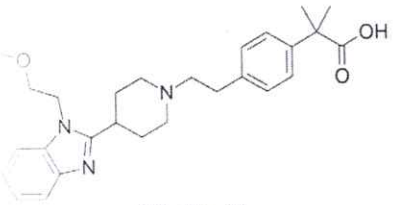
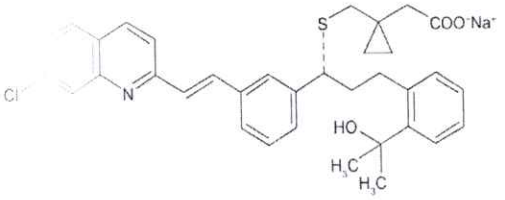
The structures of these two drugs are shown in Fig. 1.



Bilastine (I)



Montelukast (II)

Fig.1.The structures of Bilastine and Montelukast

Reverse phase high performance liquid chromatography (RP-HPLC) method for single drug Bilastine and Montelukast sodium are reported[1,7-10]. However no HPLC method for simultaneous estimation of these two drugs has been reported in combine dosage form till date[11-12]. In the present study, an attempt has been made to develop a method for the simultaneous estimation of

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In silico design and pharmacological evaluation of conjugates of atenolol with modified saccharide for cardiovascular targeting

Smita Tukaram Kumbhar, Shitalkumar Shivgonda Patil & Manish Sudesh Bhatia

Glycoconjugate Journal **38**, 261–271 (2021)

Abstract

Amongst a wide range of biological macromolecules, saccharides exhibit the potential to be specifically recognized by cell-surface receptors and hence can be utilized as ligands in targeted drug delivery. The current study aims to use saccharides viz. Galactose, Pectin and Chitosan to improve targeting of Atenolol by oxalyl chloride mediated grafting. Conjugates were engineered by grafting Atenolol, a cardiovascular agent with the modified saccharide units. The conjugates were characterized by FTIR, DSC and ^{1}H NMR study. Drug release analysis and cellular uptake study was carried out using H9c2 cell lines which represent that concentration of drug in cells treated with all atenolol-saccharide conjugates is enhanced by

REVIEW ARTICLE

A REVIEW ON BASICS AND APPLICATIONS OF MODIFIED CARBOHYDRATES IN DRUG DELIVERY

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(Received 09 October 2019) (Accepted 24 February 2020)

ABSTRACT

Polysaccharides demonstrate a wide diversity in their structural features as well as physicochemical properties owing to a variety of functional groups, chemical structure and a broad array of molecular mass. The most important feature of modified polysaccharides is their amphiphilic character which allows the application of these conjugates as an emulsifier, modifiers of surface in liposomes and micro/ nanoparticles, viscosity modifiers and drug delivery vehicles. Recently, the lipophilic modification of polysaccharides, which serve as a nano-container for water-insoluble or poorly water-soluble drugs, has gained attention in the biomedical applications due to their ability to form self-assembled nanoparticles. The natural polysaccharides are readily available, stable, biodegradable, economical, safe and biocompatible. It is difficult to synthesize compounds with such diversity in characteristics. In recent decades, many researchers have taken interest in polysaccharides and their derivatives for use in nanoparticulate systems. This review focuses on the chemical modification of mono and polysaccharides and the mechanisms involved in the formation of polysaccharide-based nanoparticles.

Keywords: Chitosan, Galactose, Pectin, Polysaccharide, Targeted drug delivery system

INTRODUCTION

Carbohydrates

Carbohydrates are known as polyhydroxy aldehydes or polyhydroxy ketones and classified as mono-saccharides, disaccharides, and polysaccharides held together by glycosidic bonds. Carbohydrates are sources of energy. They also serve as structural constituents in the living creatures[1,2].

Carbohydrates are a complex group of natural products they can be broadly classified as simple carbohydrates (monosaccharides, disaccharides, trisaccharides, and tetrasaccharides), polysaccharides (glucans, fructosans, galactans, pentosans), mucopolysaccharides (natural mucopolysaccharides, simple acid mucopolysaccharides, sulfomucopolysaccharides) and complex carbohydrates (glycosides, glycoprotein, glycolipids, nucleotides, nucleic acid)[3].

Targeted Drug Delivery System

The drug is directly released in the systemic circulation from the traditional drug delivery systems leading to the drug distribution to the entire body[4]. The non-specific drug distribution causes lesser concentration of active medicament at the site of action, resulting in poor pharmacological response, as well as the presence of drug at the other sites, resulting in the unwanted adverse effects of the drug[5,6]. Paul Ehrlich[7] proposed the magic bullet concept which was the earliest form of today's concept of targeted drug delivery system (TDDS). Such system directs the drug to the desired pharmacological target at the concentration in the therapeutic range with the concomitant constraint of its distribution to the normal cells and tissues. Major purposes of the drug targeting are for example, prolonging the drug action[8] if required, localization of active pharmaceutical ingredient in a site-specific manner for improved drug interaction with the diseased cells[9]. Thus, drug targeting improves therapeutic efficacy while minimizing the adverse effects. The targeted delivery system may also cause a reduction in the dose, dosing frequency and fluctuation index. The factors

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NVEO
Natural Volatiles & Essential Oils

Engineered Modified Galactose, Pectin and Chitosan-Metoprolol Conjugates to Target Cardiovascular System

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Abstract

Targeted drug delivery to selective cell has emerged as one of the most significant areas of biomedical engineering research today. Therapeutic efficacy of a drug can be enhanced and optimized by localizing strictly it to a pathophysiologically relevant tissue system. The current study is aimed to develop the saccharide conjugates for targeted delivery of Metoprolol, a β-blocker. The selected saccharides viz. galactose (monosaccharide), pectin (polysaccharide), and chitosan (polysaccharide). The conjugates were engineered by grafting Metoprolol with the modified saccharides. The chemically modified saccharides conjugates were characterized by spectroscopic and thermal analysis. Drug release analysis and cellular uptake study was carried out using H9c2 cell lines. Brine shrimp lethality bioassay was carried out to investigate the cytotoxicity. The results demonstrate that Metoprolol-modified saccharide conjugates can efficiently deliver the drug to the target. It can be concluded that the development of saccharide-drug conjugates can be an effective approach for the targeting of cardiovascular drug.

Keywords – Biopolymer, Chemical modification, Metoprolol, Targeting

I. INTRODUCTION

The ability to specifically target a drug to specific cells has the potential to significantly improve their therapeutic efficacy. Delivery of adequate doses of drug to specific sites promotes its therapeutic outcome wherever required and thus limits its side effects. Thus potentially results in a significant decrease of side effects[1, 2]. According to Martinez[3], the drug targeting concept is often associated with the use of carrier systems, which are potentially able to transport drugs, imaging agents or therapeutic genes selectively to the site of action.

Oligosaccharide and polysaccharide polymers obtained from natural origin are non-toxic, biocompatible and biodegradable. Additionally polysaccharides are more thermally stable than other biopolymers, like lipid and proteins[4, 5]. According to Sabyasachi[6], incorporation of the therapeutic agent into a chemically modified polymeric matrix, might protect the biologically active compound from degradation, improve absorption, control drug release, enhance the therapeutic efficacy, and so leads to the decrease in the frequency of administration. Chemical grafting is a process by which one or more species of blocks are

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Development and Validation of RP-HPLC Method for the Estimation of Acyclovir in API and Tablet Formulation

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ABSTRACT:
The analytical method was developed and validated for determination of acyclovir in Tablet by High performance liquid chromatography. The separation was carried out on Luna C_{18} column (150*4.6mm, 5µm). The mobile phase consists of methanol: water in the ratio 50:50 at flow rate 1ml/min with diode array detector wavelength at 248nm. The column temperature was adjusted at 38° ± 0.8°C with injection volume 20µl. The retention time of acyclovir was 2.718min. The linearity of the calibration curve was linear over the concentration range 40-60µg/ml (r^2=1). The validation was carried out as per ICH guidelines. The development method was easy, rapid, linear, precise, accurate and consistent.

KEYWORDS: Acyclovir, RP-HPLC, Validation, Method development, 248nm and Diode array Detector.

1. INTRODUCTION:

Chemical formula of Acyclovir is [2-amino-9(2-hydroxyethoxy) methyl)-1, 9 dihydro-6Hpurine-6-one]. Acyclovir is an antiviral agent. Acyclovir is a white crystalline powder. Acyclovir is sparingly soluble in water freely soluble in dimethyl sulfoxide (DMSO) and very slightly soluble in alcohol[1-4].

Figure 1: Structure of Acyclovir

Acyclovir is used to control the symptoms of infection involving herpes simplex virus (HSV) type-1 and type-2 which causes herpes simplex, varicella zoster virus (VZV) causes shingles and chickenpox. Acyclovir also known as acycloguanosine, antiviral drug which is used to control the symptoms of infection involving herpes simplex virus (HSV) type-1 and type-2 which causes herpes simplex, or varicella zoster virus (VZV) causes shingles and chickenpox[6-8].

2. MATERIAL AND METHOD:

2.1 Chemicals and reagents:

The drug Acyclovir was obtained as gift sample from Aadhar Life Sciences. HPLC grade Methanol and water (Merck) Mumbai, India. 0.45µm Millipore syringe filters (Ultipor®N_{66}®Nylon 6, 6 Membrane) were from Pall Life Sciences, India.

2.2 Instruments:

Analytical balance (Aczet CY224C), HPLC (Agilent 1260 Infinity II autosampler), Vortex machine (Remi CM 101 plus), Sonicator (Labman).

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REVIEW

Traditional Medicinal Plants Conferring Protection Against Ovalbumin-Induced Asthma in Experimental Animals: A Review

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Abstract: Asthma is a chronic inflammatory disease of the respiratory tract in which the numerous immune cells, including eosinophils, neutrophils, macrophages, T-lymphocytes, mast cells and epithelial lining play key roles. The numerous anti-asthmatic drugs are available in modern medicine to treat asthma, but they have several disadvantages, including side effects and the cost variations, which compromise treatment compliance. The literature review reveals that traditional herbal medicines have good potential as alternative treatment and management for asthma. However, communities hesitated to use the traditional herbal medicines due to lack of established mechanism of action about their anti-asthmatic potential. The present review aimed to summarise the information stated in the literature about the potential effect of traditional medicinal plants (TMPs) conferring protection against ovalbumin (OVA)-induced asthma model. The literature search was conducted in database like PubMed, Scopus, Google Scholar and ScienceDirect. After screening through the literature from 2011 to date, a total of 27 medicinal plants and two polyherbal extracts have been reported to be used as traditional herbal medicines and also utilised to be tested against OVA-induced asthma, were included. We found them to be an important alternative source of treatment for asthma, since some have comparable efficacies with drugs commonly used in the modern system against asthma. All the reported medicinal plants confirmed their traditional use against asthma or its related inflammation. The present review provides faith in traditional information and also offers new insight into the potential of natural products against asthma.

Keywords: OVA-induced asthma, traditional medicinal plants, natural products, allergic asthma, inflammation, T-helper cells

Introduction

Asthma, one of the chronic inflammatory airway diseases, which affecting 300 million people worldwide and is expected to be nearly 400 million by the next 5 years. The incidence of asthma is high and accounting for 1 out of 250 deaths worldwide.[1] Majority of the asthma treatment (as recommended by the Global Initiative for Asthma), target to reduce the symptoms via ameliorating the inflammatory processes.[2,3] To date, current asthma therapies are mainly based on pulmonary, followed by oral or intravenous administrations. The drugs of choice include beta-adrenoceptor-2 ($\beta 2$) agonists, corticosteroids as well as xanthines and their derivatives. For symptomatic relief from asthma $\beta 2$ agonists are often the drugs of choice.[3,4] Nevertheless, given the wide choices of available anti-asthmatic

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REVIEW

Chemistry, Pharmacology and Therapeutic Potential of Swertiamarin – A Promising Natural Lead for New Drug Discovery and Development

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Abstract: Swertiamarin, a seco-iridoid glycoside, is mainly found in *Enicostemma littorale* Blume (*E. littorale*) and exhibits therapeutic activities for various diseases. The present study aimed to provide a review of swertiamarin in terms of its phytochemistry, physicochemical properties, biosynthesis, pharmacology and therapeutic potential. Relevant literature was collected from several scientific databases, including PubMed, ScienceDirect, Scopus and Google Scholar, between 1990 and the present. This review included the distribution of swertiamarin in medicinal plants and its isolation, characterization, physicochemical properties and possible biosynthetic pathways. A comprehensive summary of the pharmacological activities, therapeutic potential and metabolic pathways of swertiamarin was also included after careful screening and tabulation. Based on the reported evidence, swertiamarin meets all five of Lipinski's rules for drug-like properties. Thereafter, the physicochemical properties of swertiamarin were detailed and analyzed. A simple and rapid method for isolating swertiamarin from *E. littorale* has been described. The present review proposed that swertiamarin may be biosynthesized by the mevalonate or nonmevalonate pathways, followed by the seco-iridoid pathway. It has also been found that swertiamarin is a potent compound with diverse pharmacological activities, including hepatoprotective, analgesic, anti-inflammatory, antiarthritis, antidiabetic, antioxidant, neuroprotective and gastroprotective activities. The anticancer activity of swertiamarin against different cancer cell lines has been recently reported. The underlying mechanisms of all these pharmacological effects are diverse and seem to involve the regulation of different molecular targets, including growth factors, inflammatory cytokines, protein kinases, apoptosis-related proteins, receptors and enzymes. Swertiamarin also modulates the activity of several transcription factors, and their signaling pathways in various pathological conditions are also discussed. Moreover, we have highlighted the toxicity profile, pharmacokinetics and possible structural modifications of swertiamarin. The pharmacological activities and therapeutic potential of swertiamarin have been extensively investigated. However, more advanced studies are required including clinical trials and studies on the bioavailability, permeability and administration of safe doses to offer swertiamarin as a novel candidate for future drug development.

Keywords: swertiamarin, *Enicostemma littorale*, biosynthesis, metabolic pathway, molecular targets, inflammatory cytokines

Introduction

Natural products obtained from medicinal plants have been investigated in recent years to improve human health by fighting a wide range of diseases. Natural products remain a source of therapeutic agents and have shown beneficial uses.

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Original Article

UV-SPECTROPHOTOMETRIC METHOD DEVELOPMENT AND VALIDATION FOR ESTIMATION OF SAXAGLIPTIN IN API AND PHARMACEUTICAL DOSAGE FORM

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ABSTRACT

Objective: A new sensitive, economical, simple, rapid UV spectrophotometric method has been developed for the estimation of Saxagliptin in API and pharmaceutical formulation.

Methods: Calibration curve method was used for the estimation of Saxagliptin in API and pharmaceutical formulation.

Results: The method was validated for linearity, range, accuracy, precision, robustness, LOD, LOQ. Linearity was found in the range of 10-60µg/ml. Accuracy was performed by using a recovery study. The amount of drug recovered was found to be in the range of 99.01-100.1%. All the parameters were validated as per the ICH guidelines.

Conclusion: This method is suitable forused routine analysis of present Saxagliptin in API and Pharmaceutical dosage form.

Keywords: Saxagliptin, UV spectrophotometer, Method validation, Methanol

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INTRODUCTION

Saxagliptin chemically is (1S, 3S, 5S)-2-[(2S)-2-amino-2-(3-hydroxy-1-adamantyl)acetyl]-2-azabicyclo[3.1.0.] hexane-3-carbonitrile [1]. Molecular formula is $C_{18}H_{25}N_3O_2 \cdot H_2O$ and the molecular weight is 333.43 [2]. Saxagliptin is an anti-diabetic drug and dipeptidyl peptidase-4 inhibitor class of the drug. Saxagliptin is breakdown of incretin hormones and increasing the level of these hormones on the body. Increase in incretin hormones production it gives beneficial action due to saxagliptin [2, 3]. Increasing insulin production in response to meals and gives the result of decreasing the amount of glucose that is liver produces. Saxagliptin is available in the form of tablets. Saxagliptin it is a white powder and freely soluble in methanol, acetonitrile, acetone, polyethylene glycol, ethanol [4, 5]. Literature survey carried out in that Saxagliptin has been estimated by HPLC, UV, LCMS/MS and stability method bye LC-MS [6, 7]. The present research study is a simple, sensitive, accurate and precise UV spectrophotometric method for the estimation of Saxagliptin in the API and its dosage forms with methanol as a solvent [8, 9].

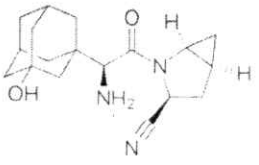

Fig. 1: Chemical structure of saxagliptin [2]

MATERIALS AND METHODS

Instrument and chemicals

A systronic UV-visible double beam spectrophotometer-2201 was used for the recording of spectra and measuring absorbance. Electronic analytical weighing balance (Shimadzu, AY220) is used for the weighing purpose. Sonicator (Oscar Ultrasonic Cleaner Microclean) it is used for the dissolving the saxagliptin into the methanol. Saxagliptin pure drug was gifted by Torrent Pharmaceutical Ltd. Ahmadabad, Gujarat. Tablets of 25 mg strength were purchased from the local pharmacy in Solapur and its brand name is Riax (Dr. Reddy's). Methanol is used as a solvent in this study.

Experimental work

Method development

Preparation of standard stock solution

Standard stock solution of Saxagliptin was prepared by transferring and accurately weight 10 mg Saxagliptin into 10 ml calibrated volumetric flask containing 6 ml of methanol and volume was made up to the mark by using a solvent to gives the concentration of 1000 ug/ml. Shaking well and solicitation was carried out for the uniform mixing. Form this take 2.5 ml of the solution was again transferred into 25 ml volumetric flask and make up the volume with methanol to give a concentration of 100 µg/ml it is a standard stock solution and further dilution was carried out with methanol to get concentration range of 10-60 µg/ml

Determination of absorption maxima

The standard stock solution of 100µg/ml was scanned in the range of 200-400 nm to determine the wavelength of maximum absorption. The drug showed maximum absorption at 213 nm.

RESULTS AND DISCUSSION

Method development [3]

Analytical method development it plays important role in pharmaceutical dosage forms. This graph indicates the identification of saxagliptin. Standard solution i.e. (50 µg/ml) of saxagliptin was scanned at 200-400 nm range in UV Visible spectrophotometer. Maximum absorbance was found to be at 213 nm.

The methods were validated for several parameters like Linearity, Accuracy, Precision, Robustness, Limit of Detection, Limit of Quantification and Specificity of saxagliptin.

Linearity and range

1, 2, 3, 4, 5, 6 ml of standard Saxagliptin solution was transferred into a series of 10 ml volumetric flask. The volume was made up to the mark with methanol to obtain the concentration of 10, 20, 30, 40, 50,

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Int J Curr Pharm Res, Vol 12, Issue 5, 27-30 Original Article

DEVELOPMENT AND VALIDATION OF UV-SPECTROSCOPIC METHOD FOR ESTIMATION OF IPRATROPIUM BROMIDE IN API AND IN PHARMACEUTICAL DOSAGE FORM

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ABSTRACT

Objective: To developed and validated UV spectrophotometric method for the estimation of ipratropium bromide in API and pharmaceutical formulation.

Methods: Methanol is used as a solvent and the absorbance of the drug was measured at absorbance's maxima of ipratropium bromide max is 214 nm.

Results: Maximum absorbance obtained in 214 nm. Calibration curve plotted in concentration range 20-120 µm/ml exhibit the linearity relationship with line equation y=.0.0091x+0.1503 The Accuracy was found to be 99.7-100.2%, the precision %RSD= 0.08613-0.2668, and the LOD and LOQ is 6.33, 19.19. The method was found to comply all the validation parameters as per the ICH guideline indicating the sensitivity of the method analyte.

Conclusion: This method is used as satisfactory for the routine analysis of ipratropium bromide in API and pharmaceutical dosage forms.

Keywords: Ipratropium bromide, UV Spectrophotometer, Methanol, Validation

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INTRODUCTION

Ipratropium Bromide chemically is [8-methyl-8-(1-methyl ethyl)-8-azoniabicyclo [3.2.1] oct-3-yl] 3-hydroxyl-2-phenyl-propanoate (fig. 1). Ipratropium bromide was used for various bronchial disorders in rhinitis and as an antiarrhythmic [1, 2]. It is opens up the medium and large airways in the lungs. Ipratropium bromide is stable and it affects the safety and efficacy of the finished drug product. Ipratropium bromide is freely soluble in water, methanol and sparingly soluble in ethanol. In this method, methanol is used as a solvent. Various methods were developed by using HPLC, IR, MS, UV and others [3, 4].

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REVIEW ARTICLE

A Brief Review Onemulgel – A Novel Topical Drug Delivery System

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ABSTRACT:

Topical drug delivery system can be defined as direct effects of formulation or drug containing medication to the skin to get localizing effect of drug or directly cure cutaneous disorders. Emulgels has to be used as a topical drug delivery system for hydrophobic drugs. When gels and emulsions are used in combined form the dosage forms are referred as emulgels. Emulgels have emerged as one of the most interesting topical delivery system as it has dual release control system i.e. gel and emulsion. The major objective behind this formulation is delivery of hydrophobic drugs to systemic circulation via skin. In recent years, there has been great interest in the use of novel polymers which can function as emulsifiers and thickeners because the gelling capacity of these compounds allows the formulation of stable emulsions and creams by decreasing surface and interfacial tension and at the same time increasing the viscosity of the aqueous phase. In fact, the presence of a gelling agent in the water phase converts a classical emulsion into an emulgel. Emulgels for dermatological use have several favourable properties such as being thixotropic, greaseless, easily spreadable, easily removable, and emollient, no staining, water-soluble, longer shelf life, and bio-friendly, transparent and pleasing appearance. These emulgels are having major advantages on novel vesicular systems as well as on conventional systems in various aspects. Various permeation enhancers can potentiate the effect. So emulgel formulations can be used as better topical drug delivery systems over present conventional systems available in market.[1,2]

KEYWORDS: Topical drug delivery system, Emulgels, Hydrophobic drugs, Gelling agents, enetration enhancers.

INTRODUCTION:

The topical drug delivery system is generally used where these systems of drug administration fails or in local skin infection like fungal infection. Topical drug delivery system can be defined as direct effects of formulation or drug containing medication to the skin to get localizing effect of drug or directly cure cutaneous disorders. Dermatological products applied to skin are diverse in formulation and range in consistency from liquid to powder but the most popular products are semisolid

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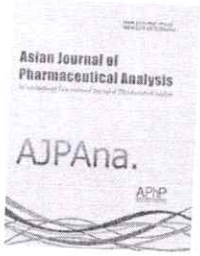

RESEARCH ARTICLE

Development and Validation of UV Spectroscopy Method for the Estimation of Dolutegravir in Bulk and Pharmaceutical Dosage Form

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ABSTRACT:
UV spectroscopic method was developed for the estimation of Dolutegravir in bulk and Formulation.The UV spectrum of Dolutegravir in methanol and water mixture showed λmax at 254nm. Beer's law is valid in the concentration range of 10-50µg/ml. This method was validated for linearity, accuracy, precision, LOD and LOQ. The method has demonstrated excellent linearity over the range of 10-50µg/ml with regression equation y = 0.030x + 0.008 and regression correlation coefficient r^2= 0.998. However, the method was found to be highly sensitive with LOD (2.056µg/ml) and LOQ (6.230µg/ml). Depending on results the given method can be successfully applied for assay of Dolutegravir in formulation.

KEYWORDS: Linearity, Regression correlation coefficient.

INTRODUCTION:

Dolutegravir is chemically designated as Isopropyl (4R,12aS)-N-(2,4-difluorobenzyl)-7-hydroxy-4-methyl6,8-dioxo-3,4,6,8,12,12a-hexahydro-2H-pyrido[1',2':4,5] pyrazino[2,1-b][1,3] oxazine-9-carboxamide. Its molecular formula is C20H19F2N3O5, and its molecular weight is 441.37 g/mol

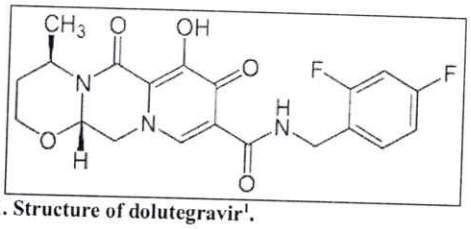

Figure 1. Structure of dolutegravir[1].

Dolutegravir is a HIV-1 integrase inhibitor that blocks the strand transfer step of the integration of the viral genome into the host cell (INSTI). Dolutegravir belongs to a group of HIV drugs called 'integrase' inhibitors. Integrase inhibitors block HIV enzyme called integrase. By blocking integrase, it prevent HIV from multiplying and can reduce the amount of HIV in the body. The effect of this drug has no homology in human host cells which gives it an excellent tolerability and minimal toxicity. Dolutegravir was developed by ViiV Healthcare and FDA approved it on August 12, 2013. Dolutegravir is indicated in combination with other antiretroviral agents for the treatment of patients with HIV-1 infection that comply with the characteristics of being adults or children 12 years and older and present at least a weight of 40 kg[2]. DTG is a drug that is more effective, easier to use and has fewer side effects than alternative drugs that are currently used. Based on new evidence assessing benefits and risks, the WHO recommends the use of the INTI- HIV drug dolutegravir (DTG) as the preferred first-line and second-line treatment for all populations including pregnant women and those of childbearing potential[3].

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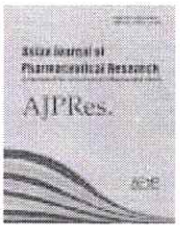

RESEARCH ARTICLE

UV Spectrophotometric Method Development and Validation of Carbimazole in Bulk and Tablet Dosage form

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ABSTRACT:

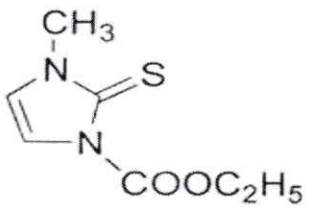
Objective: A new, simple, sensitive, precise, reproducible UV visible spectrophotometric method was developed for the estimation of Carbimazole in Tablet dosage form. **Methods:** The UV spectrum of Carbimazole in methanol and distilled water (30:70) showed λ max at 289.6nm. Beer's law is valid in the concentration range of 10-50µg/ml. This method was validated for linearity, accuracy, precision, ruggedness and robustness. **Results:** The method has demonstrated excellent linearity over the range of 10-50µg/ml with the regression equation y = 0.0232x + 0.0466, and regression coefficient i.e, r^2= 0.9992 moreover, the method was found to be highly sensitive with LOD (1.818µg/ml) and LOQ (5.509µg/ml). **Conclusion:** From the results it can be concluded that the given method can be successfully applied for assay of Carbimazole in Tablet dosage form.

KEYWORDS: Carbimazole, UV spectroscopy, Method development and Validation, Methanol and Distilled Water, Tablet formulation.

INTRODUCTION:

Hyperthyroidism is a condition characterized by increased in synthesis and secretion of thyroid hormones from thyroid gland.[1] Carbimazole is an antihyperthyroidism drug.[2] It is a pro-drug and after absorption it gets converted to active form, methimazole.[3] Methimazole acts by preventing the thyroid peroxidase enzyme and reducing the production of the thyroid hormones T3 and T4 (thyroxine).[4]

Carbimazole is rapidly and almost completely converted to methimazole, either in the gastrointestinal tract or immediately after absorption, because drug concentrations of methimazole but not carbimazole are detected in the serum and thyroid gland after ingestion. Carbimazole (CBZ) is rapidly metabolized in serum to methimazole (MMI).[5]



Carbimazole

Figure 1: Chemical Structure of Carbimazole

The Chemical name of Carbimazole is (Ethyl 3-methyl-2-sulfanylidene-2,3-dihydro-1H-imidazole-1-carboxylate).[6] The molecular formula of Carbimazole is C7H10N2O2S and molecular weight is 186.232gm/mol. Carbimazole is white powder and has melting point 122° to 125°C. It is freely soluble in water, methanol, ethanol and chloroform.[7,8] The aim of this study is to introduce a new, simple, sensitive, precise and reproducible UV spectroscopic method for the estimation of Carbimazole in bulk and tablet formulation.

UV SPECTROPHOTOMETRIC METHOD DEVELOPMENT AND VALIDATION OF NIFEDIPINE IN BULK AND FORMULATION

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ABSTRACT:

Objective: A new, simple, sensitive, precise and reproducible UV spectroscopic method was developed for the estimation of Nifedipine in bulk and Formulation.

Methods: The UV spectrum of Nifedipine in phosphate buffer ph7.4 showed λ max at 213nm. Beer's law is valid in the concentration range of 5-25µg/ml. This process was authenticated for linearity, accuracy, precision, ruggedness and robustness.

Results: The method has demonstrated excellent linearity over the range of 5-25µg/ml with regression equation y = 0.025x + 0.014and regression correlation coefficient r = 0.996. Moreover, the method was found to be highly sensitive with LOD (5.64µg/ml) and LOQ (1.86µg/ml).

Conclusion: Depending on results the given method can be successfully applied for assay of Nifedipine in Semisolid formulation.

Keyword: Nifedipine, UV spectroscopy, method development and validation, Phosphate buffer ph7.4, Formulation.

INTRODUCTION:

Nifedipine is a used for the treatment of calcium channel blocker used as an anti-hypertensive agent. The anti-hypertensive agent prevents the complication of high blood pressure, such as stroke and myocardial infarction. Nifedipine is the first generic medication. It was discovered by Bayer in 1972. Nifedipine is a BCS class II drug having low solubility and high permeability. Nifedipine is almost completely absorbed in the gastrointestinal tract.

Figure1: Structure of Nifedipine

DEVELOPMENT AND VALIDATION OF UV SPECTROSCOPY FOR ACYCLOVIR IN BULK AND SOLID DOSAGE FORMULATION

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ABSTRACT:

A new, unique, simple, sensitive, precise and reproducible UV spectrophotometric method was developed for the estimation of Acyclovir in API (Active Pharmaceutical Ingredient) and Solid dosage Formulation. The UV spectrum of Acyclovir in 7.4 pH Phosphate buffer showed λ max at 251 nm. Beer's law is valid in the concentration range of 4-16µg/ml. The above described method was validated for linearity, accuracy, precision, ruggedness and robustness. The method has demonstrated excellent linearity over the range of 4-16µg/ml with regression equation y = 0.054 x +0.087 and regression correlation coefficient r^2= 0.99688. Further, the method was found to be highly sensitive with LOD (1.128µg/ml) and LOQ (3.420µg/ml). As per the results of given method can be successfully applied to perform assay of Acyclovir for Tablet/Solid dosage formulation.

Keyword: Acyclovir, UV spectroscopy, method development and validation, 7.4 pH Phosphate Buffer, Solid Dosage Formulation.

I. INTRODUCTION:

Acyclovir is a selective inhibitor of the replication of herpes simplex virus type 1 and 2 and varicella-zoster virus. It is converted by virus encoded thymidine kinase to its monophosphate derivative, an event that does not occur to any substantial extent in uninfected cells. This drug better percutaneous absorption and shows to be more active as antiviral activity [1].

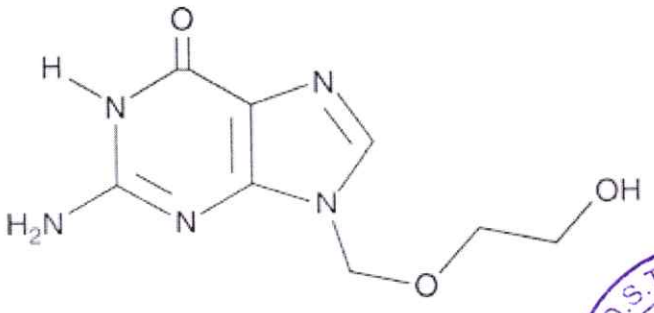

Figure1: Structure of Acyclovir

Acyclovir has low solubility in water but it has freely soluble in dimethyl sulfoxide and very slightly soluble in alcohol [2]. Acyclovir has low oral bioavailability of 10-20%. Acyclovir administered by the oral, topical, & intravenous route in herpes infection [3].

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METHOD DEVELOPMENT AND VALIDATION OF AMOXICILLIN TRIHYDRATE IN BULK AND SOLID DOSAGE FORM BY UV SPECTROSCOPY

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ABSTRACT:

Objective: A new, simple, sensitive, precise and reproducible UV spectroscopic method was developed for the estimation of Amoxicillin Trihydrate in bulk and Solid Formulation.

Methods: The UV spectrum of Amoxicillin Trihydrate in 0.1% TFA showed λ max at 228 nm. Beer's law is valid in the concentration range of 10-50µg/ml. This method was validated for linearity, accuracy, precision, ruggedness and robustness.

Results: The method has demonstrated excellent linearity over the range of 10-50µg/ml with regression equation y = 0.021-0.122 and regression correlation coefficient r^2 = 0.999. Moreover, the method was found to be highly sensitive with LOD (1.57µg/ml) and LOQ (4.76µg/ml).

Conclusion: Depending on results the given method can be successfully applied for assay of Amoxicillin Trihydrate in Solid formulation.

Keyword: Amoxicillin Trihydrate, UV spectroscopy, method development and validation, 0.1% TFA, Solid Formulation.

INTRODUCTION:

Amoxicillin Trihydrate is an antibiotic used to treat a number of bacterial infections. These include middle ear infection, strep throat, pneumonia, skin infections, and urinary tract infections among others .It is taken by mouth, or less commonly by injection.

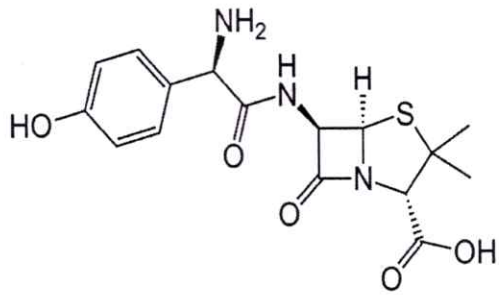

Figure1: Structure of Amoxicillin Trihydrate

Amoxicillin Trihydrate is soluble in methanol: water, TFA and Ethanol. The aim of this study is to give a new, simple, sensitive, precise and reproducible UV spectroscopic method was developed for the estimation of Amoxicillin Trihydrate in bulk and Solid formulation[1-3].

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UV SPECTROPHOTOMETRIC METHOD DEVELOPMENT AND VALIDATION FOR ESTIMATION OF PROGESTERONE IN BULK AND TABLET DOSAGE FORM

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ABSTRACT:

Objective: The objective of the present work is to develop a new, simple, economical, precise, sensitive, linear, accurate, rapid UV Spectrophotometric method has been developed for the estimation of Progesterone in bulk and pharmaceutical formulation as per ICH guidelines.

Method: Spiked Progesterone arrangement was checked over UV-visible extends for its wavelength of greatest absorbance.

Results: The wavelength of most extreme absorbance for Progesterone was found to be 241.6 nm. The relationship coefficient over the concentration extend of 3-15µg/ml was found to be 0.9982. The LOD and LOQ of Progesterone were found to be 30.8722 and 93.5521 respectively. The method was successfully applied to Progesterone in marketed formulation and results were in good agreement with label claims.

Conclusion: Depending on the results, the given method can be successfully applied of Progesterone in Table formulation.

KEYWORDS: Progesterone, Methanol, UV-Visible Spectrophotometric method, Development, Validation.

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FORMULATION AND EVALUATION OF SELF MICROEMULSIFYING DRUG DELIVERY SYSTEM OF TELMISARTAN

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ABSTRACT

Telmisartan is Angiotensin II Receptor Antagonist, which is used in the prevention and treatment of hypertension. Major drawback of Telmisartan is its low water solubility and high permeability. Nearly 40% of new drug candidates exhibit low solubility in water, which leads to poor oral bioavailability, high intra- and inter subject variability and lack of dose proportionality. Hence, various approaches are used to improve the dissolution rate of drugs for bioavailability enhancement. Amongst them, Self micro emulsifying drug delivery systems (SMEDDS) have shown great promise for enhancing bioavailability of low solubility compounds. Therefore, through this work, an attempt was made to improve the dissolution rate and thus oral bioavailabillity of Telmisartan by formulating SMEDDS. The system consisting of Labrafac PG, Tween 80 and PEG 400 with a drug load 20 mg/ml was formulated and evaluated for various parameters like stability, *in vitro* drug release, drug content. Stability studies reveal that F_1, F_2, F_3, F_4, F_5 and F_7 were stable at 4°c and 45°c temperatures which indicate its thermodynamic stability. The drug content was varied from 97.89% to 99.16%. The optimized SMEDDS formulation F_4 showed a significant increase in the dissolution rate and oral absorption compared to the plain drug. Therefore we may conclude that the SMEDDS can become a reliable technique for the solubilization of poorly water soluble drug, specially to overcome the problem associated with solubility.

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Formulation and evaluation of lignocaine hydrochloride topical gel

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Online published on 30 April, 2021.

Abstract

Objective: The present research has been undertaken for the formulation and evaluation of lignocaine hydrochloride gel. It is used for topical use for the local anaesthetic activity. Methods: Carbopol 934 was used as a polymer in various batches. The ratio of Carbopol 934 was changed for various batches. Developed Formulations of Physicochemical parameters such as percentage yield, drug content, pH, Viscosity, Spreadability, Extrudability and In-vitro Diffusion study were carried out for developed batches of Lignocaine Hydrochloride. Results: Viscosity studies of various formulations Exhibited that Formulation F2 was better than that of F and F3. From among all the developed formulation, F2 Shows better rheological properties and excellent Extrudability. pH of the F2 Batch is Sufficient to treat the pain. Percentage yield and drug content of F2 batch is good than other batches. Results shows that the concentration of Carbopol 934 gives the good rheological properties and drug contents. In-vitro Diffusion studies were carried out, F2 batch shows better results than that of the other two batches i.e. 96.06%. Conclusion: It was concluded that F2 batch is the good than the other batches. So F2 batch is good for the topical use.

Keywords

Lignocaine Hydrochloride, Carbopol 934, Topical gel, Formulation and evaluation, Invitro Diffusion Study.

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FORMULATION AND EVALUATION OFANTI-ACNE POLYHERBAL CREAM

Sunil S. Mathapati, Mrunal Manoj Sabale*, Akshada Rajesh Shendge, Aarzoo Ismail Shaikh, Megha Hari Salgar, Arbaz Nazakatali Shaikh and Suraj Bajarang Saykar

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ABSTRACT

Natural remedies are more acceptable in the belief that they are safer with fewer side effects than the synthetic ones. Herbal formulations have growing demand in the world market. The present work deals with the development and evaluation of the herbal Anti-Acne cream. Herbal cosmetics are the preparations used to enhance the human appearance. The aim of the present research was to formulate the herbal Cream for the purpose of anti-inflammatory, astringent, antioxidant, anti-fungal, anti-septic, anti-bacterial and Treatment of Acne. Different crude drugs; *Rubia cordifolia* (Manjistha Root), *Symplocos racemosa* (Lodhra Bark), *Coriandrum sativum* (Coriander Seed oil), *Azadirachta indica* (Neem oil), *Lavandula angustifolia* (Lavender Oil) were taken. Accelerated stability testing of final sample has been conducted in the environmental chamber with temperature 25 ± 1°C. The product was found to be stable with no sign of phase separation and no change in the colour. This work mainly focuses on the assessment of the anti-acne property of Formulated cosmetic preparation. Thus, herbal cosmetics formulation is safe to use was proved as it showed the better anti-microbial activity and it can be used as the provision of a barrier to protect skin.

KEYWORDS: Acne vulgaris, Anti-acne, Cosmeceutical, Manjistha; Lodhra.

INTRODUCTION

The concept of beauty and cosmetics is as ancient as mankind and civilization. Indian herbs and its significance are popular worldwide. An herbal cosmetic have growing demand in the world market and is an invaluable gift of nature. Herbal formulations

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REVIEW OF NANOEMULSION: FORMULATION APPROACHES AND APPLICATION OF NANOEMULSION.

Shrishail Ghurghure, Jyoti A. Khadtare*, Manisha Dyawarkonda, Varsha Jakune, Aarti Khadtare.

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Abstract:

In pharmaceutical formulations nano emulsions are composed of practical within nanometer range. They have capacity to encapsulate drugs that are poorly water soluble due to their hydrophobic nature and also they are composed of safe gradient excipients which makes them safer and stable option to drug delivery. For several decades cancer therapy has been an issue because drugs developed to treat this disease and not always successful or and up failing, mainly due to low solubility and unspecific toxicity. This problem can be resolved by nanoemulsion because it not only solve water solubility problems but also provides specific targeting to cancer cells. This chapter includes overview about the nanoemulsion and various approaches for production of nanoemulsions which include high energy approach such as microfluidizer high pressure valve homogenization, ultrasonic homogenization. In low energy approaches, spontaneous emulsification phase inversion composition, phase inversion temperature and emulsion inversion point are discussed in detail.

Keywords: nanoemulsion, production approaches, applications

Introduction:

This review article provides detailed information about various formulation and approaches used to prepare the nanoemulsion. Emulsions could be oil-in-water (O/W) , water-in-oil (W/O), and oil-in-oil (O/O) type. Emulsifier is also used as a third component playing an important role in dispersing two immiscible liquids (continuous phase and dispersed phase). Emulsions are the heterogenous system which is classified based on the nature of emulsifier used and structure of the system formed. The various structures of the emulsions system includes nanoemulsions, microemulsions, mixed, double and multiple emulsions. Nowadays, nanoemulsions have promising medicinal applications like anticancer activity and antimicrobial activity.

The major critical factor for emulsion is their breakdown processes. Ostwald ripening, Creaming, phase inversion, sedimentation, flocculation, coalescence and are the various breakdown processes which are involved in instability of the emulsion formed, microbial contamination, Oxidation, and adverse storage conditions are some of the types of chemical instability. Emulsions are characterised by various methods such as fluorescence test, dye test, dilution test, globule size analysis, conductivity, accelerated stability, and macroscopic examination.

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A brief review on Herbal Medicines

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Online published on 3 June, 2021.

Abstract

Herbal medicine (also Herbalism) is the study of pharmacognosy and the use of medicinal plants. Plants have been the basis for m Archaeological evidence indicates that the use of medicinal plants dates back to the Paleolithic age, approximately 60, 000 years a plants.

Keywords

Herbal medicine, Archaeological evidence.

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METHOD DEVELOPMENT AND VALIDATION OF RILPIVIRINE IN BULK AND SOLID DOSAGE FORM BY USING UV-VISIBLE SPECTROPHOTOMETRIC METHOD

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ABSTRACT:

A new, simple, selective, precise and economical UV spectroscopic method was developed for the estimation of Rilpivirine in bulk forms and tablet formulation. The spectrophotometric detection was passed out at an absorption maximum of 304 nm using acetonitrile (50%) and water (50%) as solvent. The method was validated for specificity, linearity, accuracy, precision. The detector response for the Rilpivirine was linear over the selected concentration range 4-20µg/ml with a correlation coefficient of 0.9988. The accuracy was between 98.71 and 99.99%. The precision among six sample preparations was 0.11. The LOD and LOQ are 0.89µg/ml and 2.69µg/ml respectively. The validation was carried out as per ICH guidelines. All the validation parameters were within the acceptable range. The development method was easy, rapid, linear, precise, and consistent. As economical solvent is used, these methods can be used for routine analysis of Rilpivirine in bulk and pharmaceutical formulation.

Keywords: Rilpivirine, Validation, Precision, linearity, RSD.

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Keywords: Intra-uterine () Drug Delivery System () uterus () Contraceptives () IUD () Advantages () Disadvantages. ()

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A Brief Review on Intra-Uterine Drug Delivery Systems

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Avinash Birajdar, Saurabh Nangare, Sagar Adlinge, Swaminath Ramanshetti, Akhil Patil,
Yash Kothari, Pandurang Choure, Aaqueeb Mangalgiri, Sneha Ubale, Vaishnavi Dulange,
Bhavana habib, Jyoti Mittha

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ABSTRACT:
The Purpose of writing this review on Intra-uterine drug delivery systems was to compile the recent literature with special focus on various Intra-uterine approaches that have recently become leading methodologies in the field of site specific orally administered controlled release drug delivery. The drug releases in uterine to terminate the pregranacy. Advantages and Disadvantages of IUDDS covered in details. In intrauterine drug delivery system IUD (Intauterine Devices) are used and which are of various types and which are effective for three to ten years depending on type. The IUD is a long-acting reversible method of contraception. An intra-uterine device is a special device that fits inside of the uterus. Intrauterine Device (IUD) is a small object that is inserted through the cervix and placed in the uterus to prevent pregnancy. A small string hangs down from the IUD into the upper part of the vagina. The IUD is not noticeable during intercourse. IUDs can last 1-10 years. They affect the movements of eggs and sperm to prevent fertilization. They also change the lining of the uterus and prevent implantation. IUDs are 99.2-99.9% effective as birth control. They do not protect against sexually transmitted infections, including HIV/AIDS. Insertion of an IUD takes only about 5 to 10 minutes. A clinician must insert an IUD. It is usually done when you are on your period. The clinician will perform a pelvic exam and check to see where your uterus is positioned. They will then insert a speculum into your vagina to see your cervix and then wash your cervix with an antiseptic solution. An IUD prevents pregnancy by stopping sperm from reaching an egg that your ovaries have released. It does this by not letting sperm go into the egg. The

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REVIEW ARTICLE

A Brief Review on Controlled Dru Delivery System

Vinod Matole*, Akshay Javalgikar, Anup Dhange, Av sh Birajdar, Smita Kumbhar, Saili Madur, Smeeta Patil, Anita Shegaonkar, Sachi ane, Anuja Suryawanshi, Akshata Lasure, Suyash Ingle, Swaminath R etti, Yash Kothari
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ABSTRACT:
Controlled drug delivery system is to make sure safety and to im e effectiveness of the drugs as well as patient compliance. A controlled release system includes any deliv n that slow release of the drug over an extended period of time. This is achieved by control of plasma d nd less frequent dosing.

KEYWORDS: Controlled Drug delivery System, Release, Kinetic codynamics.

INTRODUCTION:

For many decades' treatment of an acute disease or a chronic illness has been mostly accomplished by delivery of drugs to patients using various pharmaceutical dosage forms, including tablets, capsules, pills, suppositories, creams, ointments, liquids, aerosols, and injectable as drug carriers. Even today these conventional drug delivery systems are the primary pharmaceutical products commonly seen in the prescription and over the counter drug market place. This type of drug delivery system is known to provide a prompt release of drug. Therefore, to achieve as well as to maintain the drug concentration with in therapeutically effective range needed for treatment, it is often necessary to take this type of drug delivery system several times day. This result in a significant fluctuation in drug levels. In order to overcome these problems-controlled drug delivery systems were employed.

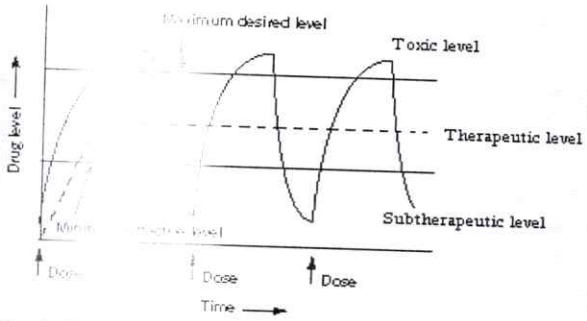

Fig. 1: H drug concentration profiles in the systemic circulation from the consecutive administration of multiple immediate release drug delivery system compared drug concentration profile required for treatmen

1. ADV CTS:

i. Patien **nce: (patient acceptability):**
Lack of nce is generally observed with
1. Long ment of chronic disease.
2. Incre r of doses.
3. Incre ffects

The pr ack of patient compliance can be resolved extent by administering controlled release y system.

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Hepatoprotective activity of *Cynodon dactylon* leaf extract against rifampicin- induced liver damage in albino rats

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ABSTRACT

Liver plays an important role in maintaining the biological equilibrium of vertebrates. Liver diseases are a major worldwide health problem with high endemicity in developing countries. They are mainly caused by chemicals and some drugs when taken in very high doses. Despite advances in modern medicine, there is no effective drug available that stimulates liver function, offer protection to the liver from damage or help to regenerate hepatic cells. There is urgent need, therefore, for effective drugs to replace/supplement those in current use. The plant kingdom is undoubtedly valuable as a source of new medicinal agents. The main aim of any medication in the treatment of liver disorders is to prevent degeneration of hepatocytes and associated metabolic abnormalities and promote regeneration of hepatic cells. In present study the hepatoprotective activity of Cynodon dactylon extracts was evaluated in rifampicin induced liver toxicity by biochemical parameters like SGPT, SGOT, ALP, BIT and by histopathological study. Acute administration of rifampicin produced marked elevation of the serum levels of the above parameters compared to that of the control group. Treatment with ethanolic and aqueous extracts of *Cynodon dactylon* leaves at doses of 200 and 400 mg/kg produces significant prevention in rifampicin induced rise of the above parameters. *Silymarin* at 100 mg/kg body weight significantly prevented such rise in study. The effect of *Cynodon dactylon* leaves extracts was found possess promising hepatoprotective activity. Further studies in other species and on other parameter would throw more light on this plant.

Keywords: Plant extract, Hepatoprotective activity, *Cynodon dactylon*, Rifampicin- induced liver damage.

INTRODUCTION

Ayurvedic system of medicine is one of the oldest systems in India. The World health Organization has estimated that 80% of the world's population continues to use traditional therapies such as herbs and herbal products, which has incredibly wide use throughout time and place. It has been providing real health benefits with maintaining safety profile [1]. In India, Herbal formulations have widely used as therapeutic agents include antidiabetics, nootropics, hepatoprotective and lipid lowering agents [2].

Cellular necrosis, reduction of GSH levels in tissue and increases the lipid peroxidation in tissue is associated with liver damage. In addition, serum levels of many biochemical markers like ALT, AST, ALP, Direct and Total Bilirubin, Total Cholesterol, HDL Cholesterol, are elevated. In spite of phenomenal growth of modern medicine, there are few synthetic drugs available for the treatment of hepatic disorders such as Silymarin, is a popular remedy extracted from the *Silybium marainum* (milk thistle) for hepatic disorder [3].

Presently only a few natural sourced hepatoprotective drugs are available for the treatment of liver diseases [4].

Literature survey indicates *Cynodon dactylon* (Family: *Poaceae*), commonly known as Bermuda grass [5]. It is abundantly available along the roadsides and lawns. The grass grows faster in uncultivated area [6]. *Cynodon dactylon* is used as a folk remedy for bronchitis, anasarca, calculus, dropsy, hemorrhage, urogenital disorders, cough, headache, sores, cancer, carbuncles, convulsions, cramps, cystitis, dysentery, epilepsy, hemorrhoids, leukoderma, hypertension, hysteria, asthma, tumors, measles, rubella, snakebite, stones, warts, wounds, eye disorders week vision and dandruff, fever. It is also useful against the algesia, inflammations, toothache in children.

Various parts of the herb *Cynodon dactylon* have been studied for pharmacological action and fresh leaves extract was tested for its hepatoprotective activity on mice liver [7]. Keeping this in view it was thought

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International Journal of Pharma and Bio Sciences

Original Research Article

Pharmaceutics for enhanced drug delivery

Synthesis, Characterisation and Evaluation of *in Vitro* Anticancer Activity of Quercetin Mediated Silver Nanoparticles

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Abstract: Nanomedicines are based on multifunctional particles that may encapsulate active therapeutics within their nanoscale framework, and are capable of releasing the therapeutic payload in an exceedingly specific manner. Metal nanoparticles exhibit remarkable physical and chemical properties which basically depends on particle size and surface configuration. Mainly, gold (Ag) and silver (Au) nanoparticles have been broadly investigated because of their applications in a variety of pharmaceutical fields. At present, a variety of cytotoxic agents have been used in the treatment of breast cancer, but the effectiveness and demerits are unclear. Quercetin is an antioxidant, anticarcinogenic, antimicrobial, antimutagenic, anti-inflammatory, antiallergic. Quercetin has also been shown to reduce human breast cancer cell invasion via down-regulation of MMP-1, -2, and -9 expression. The present study was designed to synthesize silver nanoparticles (AgNPs) using Quercetin and to evaluate potential toxicity and the general mechanism of synthesized AgNPs in MDA-MB-231 human breast cancer cells. The method used for synthesis of nanoparticles was a chemical reduction method. Quercetin is employed as a reducing agent for Silver Nitrate ($AgNO_3$). AgNPs containing different concentrations of Quercetin were synthesized. Synthesized NPs were evaluated by spectroscopic methods like UV-visible and FTIR spectroscopy, physico-chemical properties and anticancer activities. Thermal analysis of NPs showed a decrease in melting point with endothermic peak at around 130°C. Particle size analysis of NPs showed mean particle size 95.81 nm & 0.091 Polydispesity Index (PDI). The morphological characterization of silver nanoparticles was done using Scanning Electron Microscopy. Zeta potential analysis showed the nanoparticles were stable with values +29.66 mV. The *in vitro* anticancer activity showed the IC_{50} value <10 µg and 100% inhibition at 20 µg, whereas pure Quercetin showed IC_{50} at 13 µg/ml on MDA- MB 231 cell line (human breast carcinoma). Therefore, our findings recommend that the synthesized Quercetin AgNPs could be more cytotxic than pure Quercetin.

Keywords: Quercetin, Silver nanoparticles, *in vitro* anticancer activity, MDA- MB 231 cell line

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Research Article

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FORMULATION AND EVALUATION OF *TRIDAX PROCUMBENS* HERBAL GEL

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ABSTRACT

Herbal gels are used since many years. Gel is the semisolid dosage form of at least two constituents, consisting of a condensed mass enclosing and interpenetrated by a liquid. It has an easy application, easy removable property. It is widely accepted dosage form, and it has more patient compliance. *Tridax procumbens* is an anti-bacterial drug, it also has wound healing activity for such activity it has been used in traditional medicinal systems in India, the rural parts of country still has a wide use of this plant. When it comes to its use in combination with certain modern dosage forms, gel seems to be a good option. This article gives 2 formulations of herbal gel, which contains. *Tridax procumbens* aqueous extract, carbopol 940 as a base in combination with triethanolamine.

KEYWORDS

Tridax procumbens, Anti-bacterial activity and Herbal Gel.

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INTRODUCTON

Traditional medicines has importance in India since hundreds of years and it has potential action on various diseases and disorders therefore it is an impactful way of treatment. As we are aware about importance of traditional medicines but it also has certain drawbacks, like lack of research, limited literature, and low patient compliance towards traditional medicine. As per reports of certain print media houses 77% of households in India uses ayurvedic herbal products. Plants which have medicinal properties can be seen in variety in India. After thorough research on this plant this can be an alternative to synthetic drugs. Use of this plant for the treatment of certain bacterial infections which are caused due to *Escherichia coli*, *Staphylococcus*

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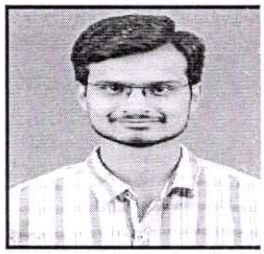

FORMULATION AND EVALUATION OF CHOLESTYRAMINE UNCOATED TABLETS FOR TREATMENT OF HYPERTHYROIDISM

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ABSTRACT

In recent years there has been an extensive research on drug development in the various aspects of the diseases like jaundice, hypercholesterolemia and hyperthyroidism. Cholestyramine is a synthetic resin in nature which has been used widely for treatment of same, it is a quaternary ammonium anion exchange resin with a strong affinity for bile salts and tablet dosage form will play a key role in its release and action. Studies also show that this resin is showing anti hyperthyroidism action, therefore based on these results this paper gives a brief application of a tablet dosage form in the treatment of the hyperthyroidism.

KEYWORDS

Hyperthyroidism, Cholestyramine and Formulation.

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INTRODUCTON

Cholestyramine is a resin in nature; it forms an insoluble complex with the thyroxin. Cholestyramine is water insoluble and when it is administered orally it will enter in the gastrointestinal system but it would not absorb at any part of GIT as a result it gets entered into the intestine without any structural or chemical changes in it. As it reaches to intestine excess thyroid hormone which would be present in the intestine will bind with the cholestyramine and it will get excreted through feces[1]. T_4 uptake takes place in the duodenum, jejunum and ileum, and is approximately 70-80%.

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Original Article

UV-SPECTROPHOTOMETRIC METHOD DEVELOPMENT AND VALIDATION FOR ESTIMATION OF IPRATROPIUM BROMIDE IN API AND PHARMACEUTICAL DOSAGE FORM

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ABSTRACT

Objective: The current work intended towards the developed and validated by using Simple, rapid, sensitive, precise and specific method UV Spectrophotometric method for the estimation of Ipratropium bromide in API and pharmaceutical formulation.

Methods: Water used as a solvent and the absorbance of the drug was measured at the absorbance's maxima of Ipratropium bromide λmax is 214 nm.

Result: Calibration curve plotted in concentration range 20-120µg/ml exhibit the linearity relationship with line equation y=0.0062x+0.3161 and r^2=0.995. The Accuracy was found to be 99.5-100.1%, the precision % RSD= 0.12888-0.30533, and the LOD and LOQ is 8.78266-28.5881. The method was found to comply with all the validation parameters as per ICH guidelines indicating the sensitivity of the method towards analyte.

Conclusion: The method can be used satisfactory for the routine analysis of Ipratropium Bromide present in API and Pharmaceutical dosage form.

Keywords: Ipratropium bromide, UV spectrophotometer, Method validation

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INTRODUCTION

Ipratropium bromide is a muscarinic cholinergic antagonist and is used in asthma. Ipratropium bromide has bronchial smooth muscle relaxant properties due to its action on muscarinic receptor. Ipratropium bromide is a bromide salt form of Ipratropium, synthetic derivative of alkaloid atropine with anticholinergic properties. It is used in treating symptoms of asthma, cold, chronic obstructive pulmonary disease due to chronic bronchitis. Ipratropium bromide is short-acting anticholinergic drug in asthma.

Chemical name is (1R,3R,5S,8R)-3-[(3-hydroxy-2-phenyl propanoyl) oxy]-8-methyl-8 (propan-2-yl) 8-azabicyclo [3.2.1] octan-8-ium-bromide.

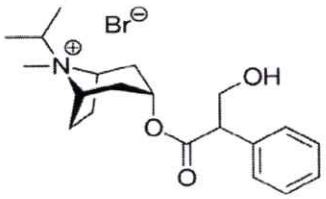

Fig. 1: Chemical structure of Ipratropium bromide

Literature survey reveals that the Ipratropium bromide has been estimated by RP-HPLC[1], LC/MS, HPTLC with fluorescence detection.

The aim of work is to develop UV spectrophotometry and RP-HPLC [2-6] method for the estimation of Ipratropium bromide in pharmaceutical formulation.

MATERIALS AND METHODS

Instrument

For weighing a calibrated weighing balance (Shimadzu AY220) of 1 mg, sensitivity was used. A systronics UV visible double beam spectrophotometer 2201 was used with 1 cm matched quartz cell. All the glassware were made of borosilicate and were calibrated.

Chemicals

API-Ipratropium bromide pure API was gifted by Vamsi Pharmaceutical Ltd. Solapur, Maharashtra.

UV spectroscopic method

Solvent selection

Ipratropium bromide is soluble in water so the water was used as the solvent.

Preparation of standard stock solution

The standard stock solution of Ipratropium bromide was prepared by transferring accurately weighed 10 mg of Ipratropium bromide into 10 ml volumetric flask containing 5 ml of water, dissolve properly. The volume was made up to the mark by using water to give a concentration of 1000 µg/ml, from this 4 ml of the solution was transferred to 20 ml of volumetric flask and made up the volume with water to give a concentration of 200 µg/ml which is a standard solution and it is further diluted with water to get concentration range 20-120µg/ml.

Determination of absorption maxima

The standard stock solution of 200µg/ml was scanned in the range of 200-400 nm to determine the wavelength of maximum absorption. The drug showed maximum absorption at 214 nm.

Preparation of calibration curve

For the preparation of calibration curve solutions of concentration 20-120 µg/ml were prepared by pipetting out 1, 2, 3, 4, 5, 6, ml of 200 µg/ml solution into 10 ml volumetric flask and made up the volume up to the mark with water. The absorption of each solution was measured at 214 nm against water as blank. Calibration curve of the Ipratropium bromide was plotted by taking the absorption obtained on the Y-axis and concentration of the solution on the X-axis. The curve showed linearity in the range of 20-120 µg/ml with a correlation coefficient of 0.9954.

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Relevance of Nanotechnology in Solving Oral Drug Delivery Challenges: A Perspective Review

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ABSTRACT: Nanotechnology is opening up new opportunities in drug delivery, including oral delivery, and it may reduce toxicity and increase drug ability. Presently, researchers are expanding their knowledge in the development of oral nanomedicine to extend the scope of oral drug delivery and exhibit excellent platforms for drug transportation, target, and controlled release. The present review is an attempt to define updated oral nanostructured systems for the delivery of a wide range of drugs. The review also focuses on the use of different polymeric and other materials, technologies adopted, and benefits/drawbacks of delivery systems.

KEY WORDS: nanotechnology, nanostructure, drug delivery, nanomedicine, oral nanosystem

I. INTRODUCTION

Oral delivery is considered the most appealing route of drug administration, but some promising therapeutic agents have failed to achieve sufficient oral bioavailability. Properties of the drug/formulation and physiology of the subject affect oral bioavailability. Drug-related factors include dissolution and solubility, stability in GI fluids, membrane permeability, resistance to enzymatic metabolism, interactions with efflux transporter systems, and so on. Several pharmaceutical techniques have been contrived to stabilize and enhance drug solubility and ultimately improve oral bioavailability but have failed to attain controlled and targeted release.[1] Hence, unpredictable absorption, fluctuation in plasma drug concentration, drug distribution in healthy tissues, toxicity, poor efficiency, and repetitive dosing are the major challenges associated with conventional oral therapy.[1–3]

In recent studies, a wide range of nanocarrier systems have been proposed as drug delivery systems. Administration of a drug through a nanocarrier system can protect it from the harsh environment of the stomach or the entire length of the GIT, control the release rate, and target drug delivery to the site of action. Hence, oral drug administration through nanocarriers can be considered a way to overcome the challenges of conventional oral therapy.[4,5]

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IJPSR (2020), Volume 11, Issue 4 **(Research Article)**

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EVALUATION OF MELATONIN AND COENZYME Q10 FOR GASTROPROTECTIVE EFFECT IN ASPIRIN AND IBUPROFEN INDUCED GASTRIC ULCERS IN RATS

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Keywords:

Melatonin, Coenzymes Q10, Rabeprazole, Ulcers and Gastroprotection

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ABSTRACT: The present study was carried out to evaluate the gastroprotective effect of melatonin, coenzyme Q10 (CoQ10) and its combinations with rabeprazole in aspirin (400 mg/kg) and ibuprofen (300 mg/kg) induced gastric ulcers in albino Wistar rats. In aspirin-induced gastric ulcer model, the treatment of melatonin (20 mg/kg), CoQ10 (100 mg/kg) and rabeprazole (20 mg/kg) for 10 days significantly reduced the ulcer index with the values of 1.333 ± 0.30, 1.250 ± 0.2 and 0.916 ± 0.18 respectively whereas the ulcer index of combination treatment of melatonin with rabeprazole and CoQ10 with rabeprazole for 10 days was found to 0.416 ± 0.12 and 0.250 ± 0.11 respectively compared with control wherein the ulcer index was 2.88 ± 0.16. In ibuprofen induced gastric ulcer model, the treatment of melatonin (20 mg/kg), CoQ10 (100 mg/kg) and rabeprazole (20 mg/kg) for 10 days significantly reduced the ulcer index with the values of 1.500 ± 0.21, 1.417 ± 0.15 and 0.833 ± 0.27 respectively whereas the ulcer index of combination treatment of melatonin with rabeprazole and CoQ10 with rabeprazole for 10 days was found to 0.583 ± 0.20 and 0.333 ± 0.10 respectively compared with control wherein the ulcer index was 2.500 ± 0.34. The combination treatment of rabeprazole with melatonin and rabeprazole with CoQ10 has shown better gastroprotective effect compared to rabeprazole alone. Treatment of CoQ10 with rabeprazole showed more gastroprotection than the treatment of melatonin with rabeprazole in both aspirin and ibuprofen induced gastric ulcers.

INTRODUCTION: Gastric ulcer is still the most prevalent cause of gastrointestinal diseases around the world. It is estimated that about 14.5 million people worldwide develop ulcers in some stage of life with a mortality rate of more than 4 million people annually. A peptic ulcer is a disease characterized by the disruption of the mucosal integrity of the esophagus, stomach and duodenum.

QUICK RESPONSE CODE

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Stress, nutritional disorders, alcohol consumption, prolonged use of non-steroidal anti-inflammatory drugs (NSAIDs), and glucocorticoids are followed by gastric complications, including stomach ulcers [1]. The pathophysiology involves an imbalance between offensive (acid-pepsin secretion, alcoholic beverages, NSAIDs use and *Helicobacter pylori* infection) and defensive factors (mucus secretion, blood flow, prostaglandin, bicarbonate, nitric oxide, sulfhydryl compounds and epidermal growth factors). Furthermore, reactive oxygen species (ROS) and lipid peroxidation are involved in the etiology of gastric mucosal lesions [2].

Different medications among which are antacids, antibiotics, proton pump inhibitors, other

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UV SPECTROPHOTOMETRIC METHOD DEVELOPMENT AND VALIDATION OF DAPSONE IN BULK AND GEL FORMULATION

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ABSTRACT

Objective: A new, simple, sensitive, precise and reproducible UV spectroscopic method was developed for the estimation of Dapsone in bulk and gel formulation. **Methods:** The UV spectrum of Dapsone in methanol: water (30:70) showed λ max at 254nm. Beer's law is valid in the concentration range of 3-15µg/ml. This method was validated for linearity, accuracy, precision, ruggedness and robustness. **Results:** The method has demonstrated excellent linearity over the range of 3-15µg/ml with regression equation y = 0.065x + 0.0353 and regression correlation coefficient r^2= 0.9991. Moreover, the method was found to be highly sensitive with LOD (0.519µg/ml) and LOQ (1.729µg/ml). **Conclusion:** Depending on results the given method can be successfully applied for assay of dapsone in gel formulation.

KEYWORDS

Dapsone, UV spectroscopy, Method development, Validation, Methanol: Water (30:70) and Dapsone gel.

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INTRODUCTON

Acne is caused by the effects of hormones on the pilosebaceous unit consisting of a hair follicle and sebaceous gland. The normal skin follicles are blocked by the overgrowth of bacteria[1].

Dapsone is used to treat dermatitis, malaria, and leprosy. Dapsone inhibits the synthesis of dihydrofolic acid by competing with para-aminobenzoate for the active site of dihydropteorate synthetase, thus resembling the action of sulphonamide. It also inhibits the myeloperoxidase-H_2O_2-halide-mediated cytotoxic system in polymorphonucleocytes. Myeloperoxidase covert hydrogen peroxide into hypochlorous acid (HOCl)

Int J Curr Pharm Res, Vol 12, Issue 2, 104-107 Original Article

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DEVELOPMENT AND VALIDATION OF UV SPECTROPHOTOMETRICMETHOD FOR QUANTITATIVE ESTIMATION OF GLIPIZIDEIN PHARMACEUTICAL DOSAGE FORM

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ABSTRACT

Objective: The present work is aimed to develop a simple, rapid, selective and economical UV spectrophotometric method for quantitative determination of Glipizideinbulk and pharmaceutical dosage form.

Methods: In this method Dimethyl Form amide (DMF) was used as solvent, the absorption maxima was found to be275 nm in DMF. The developed method was validated for linearity, accuracy, precision, ruggedness, robustness, LOD and LOQ in accordance with the requirements of ICH guideline.

Results: The linearity was found to be 10-60 µg/ml having linear equation y=0.017x-0.006 with correlation coefficient of 0.997. The% recovery was found to be in the range of 98.7-100%. The % RSD for intra-day and inter-day precision was found to be 0.569923 and 0.40169 respectively. The limit of detection (LOD) and limit of quantification (LOQ) was found to be3.06 µg/ml and 9.27 µg/ml respectively.

Conclusion: The developed method was validated as per ICH Q2(R1) guidelines. The novel method is applicable for the analysis of bulk drug in its pharmaceutical dosage form.

Keywords: Glipizide, UV-Spectrophotometric method, Method Development and validation, Dimethyl Form amide

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INTRODUCTION

Glipizide(1-cyclohexyl-3-[[4-[2-[[(5-methylpyrazine-2-yl) carbonyl] amino] ethyl] phenyl] sulphonyl] urea),[1]is a second-generationsulfonyl urea derivative that is widely used as oral antihyperglycemic drug for the treatment non-insulin dependent diabetes mellitus [2-6].

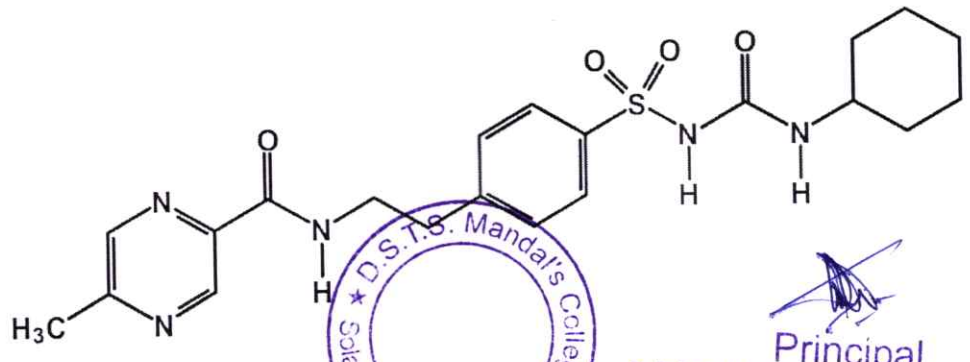

Fig. 1: Structure of glipizide

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Research Article

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UV SPECTROPHOTOMETRIC ANALYSIS AND VALIDATION OF BENZOYL PEROXIDE IN SOLID DOSAGE FORM

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ABSTRACT

Objectives: A new, economical, sensitive, simple, rapid UV spectrophotometric method has been developed for the estimation of Benzoyl peroxide in pure form and pharmaceutical formulation. **Method:** This UV method was developed using methanol as a solvent. In the present method the wavelength selected for analysis was 245nm. UV-Visible double beam spectrophotometer (Systronic 2201) was used to carry out spectral analysis. The ICH guidelines were used to validate the method. **Results:** The method was validated for linearity, range, accuracy, precision, robustness, LOD and LOQ. Linearity was found in the range of 5-25µg/ml. Accuracy was performed by using recovery study. The amount of drug recovered was found to be in the range of 100.1-100.5%. The % RSD value was found to be less than 2. **Conclusion:** The proposed UV spectroscopic method was found to be accurate, precise, stable, linear, specific, and simple for quantitative estimation of benzoyl peroxide in bulk and pharmaceutical dosage form. Hence the present UV spectroscopic method is suitable for routine assay of Benzoyl peroxide in bulk and pharmaceutical formulations.

KEYWORDS

Benzoyl peroxide, UV-Visible spectrophotometric method and Method validation.

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INTRODUCTON

One of the most frequently employed techniques in pharmaceutical analysis is UV-Visible spectrophotometry. The amount of ultraviolet or visible radiation absorbed by a substance in a solution is measured by UV spectrophotometer[1].

Benzoyl peroxide used as a medication to treat mild to moderate acne. It has three-fold activity in treating acne. I.e. sebostatic, comedolytic, and inhibits growth of *C. acnes*. Its molecular formula is

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UV SPECTROPHOTOMETRIC METHOD DEVELOPMENT AND VALIDATION OF IMATINIB IN BULK AND SOLID DOSAGE FORM

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ABSTRACT

Objective: A new, simple, sensitive, precise and reproducible UV spectroscopic method was developed for the estimation of Imatinib in bulk and solid dosage form. **Methods:** The UV spectrum of Imatinib showed λ max at 274nm. Beer's law is valid in the concentration range of 4-20µg/ml. This method was validated for linearity, accuracy, precision, ruggedness and robustness. **Results:** The method has demonstrated excellent linearity over the range of 4-20µg/ml with regression equation y = 0.504x + 0.0014and regression correlation coefficient r^2= 0.9993. Moreover, the method was found to be highly sensitive with LOD (0.68µg/ml) and LOQ (2.06µg/ml). **Conclusion:** Depending on results the given method can be successfully applied for assay of Imatinib in Veenat capsule.

KEYWORDS

Imatinib, Methanol, UV spectroscopy, Method development and Validation and Imatinib Capsule.

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INTRODUCTON

Imatinib is anticancer medicine. Malignancy is a group of sicknesses including irregular cell development with the possibility to attack or spread to different pieces of the body. Imatinib is a protein tyrosine kinase inhibitor that represses Bcr-Abltyrosine kinase. Imatinib restrains profiliration actuates apoptosis in Bcr-Ablpositive cell lines just as new leukemic cells from Philadelphia chromosome positive incessant myeloid leukemia. Unequivocally imatinib is used for unremitting myelogenous leukemia (CML) and extreme lymphocytic leukemia (ALL) that are Philadelphia chromosome-positive (Ph), specific sorts of

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Original Article

UV SPECTROPHOTOMETRIC ANALYSIS AND VALIDATION OF ACYCLOVIR IN SOLID DOSAGE FORM

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ABSTRACT

Objective: A new, economical, sensitive, simple, rapid UV spectrophotometric method has been developed for the estimation of Acyclovir in pure form and pharmaceutical formulation.

Methods: This UV method was developed using distilled water as a solvent. In the present method, the wavelength selected for analysis was 254 nm. UV-Visible double beam spectrophotometer (Systronic 2201) was used to carry out the spectral analysis. The ICH guidelines were used to validate the method.

Results: The method was validated for linearity, range, accuracy, precision, robustness, LOD and LOQ. Linearity was found in the range of 5-30µg/ml. Accuracy was performed by using a recovery study. The amount of drug recovered was found to be in the range of 100.1-100.5 %. The % RSD value was found to be less than 2.

Conclusion: The proposed UV spectroscopic method was found to be accurate, precise, stable, linear, specific, and simple for quantitative estimation of acyclovir in bulk and pharmaceutical dosage form. Hence the present UV spectroscopic method is suitable for the routine assay of acyclovir in bulk and pharmaceutical formulations.

Keywords: Acyclovir, UV-Visible spectrophotometric method, Method validation

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INTRODUCTION

One of the most frequently employed techniques in the pharmaceutical analysis is UV-Visible spectrophotometry. The amount of ultraviolet or visible radiation absorbed by a substance in a solution is measured by UV spectrophotometer [1].

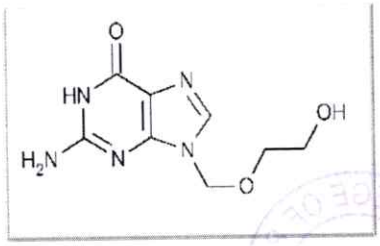

Fig. 1: Chemical structure of acyclovir [2]

Acyclovir is also known as Aciclovir (ACV). Its molecular formula is $C_8H_{11}N_5O_3$. IUPAC name of acyclovir is 2-amino-9-[(2-hydroxy-ethoxy) methyl]-6, 9-dihydro-3H-purin-6-one (fig. 1). It is a nucleotide analog antiviral primarily used for the treatment of herpes simplex virus infections2 [3]. Acyclovir is converted into acyclovir monophosphate due to the action of viral thymidine kinase then it is converted into acyclovir triphosphate (ACV-TP) by the action of host cell kinase [4]. ACV-TP competitively inhibits and inactivates the action of DNA polymerases by preventing further synthesis of viral DNA without affecting the cellular processes [5].

MATERIALS AND METHODS

Instruments

UV/Visible double beam spectrophotometer Systronic 2201. Standard cuvettes having 10 mm of path length are used for analysis. Ultrasonicator (micro clean-103) was used to sonicate the formulation sample. Drug sample was weighed by using an electronic analytical balance (Shimadzu AY220).

Chemicals and reagents

Active pharmaceutical ingredient of Acyclovir is gifted as a sample from Aadhaar Life Sciences Pvt. Ltd. Solapur. Marketed formulation of Acyclovir was procured from the local pharmacy.

Experimental work

Method development

Preparation of standard stock solution of acyclovir

10 mg of standard drug Acyclovir was accurately weighed and transferred into 10 ml volumetric flask and a sufficient amount of water was added into it and sonicated for 5 min, finally, volume was made up to the mark with the same solvent to make 1000µg/ml stock solution. From this 1 ml was again diluted to 10 ml to get a concentration of 100µg/ml of Acyclovir. From 100µg/ml solution 5 ml was again diluted to 10 ml to get a concentration of 50µg/ml.

Selection of wavelength

To determine the wavelength for measurement, Acyclovir (50µg/ml) solution was scanned in the range of 200-400 nm against distilled water as blank. Wavelength of maximum absorption was determined for the drug. Acyclovir showed maximum absorption at 254 nm.

Assay of acyclovir tablet

20 tablets weighed and powdered. The powder equivalent to 10 mg of acyclovir was weighed, transferred into 10 ml volumetric flask and dissolved in water. This solution was sonicated for 15 min and the final volume was made up to the mark with water. 1 ml of solution was transferred into 10 ml volumetric flask and diluted up to 10 ml with water. The absorbance of this solution was measured at 254 nm.

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SIMPLE UV SPECTROPHOTOMETRIC METHOD FOR THE DETERMINATION OF FLUVASTATIN

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Abstract:

Objective: To determine the Statin (Fluvastatin) in pure form simple and cost effective spectrophotometric method was developed.

Methods: The UV spectrum of Fluvastatin in DMF showed absorption maximum at 304 nm and obeys Beer's law in the concentration range 5-30 µg/ml. The absorbance was found to be increases concentration with increasing linearity which is calculated by correlation coefficient value of 0.998. This method was validated for the accuracy, linearity, precision, ruggedness and robustness.

Results: The method has demonstrated excellent linearity over the range of 5-30 µg/ml with regression equation y = 0.022x + 0.053 and regression coefficient r^2 = 0.998. Furthermore, the method was found to be highly sensitive with LOD (1.501µg/ml) and LOQ (4.550µg/ml)

Conclusion: On the basis of the results, this method was successfully applied for the assay of Fluvastatin in different pharmaceutical dosage forms.

Keywords: Fluvastatin, Spectrophotometry, Dimethyl formamide, validation.

INTRODUCTION

Lipid and lipoproteins abnormalities are regarded as highly risk factor for influence of cholesterol, raised cholesterol increases the risk of heart diseases and stroke. Presence of abnormal levels of lipids in the blood causes disease like hyperlipidemia or hyperlipoproteinemia. Fluvastatin has been shown to reduced the cholesterol and prevent the coronary events in patients with heart disease. Fluvastatin reduces total cholesterol, LDL cholesterol hence, it is used as a treatment in homozygous and heterozygous familial hypercholesteremia also it is used in non-familial and mixed dyslipidemia. Other than this fluvastatin also lowers the high levels of VLDL cholesterol and triglyceride. Fluvastatin calcium a synthetics lipid lowering agent shows its therapeutic effects by competitive inhibition of 3-hydroxy - 3methyl glutrtyl CoA.[1,2,3] More than a few analytical methods have been reported for the estimation of Fluvastatin such as only some chromatographic method[4,5] , spectrophotometric method[6,7], capillary electrophoresis (CE)[8,9,10] is one of the method and electrochemical as differential pulse voltammetry (DPV)[11] .

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Design and Characterization of Nanocrystals of Quercetin for Solubility and Dissolution Enhancement

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ABSTRACT

In the pharmaceutical formulation water solubility is most affecting property to the stability and bioavailability of drug. If the drug is insoluble in both aqueous and organic solvents then it is very difficult to deliver the drug in a sufficiently bioavailable form. Although some approaches are available to increase the bioavailability of poorly soluble drugs having drawbacks like not only low drug loading but also the large doses hence, it is a challenge to formulation researcher to overcome such problems. Nanonisation is one of the solution to poorly soluble drugs. It leads the solubility and more biologically available and safer dosage form of poorly soluble and bioavailable drugs. Quercetin is also a water insoluble drug with low bioavailability hence; in the present study by using anti-solvent precipitation method nanocrystals were formulated. Then the prepared nanocrystals are subjected to particle size analysis, FTIR study, X-ray diffraction, DSC, and in-vitro dissolution study. The nanocrystals are possible with less particle size with slightly changes in the crystallinity. It has shown that, drug increases the saturation solubility with enhanced dissolution profile study.

Keywords: **Quercetin, nanocrystals, solubility, anti-solvent, dissolution profile.**

1. INTRODUCTION

Quercetin is a plant flavonol from the flavonoid groups. It has wide range of biological & pharmacological activities such as antitumor [1], antibacterial [2], antioxidant, anti-inflammation [3], obtains protection against osteoporosis, pulmonary & cardiovascular diseases [4]. It is possible to be developed as an active pharmaceutical ingredient (API) for the different formulations, on the other hand its partial use due to poor solubility & low rate of dissolution leading to low bioavailability [5,6].

Most of the drugs demonstrate such low solubility that micronization does not lead to improve the solubility and dissolution rate of the drugs. Due to micronization to nanonization drug nanocrystals gained much more interest to enhance the solubility of drug [7]. By the formulation of nanocrystals particle size reduction is done by nanosizing has been applied to improve the solubility [8,9]. Due to high drug payload capacity, use of minute quantity of excipients, higher chemical stability, lower toxicity, easy scale up and manufacturing nanocrystals gained increased interest to enhance the solubility compare to other nano-particulate system [10]. Drug nanocrystals are 100% drug load capacity with crystalline nanosized particles. They are formulated as a liquid dispersion and contains the raw drug stability with a polymer and surfactant [11,12].

The aim of the present study to decrease the particle size of the drug which is enhances the solubility of the drug with increased solubility. The particle size reduction was done by anti-solvent precipitation method. The solubility study and *in-vitro* dissolution profile of the obtained nanocrystals were compared with the results of pure drug. The polymer used to prepare the nanocrystals is beta-cyclodextrin which is a solubility enhancer. The prepared nanocrystals were evaluated for particle size analysis; solubility study to confirm the increase in solubility of formulation as compared with pure drug, crystalline state was also assayed by using X-ray diffraction study method and dissolution profile study.

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Research Article **ISSN: 2349 – 7106**

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UV SPECTROPHOTOMETRIC METHOD FOR ESTIMATION OF PALIPERIDONE IN BULK AND THEIR SOLID DOSAGE FORM

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ABSTRACT

Objective: The simple, rapid, reproducible, sensitive and economical method of UV Spectrophotometry for the estimation of Paliperidone (PPD) in bulk and its formulation was developed and validated. **Methods:** The UV spectrum of Paliperidone in Dimethylformamide (DMF) showed λ max at 280nm. The linearity was established in the concentration range of 10-60µg/ml for Paliperidone. This method was validated for different analytical parameters such as linearity, accuracy, precision, ruggedness and robustness. **Results:** The method shows approximate linearity over the concentration range of 10-60µg/ml with the regression equation y = 0.0187x - 0.1258 and regression correlation coefficient r^2= 0.999 at 280nm. However, the method was found to be highly precise with LOD (1.82) and LOQ (6.07). **Conclusion:** Considering above results the developed method can be successfully applied for the determination of Paliperidone in different pharmaceutical dosage forms.

KEYWORDS

Paliperidone, Spectrophometry, Dimethylformamide (DMF), Method development and Validation.

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INTRODUCTON

The active metabolite of risperidone is paliperidone which is used in treatment of the schizophrenia. The disease called schizophrenia is a serious mental disorder in which people interpret reality abnormally. The problem associated with it shows hallucinations, delusions, and disordered thinking. To treat this type of disease an anti-psychotic drug are given, whereas the drug called paliperidone itself act as an psychotropic agent which belongs to the chemical class of benzisoxazole derivatives[1]. The chemical name of Paliperidone is (RS) -3- [2-[4-(6-fluoro-1, 2-benzoxazol-3-yl) piperidin-1-yl]ethyl]-9-hydroxy-2-methyl-6, 7, 8, 9-

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FORMULATION AND EVALUATION OF NIFEDIPINE LOADED SOLID LIPID NANOPARTICLES

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ABSTRACT

The objective of the research work is to enhance the solubility and dissolution rate of Nifedipine by converting them into suitable solid lipid nanoparticles (SLNs). The method used for formulating solid lipid nanoparticles (SLNs) was high pressure homogenization followed by solvent emulsification- ultrasonication. The evaluation parameters for SLNs were drug content, entrapment efficiency, particle size, solubility study, *in vitro* drug release, etc. Nifedipine loaded solid lipid nanoparticles (SLNs) were characterized for drug content, entrapment efficiency, particle size, solubility study and *in vitro* drug release. Nifedipine loaded SLNs was prepared by using stearic acid and glycerylmonostearate as lipid and Tween 80 as stabilizer. The optimized batch (F4) contained 500mg of Glycerylmonostearate and 300mg of stabilizer. Batch F4 exhibited drug content of 88.75±0.510%, %EE of 79.31±0.119%, Particle size of 146±31.2nm, Practical yield of 91±1.21%, Solubility of 0.011mg/ml and % drug release of 71.17% at 180mins. It was concluded that the solid lipid nanoparticles (SLNs) developed by this method showed increase in solubility and dissolution rate of Nifedipine.

KEYWORDS

Solid lipid nanopartilces (SLNs), High pressure homogenization, Solvent emulsification, Nifedipine, Drug release and Solubility study.

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INTRODUCTON

Nifedipine (Dihydropyridine derivative) is calcium channel blocker. It is also a peripheral arterial vasodilator which acts on smooth muscle. It is used in the treatment of angina pectoris and systemic hypertension[1]. Nifedipine is a BCS class II drug with elimination half-life of about 2-4hrs. It shows 45-56% of oral bioavailability because of hepatic first pass metabolism. Rate limiting step in absorption of Nifedipine from gastrointestinal tract

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Int J Curr Pharm Res, Vol 12, Issue 2, 68-71 Original Article

SPECTROPHOTOMETRIC DETERMINATION OF DASATINIB IN PHARMACEUTICAL FORMULATIONS

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ABSTRACT

Objective: A new, simple, sensitive, precise and reproducible bioanalytical method was developed for the determination of Dasatinib in pharmaceutical formulations with Chloranilic acid.

Methods: The method is based on formation of violet colored complex. The UV spectrum of Dasatinib in methanol showed λ max at 521 nm. Beer's law is valid in the concentration range of 10-60 µg/ml. This method was validated for linearity, accuracy, precision, ruggedness and robustness.

Results: The method has demonstrated excellent linearity over the range of 10-60 µg/ml with regression equation y = 0.021x-0.083 and regression correlation coefficient r^2= 0.997. Moreover, the method was found to be highly sensitive with LOD (2.96µg/ml) and LOQ (8.98µg/ml).

Conclusion: Based on results the proposed method can be successfully applied for the assay of Dasatinib in various pharmaceutical dosageforms.

Keywords: Dasatinib, Bioanalytical method, Spectrophotometry, Chloranilic acid, Method development, Validation

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INTRODUCTION

Cancer is an abnormal, continuous multiplying of cells. The cells divide uncontrollably and may grow into adjacent tissue or spread to distant parts of the body [1].

Dasatinib is an anticancer agent which is given orally to treat the chronic myeloid leukemia and acute lymphoblastic leukemia. Specifically it is used to treat cases that are Philadelphia chromosome-positive (Ph+). It is classified as a kinase inhibitor. The main action of kinase inhibitors is to prevent the growth of tumors by the action of reducing the activity of proteins that controls growth, cell division and survival. Dasatinib was approved for medical

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Int J Curr Pharm Res, Vol 12, Issue 3, 130-132 Original Article

FORMULATION AND EVALUATION OF CRACK CREAM FROM PLANT EXTRACTS

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ABSTRACT

Objective: The main aim of our research was to develop an anti-cracked heels cream formulation consisting of Hedychium Spicatum, Aloe barbadensis, Azadirachta indica for the treatment of cracked heels.

Methods: An anti-cracked heels cream formulation consisting of Hedychium Spicatum, Aloe barbadensis, Azadirachta indica extracts was prepared. Microbiological studies were performed the safety of materials used in the formulation.

Results: The developed cream consisting of Hedychium Spicatum, Aloe barbadensis, Azadirachta indica was found to be safe and effective for the treatment of cracked heels.

Conclusion: It can be concluded that herbal creams without side effects having anti-inflammatory property can be used as the provision of a barrier to protect the skin.

Keywords: Hedychium Spicatum, Aloe barbadensis, Azadirachta Indica

DOI: http://dx.doi.org/10.22159/ijcpr.2020v12i3.38322. Journal homepage: https://innovareacademics.in/journals/index.php/ijcpr

INTRODUCTION

The skin on the feet tends to become drier as there are no any oil glands present. This dryness causes the skin to crack. Lack of moisturization, over exposure to pollution and a few medical conditions like eczema, diabetes, thyroid, and psoriasis cause dry and cracked feet. Hedychium spicatum Buch Ham (Family: Zingiberaceae) is commonly known as Spiked ginger lily, has a rich history of use in India. It is a perennial rhizomatous herb, commonly found in Himalayas at altitudes 3500-7500 ft. It has been valued in the Traditional. The rhizome extract has been reported to contain resins, saccharides, albumen volatile oil, starch, organic acids and glycosides. This has been advocated for blood purification and coverings of bronchitis, indigestion, eye disease and inflammations. A number of beneficial effects of burn plants are reported, including wound and burn healing, antifungal, and anti-inflammatory properties.

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Original Article

FORMULATION AND EVALUATION OF MICROEMULSION CONTAINING NEEM SEED OIL

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ABSTRACT

Objective: The objective of the present study was to formulate Microemulsion containing seed oil. Neem seed (Azadirachtaindica) oil was extracted from its seeds by the soxhlet apparatus. Acetone is used as a solvent. PEG 400 and Carbopol 940p was select as surfactant, co-surfactant and hydrogel thickening agent. Microemulsions were characterized for pH, viscosity, spreadability, *in vitro* drug transport study and *in vivo* antibacterial activity and shows satisfactory results. Antibacterial activity of formulation against E. coli Shows at a concentration of 3%. The neem seed oil microemulsion has the potential for antibacterial activity.

Methods: A ratio of surfactant and cosurfactant i.e, S/CoSchoosen and corresponding mixture was made. The mixture was mixed with oil. Each mixture was mixed thoroughly using magnetic stirrer until homogenous dispersion/solution was obtained. Double distilled water was used in this formulations as to prevent the incorporation of surface active impurities. The mixture was titrated with water and ambient temperature with constant stirring at the endpoint where the mixture become clouded, the quantity of aquous phase added. The percentage of three different pseudo-phases incorporated were calculated.

Results: Solubility studies in various solvents reveals that the oil is insoluble in distilled water and ethanol. Soluble in methanol.

Conclusion: It was observed that the microemulsion having multilamellar nature. Batches with carbopol shows better homogenous distribution. The stability of microemulsion prepared with carbopol 71 was gretter than with xanthan gum. The *in vitro* study of microemulsion was performed and Batch (F7) is optimized batch which shows highest drug release.

Keywords: Neem seed oil, Microemulsion, Topical application, Antibacterial activity

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INTRODUCTION

Microemulsions are thermodynamically stable isotropically clear dispersion of two immiscible liquids, like oil and water, stabilized by an interfacial film of surfactant molecules, with a size range of 5-200 nm and have very low interfacial tension [1]. Microemulsions could be an alternative carrier in topical drug delivery and as it has high Solubilization capability and nanometer size, it is believed that microemulsion will be a better candidate in delivering drug topically. They are composed of surfactant, water, and oil having co-surfactants provide better therapeutic action when compared to the traditional cream and lotions [2].

It is a topical delivery in skin, which makes the drug delivery difficult. This factor is consideration of preparation of micro-emulsions which have low skin irritation, high drug loading capacity, It reduce the diffusion barrier of corneum by dissolving the lipids in the Stratum corneum and enhancing the permeation of drug [3].

Traditionally neem seed oil and leaves used as insect repellent and as pesticides. Neem oil containing Azadirachatin could be used in hair care formulation due to their antiheadche, antidandruff, and antifungal properties [4]. Almost all parts of neem have been used as traditional Ayurvedic, in unani, and siddha medicine in india. Neem oil is used to control various skin infections [5].

The aim of the present study is to formulate topical microemulsion using Neem seed oil, tween 80, PEG 400, xanthan gum, carbopol 940. Tween 80 is a non-ionic, non-toxic surfactant that is not affected by change in pH. The antibacterial efficacy of the formulated microemulsion is additionally investigated.

MATERIALS AND METHODS

Table 1: List of chemicals

S. No.	Chemical	Manufacturer/Provier
1	Neem seed oil	Pradip aggrotech pvt. ltd
2	Tween 80	Lab grade
3	Propylene Glycol 400	Lab grade
4	Carbopol 71	Lab grade
5	Xanthan gum	Lab grade
6	Ethanol	Lab grade

Extraction of neem seed oil [6]

Neem seeds were washed three times thoroughly till no dust or other impurities left. Neem seeds were heated in a temp of 50 °C for one hour so they would dry out so kernels can be separated from wooden parts of seeds. The kernels were grounded using grinder. Soxhlet apparatus used for the extraction of neem seed oil. The kernel powder was placed into the soxhlet apparatus. Acetone is used as solvent in the ratio of 1:5 (W/V). The solvent was hated at 50 °C for eight hours so no oil left in the neem kernel. Then the

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Original Article

FORMULATION AND EVALUATION OF LIPOSOMAL GEL CONTAINING EXTRACT OF PIPRINE

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ABSTRACT

Objective: The objective of present research work is to develop Liposomes as a carrier system for 70% Hydroalcoholic extract, its incorporation in to gel formulations and to characterize the prepared and develop Liposomal gel formulation. There are many reports revealing the pharmacological potential of *Piper Nigrum.*

Methods: Cholestrol in various weight ratios were dissolved in 10 ml of Methanol: Chloroform (1:1) ratio used as a solvent. The extract solution was taken in a 500 ml round bottom flask. The flask was rotated in rotary flash evaporator at 40 rpm for 20 min in the thermostatically controlled water bath at 40 °C under vacuum 240 mmHg. The solvent was slowly removed by this process, and a very thin film of dry lipids was formed on the flask. The dry lipid film was slowly hydrated with 10 ml of Saline Phosphate Buffer pH 7.4 containing Insulin Drug. The flask was once again rotated at the same speed as before and at room temperature for 2 hr. The liposomal was left to overnight at 4°C, full lipid hydration.

Results: This study was done for herbal formulations used for topical delivery of therapeutic agents at the time of injury to accelerate skin repair in the shortest time possible, with minimal pain. Plant *Piper Nigrum.* Family Piperaceac is extensively used.

Conclusion: The present study revealed liposomal gel as an efficient carrier for herbal extract. Keywords: Piperine, Gel, Herbal extract, Liposomes, Liposomal gel.

Keywords: Liposomal gel, Containing extract of piprine

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INTRODUCTION [1, 2]

Liposomes have been investigated for many years as parenteral drug carrier systems, but only for approximately one decade, they have been considered for topical drug delivery, including ophthalmic and dermal treatments. With regard to the topical application, liposomes embedded in the topical dosage forms could provide a topical activity at the desired locus of action with little or no systemic activity. In general, they are deemed more effective and less toxic than conventional topical formulations, ointments, creams or lotions. Liposomal topical formulations may serve as a solubilizing matrix for poorly soluble drugs, penetration enhancers of the active ingredient into the skin, local depot (microreservoires) for sustained drug release as well as a rate-limiting membrane barriers for modulation of systemic absorption. In accordance to the abovementioned, local anesthetics together with anticancer, antifungal and antibiotic agents are among the substances whose incorporation into liposomes satisfied all the requirements necessary for topical application and localized drug delivery.

Vitiligo is known in Ayurveda as "*shwitra*". It is of twotypes, that is, *Kilas* and *Varuna.*

Medical and surgical treatments for vitiligo are suboptimal witheither poor response or continued the progression of vitiligo despite therapy. As far as medical therapies are considered, high potency topical steroids and narrowband ultraviolet irradiation are considered to be the effective form of monotherapy as per current evidence.

MATERIALS AND METHODS

Materials

Cholesterol, Methanol, Cabopol 940, PEG 400, Methylparaben, Proplyparaben and Cows Ghee, Chloroform, Dichloromethane were purchased from local market. The extraction was carried out by using dried seed of Black Paper In hydroalcohol solution.

Collection of seed material

The seed of Black Paper were collected from the Local market, Solapur, Dist.-Solapur, Maharashtra, India in Augest 2019, cleaned and used.

Authentication of plant

The seeds authenticated by Dr. M. N. Jagtap, HOD, Dept. of Botany, DBF Dayanand College of Arts and Science, Solapur. By comparing morphological features and a sample voucher of specimens having the cat. No. 9201

Preparation of extract [3]

100 gm of black pepper powder extracted with 1500 ml 95% ethanol in Soxhlet extractor for 2 h. The solution was filtered and concentrated on the water bath at 60 °C. 10 ml 10% of alcoholic potassium hydroxide was added to the filtrate with continuous stirring. The residue was filtered and alcoholic solution was left overnight and filtered through a membrane filter.

Calibration curve

10 mg of extract powder was accurately weighed and transferred to 10 ml clean and dry volumetric flask and phosphate buffer pH 5.8 was added in volumetric flask volume was adjusted to 10 ml to give the concentration of 1000µg/ml. from this 4 ml was pipetted out and transferred to another 10 ml clean and dry volumetric flask and volume was adjusted to 10 ml with phosphate buffer pH 5.8 to give the concentration of 400µg/ml. from this stock solution 0.5 ml,1 ml, 1.5 ml, 2 ml and 2.5 ml solution was pipetted out to give the concentration of 20,40,60,80 and 100µg/ml. the absorbance was measured at 243 nm and the calibration curve was plot.

Preparation of liposome by rotary flash evaporator method

Ghee: Cholestrol in various weight ratios were dissolved in 10 ml of Methanol: Chloroform (1:1) ratio used as solvent. The extract solution was taken in a 500 ml round bottom flask. The flask was rotated in rotary flash evaporator at 40 rpm for 20 min in thermostatically controlled water bath at 40 °C under vacuum 240 mmHg. The solvent was slowly removed by this process and very thin film of dry lipids was formed on the flask. The dry lipid film was slowly hydrated with 10 ml of Saline Phosphate Buffer pH 7.4 containing Insulin Drug. The flask was once again rotated at the

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UV SPECTROPHOTOMETRIC METHOD DEVELOPMENT AND VALIDATION FOR DETERMINATION OF ONDANSETRON HYDROCHLORIDE IN BULK AND FORMULATION

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ABSTRACT

UV Spectrophotometric Method Development and Validation for quantitative estimation of Ondansetron Hydrochloride (OND). UV Spectrophotometric method has been widely employed in the determination of individual components in a mixture of fixed-dose combinations. We aim to develop a spectroscopic method for estimation of the Ondansetron HCL in ternary mixture by using UV spectrophotometry. The method was validated as per ICH guidelines. The drug obeyed Beer's law and showed a good correlation. It showed absorption maxima at 309 nm in simulated saliva. The recovery studies confirmed the accuracy and precision of the method. It was successfully applied for the analysis of the drug in bulk and could be effectively used for routine analysis.

KEYWORDS: UV spectrophotometry, Ondansetron hydrochloride, Simulated saliva, Tablets.

INTRODUCTION

Ondansetron hydrochloride, chemically 4Hcarbazol- 4-one-1, 2, 3, 9-tetrahydro-9-methyl-3-[(2-methyl-1H-imidazole-1-yl) methyl] hydrochloride is selective 5-HT_3 antagonist. It acts both, peripherally on vagal nerve terminals and centrally in the chemoreceptor trigger zone of the area postrema. It is indicated for the prevention of nausea and vomiting associated with cancer chemotherapy, radiotherapy, or anesthesia and surgery. It is penicillinase-resistant penicillin, used in the treatment of bacterial infections such as pneumonia and bone, ear, skin,

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METHOD DEVELOPMENT AND VALIDATION OF AMOROLFINE IN BULK AND ITS SEMISOLID DOSAGE FORM BY VISIBLE SPECTROPHOTOMETRY

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ABSTRACT

Objective: The present study was undertaken to develop a rapid simple specific accurate, precise, robust and economic visible spectrophotometric method for determining the Amorolfine in semisolid dosage form. **Method:** The Visible spectrophotometric method was performed at maximum wavelength 542nm by using Methanol and DMF as a solvent. The nethod was validated by following the analytical performance parameter suggested by ICH which include accuracy, precision, linearity, robustness, LOD, LOQ and Specificity. **Result:** The drug obeys the beer's lamberts law in the concentration range of 10-60µg/ml. It exhibits the good coefficient correlation (0.9992) and excellent mean recovery. The % recovery for precision was found within limit i.e. less than 2% and accuracy gave results within limit i.e. 97-103%. The developed method was suitable and specific to analysis of Amorolfine even in the presence of excipients. **Conclusion:** The obtained results proved that the validated method can be employed for routine analysis of Amorolfine in bulk as well as in the Cream.

KEYWORDS

Amorolfine, Chloranillic acid, Methanol, DMF, Visible Spectrophotometry, Method development and Validation.

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INTRODUCTON

Visible Spectroscopy is most widely used method in the analytical chemistry. It is also called as colorimetry. Amorolfine is used as a morphine antifungal agent that inhibit the fungal enzymes D14 reductase and D7-D8 isomerase. This inhibition affects fungal sterol synthesis pathway, by depletingergosterol and causing ignosterol to accumulate in the fungal cytoplasmic membrane[1-2]. Amorolfine is Soluble in methanol, ethanol, DMF and DMSO. IUPAC name of Amorolfine is (2R,6S)

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Original Article

VISIBLE SPECTROPHOTOMETRIC METHOD DEVELOPMENT AND VALIDATION OF IMATINIB IN BULK AND FORMULATION

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ABSTRACT

Objective: A new, simple, sensitive, precise and reproducible UV visible spectrophotometric method was developed for the determination of Imatinib in pharmaceutical formulations with alizarin.

Methods: The method is based on formation of yellow-colored complex. The UV spectrum of Imatinib in methanol showed λ max at 431 nm. Beer's law is valid in the concentration range of 10-70 µg/ml. This method was validated for linearity, accuracy, precision, ruggedness and robustness.

Results: The method has demonstrated excellent linearity over the range of 10-70 µg/ml with regression equation y =0.013x-0.017 and regression correlation coefficient r^2= 0.997. Moreover, the method was found to be highly sensitive with LOD (4.3µg/ml) and LOQ (13.07µg/ml).

Conclusion: Based on results the proposed method can be successfully applied for the assay of Imatinib in various pharmaceutical dosage forms.

Keywords: Imatinib, Spectrophotometry, Alizarin, Method Development, Validation

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INTRODUCTION

Cancer is an abnormal growth of cell which tends to proliferate in an uncontrolled way and in some cases metastasize. It is the common cause of mortality [1].

Imatinib is an anticancer agent used to treat leukemia. Specifically, it is used for chronic myelogenous leukemia (CML) and acute lymphocytic leukemia (ALL), certain types of gastrointestinal stromal tumors (GIST), chronic eosinophilic leukemia. Specifically, Philadelphia chromosome-positive (Ph+) [2-5].

The activity of tyrosine kinase i.e. multiplication of cell is blocked by Imatinib. This will lead to a stoppage of the spreading of cancer cell [6-8]. The United states approved Imatinib as medical use in 2001. It is also included in the World Health Organization List of Essentials Medicines, the most effective and safe medicines needed in a health system. Imatinib was drug to be pushed for approval of designation by FDA [9-13].

Structure of imatinib

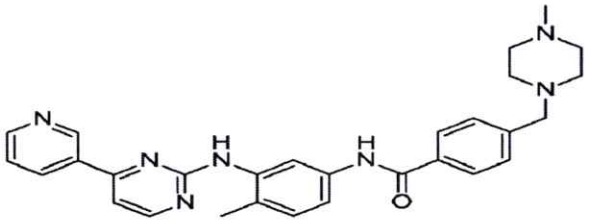

Fig. 1: The Chemical name of Imatinib is α-(4-methyl-1-piperazinyl)-3 [4-(3-pyridyl)-2-pyrimidinyl)-p-toluidide. The molecular formula of Imatinib is $C_{29}H_{31}N_7O$ and molecular weight is 493.603 gm/ml. Imatinib is white powder and has melting point 214 °-224 °C. It is freely soluble in distilled water and methanol [14-17]

The aim of this work is to introduce a simple, precise and rapid procedure for the simultaneous quantitation of the cited drug in plasma and pharmaceutical formulation.

MATERIALS AND METHODS

Materials

Imatinib was taken as a gift sample from Microlab, Bengaluru, India. Alizarin, Methanol and Dichloromethane were used were of analytical grade.

Instruments

A UV visible single beam spectrometer [systronics 119] and Shimadzu 1800-UV spectrophotometer with 1 cm quartz cuvettes were used for all absorbance measurement.

All weights were taken on an analytical balance (Shimadzu AY220). Sonicator was used for dissolving Imatinib in methanol.

Experimental

Preparation of alizarin

Alizarin 0.1 % (w/v) was dissolved in the least amount of methanol and completed to the required volume using dichloromethane.

Preparation of standard stock solution

Accurately weighed 10 mg of Imatinib transferred to 100 ml volumetric flask. It was dissolved in methanol and sonicated for 10 min. The volume was made up to mark with methanol to obtain final strength.

Procedure for plotting a calibration curve

Into a series of 10 ml volumetric flasks, 1-7 ml of standard solution was pipetted out separately and to each flask, 1 ml of 0.1 % alizarin was added. The volume was completed to the mark using methanol. The developed yellow color was measured at wavelength 431 nm against blank solution prepared in a similar manner excluding a drug.

Analysis of imatinib in pharmaceutical dosage form

20 Capsules containing Imatinib were weighed. An accurately weighed portion of the powder equivalent to 10 mg of Imatinib was dissolve in a 100 ml of methanol and mixed for about for 5 min and sonicated for about 10 min then filtered. From formed solution with a concentration of 100µg/ml seven aliquots were pipetted out into a

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RESEARCH ARTICLE

Formulation and Evaluation of Neem extract hand Sanitizer

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ABSTRACT:

Objective: The present research has been undertaken for the formulation and evaluation of neem Extract of hand sanitizer. It is used for topical use for the local anaesthetic activity. **Methods:** Carbopol 934 was used as a polymer in various batches. The ratio of Carbopol 934 was changed for various batches. Developed Formulations of Physicochemical parameters such as percentage yield, drug content, pH, Viscosity, Spreadability, Extrudability and In-vitro Diffusion study were carried out for developed batches of Neem extract. **Results:** Viscosity studies of various formulations Exhibited that Formulation F3 was better than that of F1 and F2. From among all the developed formulation, F3 Shows better rheological properties and excellent Extrudability. pH of the F3 Batch is Sufficient to treat the bacteria. Percentage yield and drug content of F3 batch is better than other batches. Results shows that the concentration of Carbopol 934 gives the good rheological properties and drug contents. In-vitro Diffusion studies were carried out, F3 batch shows better results than that of the other two batches i.e. 99.06%. **Conclusion:** It was concluded that F3 batch is the better than that of other batches. So F3 batch is better for the topical use.

KEYWORDS: Neem extract, Hand sanitizer, Alcohol, Formulation, Evaluation.

INTRODUCTION:

Hand sanitizer is a liquid or gel generally used to decrease infectious agents on the hands. They are available as liquids, gels, and foams. Formulations of alcohol-based versions are preferable to hand washing with soap and water in most situations in the healthcare setting. Generally, it is more effective at killing microorganisms than soap and water, with some exceptions such as norovirus and clostridium difficile The general use of non-alcohol based versions has no recommendations. Outside the healthcare setting, hand washing with soap and water is generally preferred. Hand washing should still be carried out if contamination can be seen or following the use of the toilet.

Alcohol-based versions typically contain some combination of isopropyl alcohol, ethanol (ethyl alcohol), or n-propanol, with versions containing 60% to 95% alcohol the most effective. Care should be taken as they are flammable. Alcohol-based hand sanitizer works against a wide variety of microorganisms but not spores. Compounds such as glycerol may be added to prevent drying of the skin. Some versions contain fragrances; however, these are discouraged due to the risk of allergic reactions. Non-alcohol based versions typically contain benzalkonium chloride or triclosan; but are less effective than alcohol-based ones.

Alcohol has been used as an antiseptic at least as early as 1363 with evidence to support its use becoming available in the late 1800s. Alcohol-based hand sanitizer has been commonly used in Europe since at least the 1980s. The alcohol-based version is on the World Health Organization's List of Essential Medicines, the safest and most effective medicines needed in a health system. The

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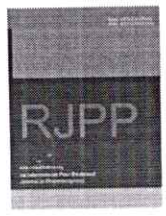

RESEARCH ARTICLE

Antimicrobial Activity and Isolation of Lawsone from *Lawsonia inermis* using Column Chromatography

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ABSTRACT:
Henna is most commonly used for coloring the hair from more than 5000 years. It contains Lawsone which interacts with keratin present in skin and hair by Michael addition which results into permanent stain. Chemically Lawsone is 2-hydroxy-1,4-naphthoquinone found in the leaves of the henna plant as well as in the flower of water hyacinth. But the Lawsone isolation from *Lawsonia inermis* can be difficult due to its easily biodegradable nature. Hence isolation of Lawsone is done by using Column chromatography. The isolated extract was also tested for antimicrobial activity keeping Vancomycin as a standard. It has shown prominent Antimicrobial activity.

KEYWORDS: Lawsone, Henna extract, Antimicrobial Activity, column chromatography.

INTRODUCTION:

Humans have used henna extracts containing lawsone as hair and skin dyes for more than 5000 years. Lawsone reacts chemically with the protein known as keratin in skin and hair, in a process known as Michael addition, resulting in a strong permanent stain that lasts until the skin or hair is shed. The darker colored ink is due to more lawsone-keratin interactions occurring, which evidently break down as the concentration of lawsone decreases and the tattoo fades. Lawsone strongly absorbs UV light, and aqueous extracts can be effective sunless tanning and sunscreens. Chemically, lawsone is similar to juglone, which is found in walnuts.

Lawsone (2-hydroxy-1,4-naphthoquinone), also known as **hennotannic acid**, is a red-orange dye present in the leaves of the henna plant (*Lawsonia inermis*) as well as in the flower of water hyacinth (*Eichhornia crassipes*).

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Lawsone isolation from *Lawsonia inermis* can be difficult due to its easily biodegradable nature.

MATERIALS AND METHODS:

Lawsone was procured from the leaves of Henna from the local garden located in the premises of the Dayanand College of Arts and Science. Methanol and Chloroform were used as solvents in the column chromatography for running process were obtained from Vijaya Chemicals, Solapur.

Isolation of Lawsone:

1. Preparation of Alcoholic Crude Extract:

The leaves of the shed dried henna were powdered well in a mortar. Further this powered Crude drug was added with methanol and incubated at 37°C for 5 days. During this incubation period, the polar as well as non-polar compounds which are to be isolated from *Lawsonia inermis* get separated in the black supernatant in the methanolic crude extract. Once the incubation period was lapsed, the methanolic crude supernatant was separated from the sediment and was allowed to air dry without sunlight to interfere for at least 2 days. Silica gel for Column Chromatography (60-120 Meshed) was used

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FORMULATION AND EVALUATION OF MOUTH DISSOLVING FILM OF TADALAFIL

SHRISHAIL M. GHURGHURE[1], MANISHA S. DYAWARKONDA*[1], VARSHA JAKUNE[1], JYOTI KHADTARE[1], SACHIN YANJANE[1]

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ABSTRACT:

Objective: Mouth dissolving films these are novel dosage forms it comes under fast dissolving drug delivery system. It disintegrates or dissolves within the oral cavity. It does not require water for administration so that it is convenient for medications for the pediatric and geriatric patients which have the difficulty in swallowing. This research work was aimed to enhance the oral bioavailability and provide faster onset of action of Tadalafil by formulating its mouth dissolving film (MDF).

Method: The MDF of Tadalafil was prepared by solvent casting method. Tadalafil it is a BCS class II and it has the oral bioavailability of about 28%. HPMC k-15, Xanthan gum, Sodium alginate (film forming agent), Glycerol (plasticizer), Tween 80 (solubilizing agent), Citric acid (saliva stimulating agent), Sucrose (sweetening agent), vanillin (flavoring agent), Propyl paraben (preservative). The formulation was evaluated for weight variation, thickness, folding endurance, drug content, disintegration time and *in-vitro* dissolution study stability study.

Conclusion: Based on the results F2 was showed enhanced bioavailability and rapid onset of action as compared to other dosage form.

Keywords: Tadalafil, Mouth Dissolving Film, Bioavailability.

INTRODUCTION:

Fast dissolving oral film it is the popular drug delivery system because of its variety of benefits. Fast dissolving drug delivery system was developed in 1970s to overcome the problems related with tablets and capsules for pediatric and geriatric sufferers. These preparations come in contact with saliva and dissolve or disintegrate within a minute, without need of water or chewing. MDFs are prepared by solvent casting method or hot melt-extrusion technology. MDFs are enhancing the bioavailability of the drug and patient compliance. [1, 2]

Mouth dissolving films these are novel dosage forms it comes under fast dissolving drug delivery system. It disintegrates or dissolves within the oral cavity. It does not require water for administration so that it is convenient for medications for the pediatric and geriatric patients which have the difficulty in swallowing. The strip of film is placed sublingually or under buccal cavity so that it avoids the first pass metabolism of the

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DEVELOPMENT AND SPECTROPHOTOMETRIC METHOD VALIDATION OF NIFEDIPINE IN SOLID DOSAGE FORM

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ABSTRACT

The simple, rapid, sensitive and specific method of spectrophotometrically was developed for the validation of nifedipine in solid pharmaceutical dosage form i.e. tablet formulation. The UV spectrum of nifedipine in methanol showed λ max at 249nm. The linearity was established in the concentration range of 10-60µg/ml for nifedipine. This method was validated for different analytical parameters such as linearity, accuracy, precision, ruggedness and robustness. The method has been shown approximate linearity over the range of 10-60µg/ml with the regression equation y=0.007x+0.022 and regression correlation coefficient r^2= 0.996. However, the method was found to be highly precise with LOD (0.041) and LOQ (0.12). Considering above results the developed method can be successfully performed for the assay of nifedipine in different pharmaceutical dosage form.

KEYWORDS

Nifedipine, Spectrophotometry, Methanol, Method development and Validation.

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INTRODUCTON

Nifedipine is chemically known as dimethyl-1, 4-dihydro-2, 6-dimethyl-4(2-nitrophenyl) pyridine 3, 5-dicarboxylate is a calcium channel blocker. It is used as anti-anginal agent that mainly acts as calcium channel blocker that inhibits the transmembrane influx of calcium ions into cardiac muscle cells[1-6]. It is also used for treating vascular disorders such as Raynaud's phenomenon. It is mainly used in the treatment of diuretics and ACE inhibitors even though its main action is calcium channel antagonist. Previously it has been used as emergencies in hypertensive. It has very low bioavailability, thermolaible and photosensitive. After exposing the drug to light and certain

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FORMULATION AND EVALUATION OF FLUCONAZOLE ANTIFUNGAL GEL

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ABSTRACT

The aim of the study was to formulate and evaluate fluconazole topical antifungal gel. Fluconazole is an imidazole derivative and used for the treatment of local and systemic mycosis. The oral use of Fluconazole isn't much recommended because it has many side effects. Fluconazole topical gel preparation aren't available within the market, thus this formulation is made for better patient compliance and to reduce the dose of the drug and to avoid the side effects like liver damage and kidney damage. FT-IR study confirmed the purity of drug and polymers. Fluconazole topical gel was formulated by different polymers with different ratios like Carbopol 971p and noveon AA1 within the concentration of 1% and 1.5% respectively. DMSO was used as penetration enhancer. Formulated gel was characterized for drug content, pH determination, viscosity measurement, spreadability, extrudability, in vitro diffusion and anti-fungal activity. The pH of all formulations lies between the traditional pH range of the skin. Drug content results concluded that the uniform drug distribution throughout the gel formulation. The in vitro diffusion of batch F3 give highest drug release.

KEYWORDS: Fluconazole, Noveon AA1, Carbopol 971p, Topical Gel, Antifungal activity.

INTRODUCTION

Fungal infections are quite common in citizenry, especially within the tropical regions. Fungi produce a good spectrum of human infections starting from superficial skin infections affecting the outer layers of skin, hair, nails and mucous membranes to systemic infections (internal organ invasion). When fungi infect the skin surface, they invade the stratum

RESEARCH ARTICLE

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Formulation and *In-Vitro* Characterization of Oseltamivir Fast Dissolving Tablets Using Super Disintegrants

R Y Patil[1], Atul A Phatak[2], Shrishail M Ghurghure[1*], Sachin Yanjane[1]

Abstract: The aim of the present study was to formulate fast dissolving tablet of oseltamivir using superdisintegrants with the help of solid dispersion technique to improve the aqueous solubility, dissolution rate and to facilitate faster onset of action. Solid dispersion of oseltamivir was prepared with PVP K30 in different drug: carrier ratio using solvent evaporation methods. The optimized solid dispersion (drug: PVP K30, 1:0.5 ratio) were further used to prepare fast dissolving tablet by direct compression method using superdisintegrants such as crospovidone and xanthan gum. Infrared spectroscopy, differential scanning calorimetry and x-ray diffraction were performed to identify the physicochemical interaction between drug and optimized formulation. The pre-compression parameter of prepared powder blends all formulation suggested good flowability and compressibility. The prepared tablets were evaluated for thickness, hardness, friability and weight variation, drug content, wetting time, disintegration time and *in-vitro* dissolution studies. The batch F12- shows highest release of 99.87 % in 25 min.

INTRODUCTION

Tablet is defined as compressed solid dosage form containing medicament with or without excipients. In recent decades, a diffusion of pharmaceutical analysis has been conducted to develop new indefinite quantity forms. The novel drug delivery systems are to increase safety and efficacy of drug by formulating convenient dosage form and to achieve better patient compliance. [1] The matter of swallowing is also a standard development throughout a geriatric patient because of worry of choking, hand tremors, dysphasia and in young people because of underdeveloped muscular and nervous systems this results in a poor patient compliance which may be improved by the fast dissolving tablets. [2] The ideal drug delivery systems have two things would be needed first it might be one dose the period of treatment whether or not it's for days or week, like infection, or for the life time of the patient, as in high blood pressure or diabetes. Fast dissolving tablets are also called as mouth-dissolving tablets, melt-in mouth tablets, Oral dispersible tablets, rap melts, porous tablets, quick dissolving tablet. Fast dissolving tablets dissolve in the oral cavity without water. Most fast dissolving tablets have substances to mask the bitter taste of the active ingredient. [3]

Oseltamivir is administered orally, it is an antiviral drug for the management of influenza A and B infections in children >1 year and adults of all ages. [4] Standard dose of oseltamivir in adult's is 75 mg, while children have unit doses that are selected on the basis of body weight. Oral capsule (35, 40 and 75 mg) and suspension formulations are currently promptly on the market. As fast dissolving tablets can hold the dose up to the 500mg we can suitably administer 75 mg of dose. The mouth disintegrating tablet of oseltamivir will disintegrate rapidly in the patient mouth without need of water or chewing and released its drug contents instantaneously. So this dosage form is more comfortable for paediatric, geriatric patient. [4-5]

Solid dispersion of oseltamivir was prepared with PVP K30 in different drug: carrier ratio using solvent evaporation methods. The optimized solid dispersion (drug: PVP K30, 1:0.5 ratio) were further used to prepare fast dissolving tablet by direct compression method using superdisintegrants such as crospovidone and xanthan gum. Infrared spectroscopy and differential scanning calorimetry were performed to identify the physicochemical interaction between drug and optimized formulation. [6-7]

Advantages of Fast Dissolving Tablet: [3]

1. Improved compliance/added convenience
2. No water needed
3. No chewing needed
4. Better taste
5. Suitable for controlled as well as fast release actives
6. Ability to produce benefits of liquid medication within the style of solid preparation.
7. Allows high drug loading.
8. Adaptable and amenable to existing processing and packaging machinery
9. Cost- effective.

MATERIALS AND METHODS

Oseltamivir were received from Zydus Cadila Ltd, Ahmedabad. PVP k-30, Crospovidone, Manitol, Magnesium stearate, Talc was received from Shri sai Chemical, Solapur.

Calibration Curve of Oseltamivir

Accurately weighed 10mg of drug was transferred to 10 ml volumetric flask and dissolved in methanol, this was considered as stock solution. From stock solution 0.1 ml, 0.2 ml, 0.3 ml, 0.4 ml, 0.5 ml, were taken and was make up the volume to 10ml with methanol to get respective concentrations of (10, 20, 30, 40 and 50) µg/ml. Prepared samples were analyzed by using ultraviolet double beam spectrophotometer at λmax 218 nm.

Preparation of Oseltamivir Fast Dissolving Tablet

1. Step-1 Solid Dispersion Technique-Solvent Evaporation Method

The solid dispersions of oseltamivir were prepared by dissolving the mixture of oseltamivir and the PVP K 30 at

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Original Article

DEVELOPMENT AND VALIDATION OF UV-VISIBLE SPECTROPHOTOMETRIC METHOD FOR ESTIMATION OF TADALAFIL IN BULK AND FORMULATION

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ABSTRACT

Objective: A new simple, sensitive, precise and reproducible spectroscopic method was developed for the determination of Tadalafil in Pharmaceutical formulation with Dimethyl Sulfoxide.

Methods: The UV spectrum of Tadalafil in Dimethyl sulfoxide (DMSO) showed λ max at 285.6 nm. Beer's law is valid in the concentration range of 10-60µg/ml. This method was validated for linearity, accuracy, precision, ruggedness and robustness.

Results: The method was demonstrated excellent linearity over the range of 10-60µg/ml with regression equation y= 0.0337x-0.1343 and regression correlation R^2= 0.998. Moreover, the method was found to be highly sensitive with LOD (2.44µg/ml) and LOQ (7.40µg/ml).

Conclusion: Based on results, the proposed method can be successfully applied for assay of Tadalafil in various pharmaceutical dosage forms.

Keywords: Tadalafil, DMSO, UV-spectroscopic method.

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INTRODUCTION

The common sexual problem in men is Erectile Dysfunction (ED). The meaning of ED is a difficulty in initiating or maintaining penile erection adequate for sexual activity. ED has a weight effect on intimate relationships, quality of life, and overall self-esteem for men [1-4].

Erectile dysfunction (ED) is treated with PDF5 inhibitors. Tadalafil is used to treat ED in men and it is an impotence agent. It is a selective inhibitor of cyclic guanosine monophosphate (cGMP)-specific phosphodiesterase type 5 (PDF5). Tadalafil has also been quantified in pharmaceutical prep rations, human serum and biological fluids by HPLC with UV detection. Although the UV spectrophotometric method is commonly used in industrial laboratories due to its simplicity, selectivity and sensitivity [5, 6].

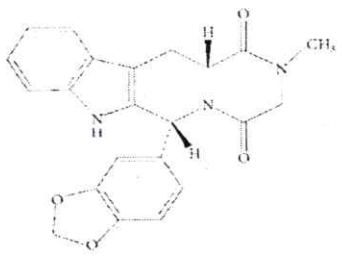

Fig. 1: Chemical structure of tadalafil

Tadalafil (TD) is (6R, 12aS)-6-(1,3-benzodioxal-5-yl)-2,3,6,7,12,12a-hexahydro-2-methylpyrazino[1',2':1,6] pyrido[3,4-b] indole-1,4-dione [3]. It has molecular formula of $C_{22}H_{19}N_3O_4$ and molecular weight of 389.4 gm/ml. Tadalafil is a white powder and has a melting point 301 °C-302 °C. The drug substance is practically insoluble in water and soluble in methanol [7-9].

The aim of the present work was to develop a simple, rapid, accurate and sensitive UV spectrophotometric method for the determination of tadalafil in bulk and pharmaceutical formulation.

MATERIALS AND METHODS

Tadalafil was purchased and Dimethyl Sulfoxide was used of analytical grade.

Instruments

A UV visible double beam spectrophotometer [systronics 2201] and Shimadzu 1800-UV spectrophotometer with 1 cm quartz cuvettes were used for all absorbance measurements. All weights were taken on an analytical balance (Shimadzu). Sonicator (Oscar Ultrasonic Cleaner Microclean) was used for dissolving Tadalafil in DMSO.

Experimental

Preparation of standard stock solution

The standard stock solution of Tadalafil was prepared by dissolving accurately weighed 10 mg in 10 ml of DMSO to obtain 1000µg/ml. It was further diluted to get a standard solution of 100µg/ml.

Method development

Aliquot from the standard solution was taken and diluted with DMSO to get concentration of 20µg/ml and it was scanned between 200-400 nm, which showed the maximum absorbance at 285.6 nm.

Procedure for determination of Assay of Tadalafil in Pharmaceutical formulation

Ten Tadalafil (Tadalista) tablets (label claim 20 mg) were weighed and transferred into mortar triturated into fine powder by using pestle. Tablet powder equivalent to 10 mg of tadalafil was transferred into 10 ml volumetric flask and 10 ml of DMSO was added to dissolve the powder. The solution sonicated for 10 min. After sonication, filtration was carried out by using Whatman filter paper. From the appropriate filtrate conc. of aliquots were taken and diluted to 10 ml with DMSO to get the final conc. of 10-60µg/ml [10, 11].

Procedure for plotting a calibration curve

Aliquots of working standard solution were further diluted with DMSO to get the concentration of 10,20,30,40, and 50µg/ml. Finally, the prepared standards were measured at 285.6 nm in each case against a solvent Dimethyl Sulfoxide as blank.

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Original Article

UV SPECTROPHOTOMETRIC ANALYSIS AND VALIDATION OF OSELTAMIVIRPHOSPHATE IN PURE AND PHARMACEUTICAL FORMULATION

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ABSTRACT

Objective: A new, simple, economical, precise, sensitive, linear, accurate, rapid UV spectrophotometric method has been developed for the estimation of Oseltamivir Phosphate in pure form and pharmaceutical formulation.

Methods: This UV method was developed using Methanol as a solvent. In the present method, the wavelength selected for analysis was 218 nm. UV-Visible double beam spectrophotometer (Systronic 2201) was used to carry out spectral analysis. The ICH guidelines were used to validate the method.

Results: The method was validated for linearity, range, accuracy, precision, robustness, LOD and LOQ. Linearity was found in the range of 10-50µg/ml. Accuracy was performed by using a recovery study. The amount of drug recovered was found to be in the range of 99.01-100.1%. The % RSD value was found to be less than 2.

Conclusion: The developed UV spectrophotometric method was found to be simple, economic, sensitive, easy, accurate, linear, specific and highly sensitive and can be used for routine estimation of Oseltamivir Phosphate.

Keywords: Oseltamivir Phosphate, Methanol, UV-Visible spectrophotometric method, Method validation

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INTRODUCTION

UV-Visible spectrophotometry is one of the most frequently employed techniques in pharmaceutical analysis. By using UV-Visible spectrophotometry, the amount of ultraviolet or visible radiation absorbed by an analyte in a solution is determined [1].

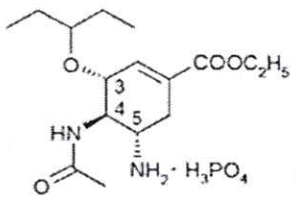

Fig. 1: Chemical structure of oseltamivir phosphate [2]

Oseltamivir Phosphateis also is known as Tamiflu. Its molecular formula is C16H28N2O4. IUPAC name of Oseltamivir Phosphate is ethyl (3R, 4R, 5S)-5-amino-4-acetamido-3-(pentan-3-yloxy) cyclohex-1-ene-1-carboxylate (fig. 1). Oseltamivir is administered orally, it is an antiviral drug for the management of influenza A and B infections in children>1 y and adults of all ages [3]. Oseltamivir phosphate is an ethyl ester prodrug requiring ester hydrolysis for conversion to the active form, oseltamivir carboxylate. Oseltamivir carboxylate is an inhibitor of influenza virus neuraminidase affecting the release of viral particles [4]. The concentrations of oseltamivir carboxylate required for inhibition of influenza virus in cell culture were highly variable depending on the assay method used and the virus tested. Standard dose of oseltamivir in adults is 75 mg, while children have unit doses that are selected on the basis of body weight. Oral capsule (35, 40 and 75 mg) and suspension formulations are now readily available [5]. Antiviral drugs are a class of medication used specifically for treating viral infections rather than bacterial ones. Most of the antiviral drugs are available for treating various types of viral diseases such as, HIV, influenza A and B, herpes viruses, hepatitis B and C viruses [6].

MATERIALS AND METHODS

Instruments

UV/Visible double beam spectrophotometer Systronic 2201. Standard cuvettes having 10 mm of path length are used for analysis. Ultra Sonicator (micro clean-103) was used to sonicate the formulation sample. Drug sample was weighed by using an electronic analytical balance (Shimadzu AY220).

Chemicals and reagents

Active pharmaceutical ingredient of Oseltamivir Phosphate is gifted as a sample from Zydus Cadila Healthcare Ltd, the pharmaceutical company, Vadodara, Gujarat. Marketed formulation of Oseltamivir Phosphate was procured from a local pharmacy.

Experimental work

Method development

Preparation of standard stock solution of oseltamivir phosphate

Accurately weighed 10 mg of drug was transferred to 10 ml volumetric flask and dissolved in methanol, this was considered as a stock solution. From stock solution 0.1 ml, 0.2 ml,0.3 ml, 0.4 ml, 0.5 ml, were taken and was make up the volume to 10 ml with methanol to get respective concentrations of (10,20,30,40 and 50) µg/ml. Prepared samples were analyzed by using an ultraviolet double beam spectrophotometer at λmax 218 nm.

Assay of oseltamivir phosphate capsules

Weigh 20 Capsule of Oseltamivir Phosphate equivalent to10 mg of Oseltamivir Phosphate was weighed, transferred into 10 ml volumetric flask and dissolved in methanol. This solution was sonicated for 10 min and the final volume was made up to the mark with water. 1 ml of solution was transferred into 10 ml volumetric

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DESIGN, OPTIMIZATION AND CHARACTERIZATION OF AN ETHOSOMAL GEL USING MICONAZOLE NITRATE FOR TRANSDERMAL DRUG DELIVERY

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Ethosomes, Miconazole nitrate, transdermal, Touitou hot method

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ABSTRACT

Ethosomal carriers are systems containing soft vesicles and are composed mainly of phospholipid (Phosphotidyl choline; PC), ethanol at relatively high concentration and water. The aim of current investigation is to evaluate the transdermal potential of novel vesicular carrier, ethosomes. Miconazole nitrate ethosomes were prepared using Touitou hot method. Miconazole nitrate loaded ethosomes were prepared using varying concentrations of phospholipid and ethanol, with the help of propylene glycol as penetration enhancer, were optimized and characterized for percent entrapment efficiency, zeta potential, particle size, vesicle morphology and *in-vitro* drug permeation studies. Among all formulations (H1 to H4 containing PC50 while H5 to H8 containing PC70), the formulations with PC70 showed better cumulative amount of drug release. Miconazole nitrate ethosomal gel was prepared using carbopol 940 and it was characterized for pH, spreadability, homogeneity, percent drug content and all the formulations showed fairly acceptable values. 2^2 full factorial design was applied for optimized method H5 to H8 prepared with Pc 70 and ethanol by using Design Expert which showed significant effect on the responses, entrapment efficiency (96.66%) and percent drug release (90.38%). The compositions of ethosomes and gels were manipulated to investigate their effects on the characteristics of final formulations. The miconazole nitrate ethosomal gels also characterized for Erythema and Edema on Albino rats which showed zero irritation score.

1. INTRODUCTION

Skin covers a total surface area of approximately 1.8m^2 and provides the contact between human body and external environment. Drug delivery through human skin has become important aspect of modern therapy. Dermal drug delivery is the topical application of drugs to the skin in the treatement of skin diseases and other infections. Transdermal delivery has become important delivery route that delivers very precise amount of drug through the skin for systemic action. The almost insurmountable nature of SC is a major challenge for systemic delivery of percutaneously applied drugs. Furthermore, it is even more difficult for anything to penetrate to the deeper strata of skin. To overcome the stratum corneum barrier, various mechanisms have been investigated, including use of chemical or physical enhancers such as iontophoresis, sonophoresis, etc. Liposomes, niosomes, transferosomes and ethosomes also have the potential of overcoming the skin barrier and have been reported to enhance permeability of drug through the stratum corneum barrier.[1, 2]

Ethosomal carriers are systems containing soft vesicles and are composed mainly of phospholipid (Phosphotidyl choline; PC), ethanol at relatively high concentration and water. Ethosomes are well established drug

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DISSOLUTION RATE ENHANCEMENT OF KETOCONAZOLE BY SPHERICAL AGGLOMERATION

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ABSTRACT

The purpose of this study was to enhance the dissolution rate of poorly water soluble drug of Ketoconazole by preparing spherical agglomerates by Quassi emulsion solvent diffusion technique using chloroform, water, and methanol as bridging liquid and to illustrate the effect of different polymers on the solubility and dissolution rate of Ketoconazole. Polyvinyl Pyrrolidone (PVP K30) was used in spherical agglomeration process. The formulation was done by 3^2-full factorial design. Stirring speed and the concentration of PVP K30 were used as the variable factors in the applied design. Fourier Transform Infra-Red spectroscopy was used to examine the drug-excipient compatibility. Prepared formulations were evaluated for micromeretic properties and dissolution rate. The spherical agglomerates have lower micrometric properties compared to pure drug. The agglomerates exhibited good compressibility and packability characteristics. The spherical agglomerates with different polymers exhibited increasing in the saturation solubility and dissolution rate.

KEYWORDS: Ketoconazole, Agglomerates, dissolution, Polyvinyl Pyrrolidone (PVP K30).

INTRODUCTION

There are many types of fungal germs (fungi) live mainly in the soil, on food, on our skin and in other places in the environment. However, some types of fungi can grow vigorously on the surface of the body, to cause infection of the skin, nails, mouth or vagina. General mechanism of action of ketoconazole is that, they inhibit C-14α-demethylase, thus blocking the demethylation of lanosterol to ergosterol. This inhibition disrupts membrane structure and

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DEVELOPMENT AND VALIDATION OF THE UV-SPECTROPHOTOMETRIC METHOD FOR DETERMINATION OF SALMETEROL XINAFOATE IN API AND PHARMACEUTICAL DOSAGE FORM

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ABSTRACT

A rapid, simple, selective, sensitive, precise and specific UV Spectrophotometric method has been developed for the determination of Salmeterol Xinafoate in API and pharmaceutical dosage form. Salmeterol Xinafoate standard solution was scanned in the UV range (200-400nm) in 1cm quartz cell in a double beam UV Spectrophotometer. The spectrophotometric detection was carried out at an absorption maximum of 254 nm using Acetonitrile:Methanol (50:50) as a solvent. The method was validated for specificity, linearity, accuracy, precision, robustness and ruggedness. The detector response for the Salmeterol Xinafoate was linear over the selected concentration range 2-12 µg /ml with a correlation coefficient of 0.999 and equation for the regression curve was found to be *y=0.0474x+ 0.0401.* The accuracy was between 98.7-102%. The precision (%RSD) among six samples preparation was 0.459 %. The LOD and LOQ are 0.1056 And 0.3200 µg /ml respectively. Statistical analysis proved that the methods are repeatable and specific for the determination of the said drug. These methods can be adopted in the routine assay analysis of Salmeterol Xinafoate in API and pharmaceutical dosage form.

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FORMULATION AND EVALUATION OF POLYHERBAL FACE CREAM

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ABSTRACT

Cosmetics are the preparation used to enhance the human appearance. The aim of present research was to formulate polyherbal face cream. These formulations are formulated for anti-aging, moisturizing, lighting and protection of skin from various factors. Different herbs used for preparation of face cream are- Fenugreek, Garlic, Potato, Cucumber, Tomato, and Carrot.

KEYWORD: Face Cream, Formulation and Evaluation, Antimicrobial Activity.

INTRODUCTION

The poly-herbal Face cream formulations have been recommended for the management of skin properties. Our face skin indicates our health.[1] A diet containing balanced nutrition is required for the skin to keep it clear, beautiful and healthy.[2] Cosmetics are intended to be applied to the human body for cleansing, beautifying, promoting attractiveness and altering the appearance without affecting the body. Herbal cosmetics protect our skin with less or without any side effects, as compared to synthetic cosmetics. Herbal cosmetics are having desirable physiological effects such as smoothing appearance, enhancing and conditioning properties because of herbal ingredient.[3] The purpose of our herbal cosmetic formulation is not only developing an attractive external appearance, but to achieve healthy skin by reducing skin disorders. Herbal cosmetics are prepared by using herbs in crude drug or extract form. Several skin symptoms, such as leathery texture, mottled pigmentation, and wrinkles. Apart from Intrinsic and photo aging, so called stochastic aging.[4] Upon aging, the skin will lose

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DEVELOPMENT AND VALIDATION OF UV SPECTROPHOTOMETRIC METHOD FOR THE ESTIMATION OF DEFERASIROX IN BULK AND PHARMACEUTICAL FORMULATION

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ABSTRACT

A simple, accurate, precise and sensitive UV spectrophotometric method was developed for the determination of Deferasirox in bulk and pharmaceutical dosage form. The solvent used ethanol and water (9:1) and the wavelength corresponding to maximum absorbance of the drug was found at 248nm. Beers law was observed in the concentration range of 2- 10µg/ml with correlation coefficent 0.9992. The linear regression equation obtained by least square regression method were y = 0.0762x + 0.1058, where y is the absorbance and x is the concentration of the pure drug solution. The method was validated for several parameters like accuracy, precision as per ICH guidelines. The values of relative standard deviation and % recovery were found to be satisfactory, indicating that the proposed method is precise and accurate and hence can be used for the routine analysis of Deferasirox in bulk and pharmaceutical formulation.

KEYWORDS: Deferasirox, UV Spectrophotometer, Method Validation.

INTRODUCTION

Deferasirox is chemically 4-(3, 5-bis (2-hydroxyphenyl) benzoic acid. Its molecular formula is C21H15N3O4 and molecular is weight 373.36 gm/mole. Deferasirox is an oral iron chelator. Its main use is to reduce chronic iron overload in patients who are receiving long

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IN-VITRO COMPERATIVE STUDY OF THREE ORNAMENTAL PLANTS LEAVES EXTRACTS FOR IMMUNOMODULATORY ACTIVITY

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ABSTRACT

In this Present research work the effects of Ethanolic extracts of leaves of *Adina cordifolia (Roxb). Hook*, *Nyctanthes arbor-tristis Linn* and *Thevetia peruviana (Pers.)* Roxb were investigated on the functions of peritoneal macrophages *In-vitro* studies. Macrophage functions were determined through Nitric oxide (NO) estimation and phagocytic activities NBT reduction test. The results indicated that ethanolic extracts of leaves of *Adina cordifolia (Roxb). Hook*, *Nyctanthes arbor-tristis Linn* and *Thevetia peruviana (Pers.)* Roxb were enhanced nitric oxide (NO) production at 50 µg/ml whereas it phagocytic activity of the macrophage was enhanced by the ethanolic extracts at a dose of 100 µg/ml. The proliferation was significantly increased by ethanolic extracts in the EC50 value of 32.27 µg/ml and 49.06 µg/ml after 48 hours incubation. Collectively the results demonstrated that ethanolic extracts of all three plants enhanced innate as well as adaptive immune response and proved the immunostimulating potential of the plants.

KEYWORDS: *Adina cordifolia*, *Nyctanthes arbor-tristi, Thevetia peruviana*, Immunomodulation, Macrophage, Lymphocyte proliferation.

INTRODUCTION

The immune system is a complicated network of cells and tissues working together to distinguish self-particles from non-self invaders such as microorganisms.[1] Plant-derived compounds, bacterial products, synthetic drugs and marine compounds have been used as immunomodulation agents. However, plant-derived compounds also have an important role

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In-vitro anthelminthic activity of *Adina cordifolia*, *Nyctanthes arbor tristis* and *Thevetia peruviana* on *Phertima postuma* and *Ascaris gallis*

Rudramuni Kore and Manish Kondawar

Abstract
In Indian medicinal plant literature, leaves of *Thevetia peruviana, Nyctanthes arbor-tristis* (Linn.), *Adina cardifolia* (Roxb.) have been traditionally reported to be used as anthelmintics. The scientific authentication about traditional claim of anthelmintic activity of the aqueous and ethanolic leaf extracts of *Thevetia peruviana, Nyctanthes arbor-tristis* (Linn), *Adina cardifolia* (Roxb.) on Indian earthworms *Pheretima postuma* and nematode *Ascaris gallis* not yet available. Hence we conducted a comparative study to examine these plant species for anthelmintic potential to support traditional claim which can prove beneficial to the suffering people.
The aqueous and ethanolic extracts of the three plant parts were investigated for anthelmintic activity using Indian earthworms *Pheretima postuma* and nematode *Ascaris gallis* showed significant result on both worms as compared to piperazine citrate. Determination of anthelmintic activity was done by recording the paralysis time (P) and death time (T) of the worms. Anthelmintic treatment is an important in inducing immunomodulation, subsequently useful in treatment of various diseases.

Keywords: Anthelmintic activity, ethanolic extracts, helminthiasis, phytochemicals. *Thevetia peruviana Nyctanthes arbor-tristis* Linn *Adina cordifolia*

Introduction
There is a close relation between immune system and parasite infection where the response of the immune system could result in cancer development and protection of parasites as per earlier reports [1]. Parasite is considered to be significant regulator of the host immune system as they can restrain pathways of immune activation as T cell cytokine, B cell antibody production and other immune mechanism. Infection due to parasites could augment carcinogenesis through the discharge of procarcinogenic factors, or suppression [1, 2].
These infections caused by helminth are common health problems in developing countries can affect most population in endemic areas with major economic and social consequences. Currently there are large number of available anthelmintic drugs treatment helminthes diseases but there are evidence of resistance amongst gastro-intestinal helminthes towards such drugs shown tremendous side effect as nausea and vomiting, abdominal pain, appetite loss, headache and diarrhea [3, 4]. Hence there is an increasing demand towards natural anthelmintics as there easy to obtain and safe and moreover they have holistic approach.
Thevetia peruviana (Yellow Oleander) belonging to family Apocynaceae plant is native of Central & South America, but found in the tropical and sub-tropical. The plant shows diverse medicinal properties for the treatment of gastrointestinal and inflammatory diseases, heart failures and skin tumor [5, 6].
Nyctanthes arbortristis (Linn.) (Night Jasmine) belonging to family Oleaceae is an important drug used in use in Ayurveda, Sidha and Unani systems used for treatment of rheumatic joint pain, malaria, antidote to reptile venoms, mild bitter tonic, laxative, diaphoretic and diuretic [7].
Adina cordifolia (Roxb.) (*Haldina cordifolia*; Kelikodom) belonging to the family Rubiaceae, native to East Asia and Southeast Asia and grows in Bangladesh, India, and Thailand. It has been used for the treatment of cholera, cold cough, fever, headache, rheumatism etc. [8].
Selection of this activity is based on the fact that the selected medicinal plant has been used to expel worms in traditional text and which can be correlated to its influence the immunological balance. Indian adult earthworms (*Pheretima posthuma*) obtained from soil and nematode (*Ascaridia galli*) obtained from the infected intestine of freshly slaughtered fowls were used due to its anatomical resemblance with the intestinal roundworm parasites present in human beings are used for the evaluation of anthelmintic activity. The phytoconstituents from all the selected plant has shown to have the presence of flavonoids, tannins, terpenes alkaloids [7, 8].

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FORMULATION AND EVALUATION OF TOPICAL ANTIFUNGAL GEL CONTAINING FLUCONAZOLE

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ABSTRACT

The aim of the study was to formulate and evaluate fluconazole topical antifungal gel. Fluconazole is an imidazole derivative and used for the treatment of local and systemic fungal infection. The oral use of Fluconazole is not much recommended as it has many side effects. Fluconazole topical gel preparation are not available in the market, thus this formulation is made for better patient compliance and to reduce the dose of the drug and to avoid the side effects like liver damage and kidney damage. FT-IR study confirmed the purity of drug and polymers. Fluconazole topical gel was formulated by different polymers with different ratios such as Carbopol 971p and noveon AA1 in the concentration of 1% and 1.5% respectively. DMSO was used as penetration enhancer. Formulated gel was characterized for drug content, pH determination, viscosity measurement, spreadability, extrudability, in vitro diffusion and anti fungal activity. The pH of all formulations lies between the normal pH range of the skin. Drug content results concluded that the uniform drug distributionthroughout the gel formulation. The in vitro diffusion of batch F3 give highest drug release.

KEYWORDS: Fluconazole, Noveon AA1, Carbopol 971p, Topical Gel, Antifungal activity.

INTRODUCTION

Fungal infections are very common in human beings, especially in the tropical regions. Fungiproduce a wide spectrum of human infections ranging from superficial skin infectionsaffecting the outer layers of skin, hair, nails and mucous membranes to systemic

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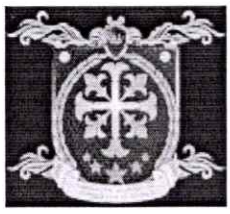

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Formulation and Evaluation of Ritonavir Floating Tablets.

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ABSTRACT

The aim of present research work was to formulate gastro retentive floating tablets containing Ritonavir. The floating tablets of Ritonavir was formulated by direct compression technique using natural, semi-synthetic and synthetic polymers such as gellan gum, HPMC K4M, and carbopol 971p. Sodium bicarbonate was used as gas generating agent. FTIR studies revealed that there is no interaction between the drug and the polymers used in the formulation. Prepared Ritonavir tablets were evaluated by various quality parameters including weight variation, hardness, friability, drug content, tablet density, floating test, swelling index, *in-vitro* drug release and showed satisfactory results. Formulations F2, F5, F6 showed satisfactory drug release of 90.3%, 94.3%, and 97.7% respectively. The optimized batch F6 shows good results and extended drug release.

Keywords: Ritonavir, Floating tablet, gellan gum, carbopol 971p, HPMC K 4M.

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A comparative phytochemical analysis of *Bougainvillea glabra* and *Catharanthus roseus*

Dr. VS Tegeli, PS Shinde, PA Shiranal, SV Shilwant, PR Surwase, GS Shendage and MM Shirawar

Abstract
The present study was undertaken to find out the phytochemicals present in *Bougainvillea glabra* leaves extract and comparative study between *Bougainvillea glabra* and *Catharanthus roseus.* Fresh leaves was collected and were processed for preparation of plant extract using specified technique. The plant extract was then subjected for different qualitative chemical test to investigate the chemical profile of *B.glabra* and *Catharanthus roseus* extract. Analysis show the presence of alkaloid, Flavonoids, phenolic compound and tannins in the extract as confirmed by implying different qualitative tests specified for these phytochemicals.

Keywords: Phytochemical analysis, *Catharanthus roseus, Bougainvillea glabra,* antimicrobial activity

Introduction

Phytochemicals are bioactive substance of plants that have been associated in the protection of human health against chronic degenerative diseases [2]. The major group of phytochemicals that may contribute to the total antioxidant capacity (TAC) of plant foods include polyphenols, carotenoids and the traditional antioxidant vitamins such as vitamin C and vitamin E. The vitamins are, however, not the only phytochemicals that can have positive effects on the health of consumers [1, 4]. There are other phytochemicals present in plant foods that may have positive effect on the health of consumer and need further investigation. These phytochemicals may be present in small amounts but may be very important to the health of consumer [1, 4].

"Phyto" is the greekword for plants. There are many "families" of phytochemicals and they help the human body in a variety of ways. Phytochemicals may protect humans from a host disease. Phytochemical are non-nutritive plant chemicals that have protective or disease preventive properties. Plants produce these chemicals to protect it but recent research demonstrates that many phytochemicals can protect human against disease. There are many phytochemicals in fruits and herbs and each works differently.

Bougainvillea is a very common ornamental plant grown almost all over the world in tropical and subtropical gardens. It is grown as a shrub as well as a climber. It belongs to the family Nyctaginaceae which has ten species, but only 3 species are horticultural important. The bougainvillea flower is a true, perfect flower that is surrounded by showy, vibrant brackets the colourful bracts are in fact, not petals but modified leaves, adapted to attract pollinator to colourless and acentless flowers residing on the upper surface. The leaves of *Bougainvillea glabra* are reported to have anti-inflammatory activities anti hyperglycaemic activity, anti insecticidal activity, antihyperglycaemic activity, anti ulcer, antimicrobial activity [5]. And its antiviral protein was characterized. *Bougainvillea glabra* have been used by practitioner of Mandsaurin for varieties of disorders like diarrhoea, reduces acidity, cough and sore throat decoction of dried flowers for the blood vessels and leucorrhoea and decoction of stem in hepatitis. The main part used is leaves. Hence, the present study has been made to investigate the phytochemical screening of *Bougainvillea glabra* and comparative study of *Catharanthus roseus*.

Catharanthus roseus is an important medicinal plant of the which have more than 70 different type of alkaloids and chemotherapeutic agents that are effective in treating different type of cancers-breast cancer, lung cancer, uterine cancer, melanomas, Hodgkin's and non-Hodgkin's lymphoma [3]. It is known as *Catharanthus roseus*, Ammocallis roseus and Lochnera roseus. *Catharanthus roseus* is an Indian herb which grows in the Indian subcontinent [6]. *Catharanthus roseus* are cultivated and has two common names, which is named of their flower colours, Pink: Roseus, White: Alba [7]. Leaves of *Catharanthus roseus* are used for the treatment of some diseases like, Menorrhagia, Rheumatism, Dyspepsia, Indigestion,

RESEARCH ARTICLE

Preparation and Evaluation of Sustained Release Matrix Tablets of Paliperidone Using Natural Polymers

Shrishail M Ghurghure[1], Deepak S Bhosale[1], Mahewash Sana A Pathan[1*]

Abstract: Paliperidone is a well known dopamine antagonist of the atypical antipsychotic class. In present study paliperidone was formulated as matrix type sustained release tablets using natural polymers. Gum exudates are among the oldest natural polymers. They are already being used as thickening and stabilizing agent from last several years. The plant derived polymers comply with many requirements of pharmaceutical excipients. The aim of sustained release formulation is to reduce the frequency of dosing. Tablets were prepared by direct compression method. The optimized formulations contain paliperidone as active ingredient and guar gum, xanthum gum and Acacia gum are used as polymers. The evaluation parameters include the thickness, weight variation test, drug content, hardness, friability and *in-vitro* release studies. Based on the results of *in-vitro* studies it was concluded that the natural polymers can be used as an efficient matrix former to provide sustained release of paliperidone. The release of paliperidone was prolonged for 20 hrs, indicating the usefulness of the formulations for once daily dosage forms. Thus the reducing frequency of dosing increases patient compliance.

INTRODUCTION

Drug products designed to reduce the frequency of dosing by modifying the rate of drug absorption have been available for many years. Regular research is going on in field of use of naturally occurring biocompatible polymeric material in designing of dosage form for oral controlled release administration. Natural gums are biodegradable and nontoxic, which hydrate and swell on contact with aqueous media, these are cost effective, easily available and suitable hydrophilic matrix systems compared with the extensively investigated hydrophilic matrices (i.e., Hydroxypropyl methylcellulose (HPMC)/ Carboxymethyl cellulose (CMC) with respect to *in-vitro* drug release rate) and hydration rate of the polymers and these have been used for the preparation of dosage form. [1] The term matrix indicates a three dimensional network composed of drug(s), polymer(s) and other excipients. Because of simplicity, ease in manufacturing, scale-up and process validation; stability and low costs, matrix preparation has become a popular approach. Drugs are usually embedded in hydrophilic or hydrophobic matrices to exert control on their release. [2]

Paliperidone is a dopamine antagonist of the atypical antipsychotic class of medications and is an active metabolite of the older antipsychotic risperidone (paliperidone is 9-hydroxy risperidone). Paliperidone has antagonist effect at α_1 and α_2 adrenergic receptors and at H1 histamine receptors. It does not bind to muscarinic acetylcholine receptors. In addition it binds with dopamine and serotonin receptors. [3] Presently paliperidone is available as INVEGA Extended-Release Tablets in 1.5 mg, 3 mg, 6 mg and 9 mg strengths. INVEGA utilizes OROS osmotic drug release technology. Paliperidone (as Invega) was approved by the FDA for the treatment of schizophrenia in 2006. It is marketed for the treatment of schizophrenia and schizoaffective disorder. Paliperidone was approved by the FDA for the treatment of schizoaffective disorder in 2009. It may also be used off-label for other conditions.

The objective of this study was to design and evaluate sustained release matrix tablets of paliperidone using natural polymers such as gum acacia, xanthum gum and guar gum by direct compression technique. Guar gum is obtained from endospermic seeds of Cyamopsis tetragonolobus belonging to family Leguminoseae. Guar gum occurs as nearly odourless, white to yellowish white powder with a bland taste. Chemically guar gum is a polysaccharide composed of galactose and mannose. Xanthum gum is a high molecular weight extra cellular polysaccharide produced by fermentation of gram negative bacterium *Xanthomonas Compestris*. The primary structure of this naturally produced cellulose derivative contain a cellulosic backbone (β-D-glucose residues) and a trisaccharide side chain of β-D-mannose-β-D-glucoronicacid-α-D-mannose attached with alternate glucose residues of the main chain. Xanthum gum shows a higher ability to retard the drug release. [5]

MATERIALS AND METHODS

Paliperidone was obtained from Nova Chem. Drugs Pvt Ltd, Pune. All other ingredients used i.e. xanthum gum; gum acacia, guar gum, magnesium stearate and lactose were of analytical grade.

Extended release tablets were prepared by direct compression method. All ingredients were weighed and passed through 40# sieve, blended except lubricant. These above granules were lubricated with magnesium stearate, which was previously passed through 60# Sieve. The lubricated granules were for compressed 100 mg tablet using 6mm die and punches, with hardness between 5-6 kg/cm^2. Three formulations are prepared using three gums i.e. guar gum, xanthum gum and gum acacia as shown in Table 1.

Precompression Characterization

1. Angle of Repose

The angle of repose was determined by the funnel method. The granules were allowed to flow through the funnel freely onto the surface. The diameter of the powder cone

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Articles

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Formulation and Evaluation of Emulgel of Capsicum frutescence Extract

01-Jul-2018 Research 2018 : July-September

Yogesh S Thorat*, Madhuri Pandurang Alte, Hosmani Avinash H, Akshay Sudhakar Dhupad, Pooja Vijaykumar Padwal

Capsaicin is the most abundant of capsaicinoid which is the pungent metabolite in the fruits of Capsicum species. Capsaicinoid is respons Capsaicin has been used as a topical analgesic against rheumatoid arthritis pain and inflammation. The aim of the proposed research work w extract for topical therapy of rheumatoid arthritis. Eucalyptus oil/ wintergrass oil are also known to have additional benefits in the anti-inflan formulate a simple emulsion containing Capsicum frutescence extract using eucalyptus oil/ wintergrass oil. It was found that simple emulsion approach of microemulsion was preferred to formulate microemulsion by using Span 20, Tween 60, Stearic acid was used as surfactant a constructed using Eucalyptus oil/ Wintergrass oil as oil phase. Emulgel was evaluated for influence of various temperatures, organoleptic test, p microemulsion formulation was found to be stable in Freeze-thaw study. The penetration of capsaicinoid from each dosage forms was evaluate chili fructus extract is containing 1.93±0.2% capsaicinoid. The percentage of penetrated capsaicinoid from emulgel dosage form was 98.118%.

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Formulation and Evaluation of Topical Gel Using Ocimum basilicum Extract Containing Ketoconazole for Skin Diseases

01-Jul-2018 *Research* *2018 : July-September*

Madhuri Pandurang Alte, Yogesh S Thorat, Ainish H Hosmani, Akshay Sudhakar Dhupad, Pooja Vijaykumar Padwal*

Topical delivery is an attractive route for the local and systemic treatment. The delivery of the drugs onto the skin is recognized as an effective Topical gels are becoming more popular due to ease of application and better precutaneous absorption. Topical gel drug administration is a loc through ophthalmic, rectal, vaginal and skin as topical routs. Gel formulation provides better application property and stability in comparison t offers potential advantages of delivering the drug directly to site of action and acting for an extended period of time. The purpose of the present of ketoconazole. The gel formulation was designed by using Ocimum basilicum mucilage, Carbopol 940 and HPMC K100M as gellin formulations were determined. In-vitro drug release study of F2 formulation shows the 94.16% drug release and permeation studies done with release in 6 hrs respectively. The stability study revealed no significant difference between before and after storage.

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128

DERIVATIVE SPECTROPHOTOMETRIC ESTIMATION OF NEVIRAPINE IN PHARMACEUTICAL DOSAGE FORM

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ABSTRACT

The first derivative spectrophotometric method in methanol have been developed for the determination of Nevirapine in bulk drug and its pharmaceutical formulations. Nevirapine exhibits absorption maxima at 295 nm. In the first derivative spectra of Nevirapine, the amplitude of positive maxima was measured at 291nm. Linearity in the concentration range was found to be 5-30µg/ml. The results of analysis have been validated statistically and also by recovery studies. The method were found to be simple economical accurate and reproducible and can be adopted in routine analysis of Nevirapine in bulk drug and Pharmaceutical dosage form.

KEYWORDS: Nevirapine, First Derivative Spectrophotometry, NRTI etc.

INTRODUCTION

Nevirapine [NVP] is (shown in fig no.1) 11-cyclopropyl-5,11-dihydro-4-methyl-6Hdipyrido[3,2-b:2′,3′-f][1,4]diazepin-6-one. Nevirapine is a non-nucleoside reverse transcriptase inhibitor (nNRTI) with activity against Human Immunodeficiency Virus Type 1 (HIV-1).Nevirapine binds directly to reverse transcriptase (RT) and blocks the RNA-dependent and DNA-dependent DNA polymerase activities by causing a disruption of the enzyme's catalytic site. It is use in HIV treatment as first generation drug. Literature survey revealed the availability of methods of estimation of the drugs by HPLC in plain solution and in human plasma either alone or a mixture of same drug category. No derivative

INDO AMERICAN JOURNAL OF PHARMACEUTICAL RESEARCH

FORMULTION OF LIPOSOMES CONTAINING EXTRACT OF *CYNODON DACTOLON Linn.* BY 3^2 FACTORIAL DESIGN

129

Yogesh S. Thorat[1], Naushad N. Mirza[1*], Parikshit D. Shirure[1], Avinash H. Hosmani[2]

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ABSTRACT

Objective: The objective of the present study was to formulate and evaluate liposomes loaded with extract of *Cynodon dactylon linn.* Methods: Liposomes containing extract of *Cynodon dactylon linn* were made by thin layer film hydration method. Soya lecithin and cholesterol were used to make multiliamellar vesicles. Nine batches of liposomes were prepared based on the different weight ratio of Soya lecithin and cholesterol. Scanning Camera microscopy, IR, Drug entrapment, Dug release, Diffusion study, Stability study were conducted. Results: The prepared liposomes were evaluated by particle size analysis, entrapment efficiency, release study and stability study. Particle sizes were determined from the scanning Camera microscopy (SCM) photographs. It showed that F2, F5 and F8 batches had a good release results and smaller liposomes while F1, F3, F4, F6, F7 and F9 shows a poor release result with a mean at 269 µm. The percentage entrapment efficiency was found to be 76.13, 83.78, 73.44, 79.81, 86.19, 81.43, 74.32, 83.79, and 71.54 % respectively. The satisfactory batches F2, F5, and F8 was packed in containers and stored at 4°C temperature for one month. At the end of one month, the samples were analyzed for their physical properties, drug entrapment and in vitro release profile. The percentage release was found to be 77.4, 79.24, and 74.9% after 5 hrs. Conclusion: The formulation of Liposomes containing extract of *Cynodon dactylon* was carried out. The batches F1 to F9 were evaluated for Scanning camera microscopy, drug entrapment, drug release, diffusion study and stability study, the results are shows, The F2, F5, and F8 batches showed most promising results compared to other batches. No significant change was found during one month's stability study of final batches.

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FORMULATION AND EVALUATION OF TOPICAL ANTIFUNGAL GEL CONTAINING ITRACONAZOLE

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ABSTRACT

The objective of the present research work is to formulate and evaluate Itraconazole antifungal gel. Itraconazole is an imidazole derivative and used for the treatment of local and systemic fungal infection. The oral activity of Itraconazole is not much proven to be efficient as it has many side effects. This formulation is made for better patient compliance and to reduce the dose of the drug. The gel was formulated by changing the polymer ratio. Various formulation (F1, F2, F3, F4) were developed by using a suitable polymer (carbopol 971p and noveonAA1). The formulation was evaluated for, spreadability, extrudability and viscosity *in vitro* drug release study. Viscosity studies of various formulations revealed that formulation F4 was better to compare to others. From among all the developed formulation, F4 shows better drug diffusion, did good Rheological properties. pH of the F4 formulation is sufficient enough to treat the skin infections. Results indicated that the concentration of carbopol 971p and noveon AA1 significantly affects drug release and rheological properties of the gel. It was concluded that formulation F4 was the best formulation among this formulation. Hence formulation F4 has shown the better results compared to other batches.

Keywords: Itraconazole, carbopol 971 p, noveon AA1, antifungal.

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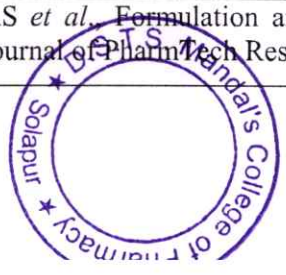

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Antimicrobial Activity of Pomegranate Juice

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Abstract

Punica granatum L. (Punicaceae), commonly called pomegranate and belongs to family Lythraceae. The natures power fruit has s antioxidant, anti-inflammatory, antibacterial properties, recent studies have shown some anticancer activities. P. granatum have potential activity against bacterial infections. An agar-well diffusion method was employed for determination of antibacterial activitie using nutrient agar medium (HIMEDIA). The antimicrobial activity of pomegranate was studied along with sugar.

Keywords

Pomgranate juice, antimicrobial activity, *Punica granatum*.

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RESEARCH ARTICLE Am. J. PharmTech Res. 2019; 9(02) ISSN: 2249-3387

AMERICAN JOURNAL OF PHARMTECH RESEARCH

Design and Development of Tooth Paste Containing Alcoholic Extract of Psidium Guajava Leaf

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ABSTRACT

The intension of present work is to incorporate economically cheap, easily available but effective herbal ingredient in personal hygiene products. Leaves of species *Psidium Guajava* belonging to family*Myrtaceae*(Guava) have many properties like antibacterial, anti-cancer, anti-diabetic, anti-oxidant etc. The leaf extract of guava has traditionally been used for its health benefits. Toothpaste is a dentifrice used clean, maintain and improve the health of teeth. Toothpaste is mainly used to promote oral cleanliness and also acts as an abrasive that helps to prevent dental plaque and food particles from the teeth. The main aim of this investigation is to incorporate the herbal ingredient to that toothpaste that can effectively cleanse oral bacteria. Guava leaves were obtained from domestic garden. Guava leaves were washed with distilled water and shade dried for three days and then powdered for extraction. Guava leaf extraction was performed by Soxhlet apparatus with 70% ethanol for its antibacterial activity. This extract was used as principle ingredient for herbal toothpaste. Toothpaste formulation performed at laboratory level. The formulation was subjected to various evaluation tests like pH, spreadability, foaming ability, moisture content and zone of inhibition. All the results of evaluation tests found within the limits. For getting antibacterial property extraction is done against ethanol and agar well diffusion method used to identify its antibacterial activity shown by guava leaf extract on Escherchia coli, staphylococcus aureus depends on saponins, tannins and flavonoids. Even the extract can be used directly for treatment of inflamed gum. Pentacyclictri-terpenoidguajanoic acid is main constituent of guava leaf extract.

Keywords: *GuajavaPsidium*, Herbal Toothpaste, Antibacterial, Soxhlet, alcoholic extract.

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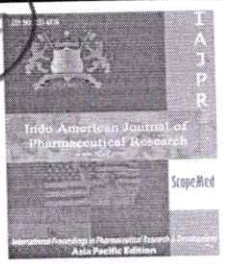

PREPARATION AND *IN-VITRO* EVALUATION OF ITRACONAZOLE LOADED NANOSPONGES FOR TOPICAL DRUG DELIVERY

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Nanosponge,
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Itraconazole,
Hydrogel.

ABSTRACT

Itraconazole is an imidazole derivative and used for the treatment of local and systemic fungal infections. It is a BCS Class II drug having very low solubility in water i.e. 1-4ng/ml. T he oral use of Itraconazole is not much recommended as it has many side effects. The present research has been undertaken with the aim to develop a topical hydrogel formulation of Itraconazole loaded nanosponges to increase the solubility, permeability and stability of itraconazole. Itraconazole loaded nanosponge was prepared by emulsion solvent diffusion method by using different concentrations of ethyl cellulose as a polymer, Polyvinyl alcohol as surfactant and dichloromethane as cross linking agent. Physical characteristics of the nanosponges as well as the drug entrapment efficiency, percentage drug content, Percent yield, drug polymer compatibility, solubility studies of the nanosponges were investigated. Particle size analysis and surface morphology of nanosponges were performed. The scanning electron microscopy of nanosponges showed that they were spherical in shape and spongy in nature. Drug entrapment efficiency was found to be in the range of 42.75 % to 73.10 %. The optimized nanosponge formulation was loaded into hydrogel using carbopol 940 and studied for pH, viscosity, *in vitro* drug release. Of the nanosponge formulations prepared, F4 was found to show drug release of 70.62%. It was concluded that Itraconazole nanosponge hydrogel may have increased solubility, and drug release.

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RESEARCH ARTICLE

inventi | Spreading Knowledge

Formulation and Evaluation of Face Pack Containing Pomegranate Peel Powder

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Abstract: The objective of proposed research work was to formulate and evaluate a cosmetic herbal face pack for glowing skin by using natural ingredients with the varying concentrations of six different formulations containing ingredients such as multanimitti, turmeric, pomegranate peel powder, sandalwood were prepared named as F1 to F6. All the prepared formulation were evaluated by different parameters like organoleptic properties and physiochemical properties. Among all formulations, F3 was found to be good in organoleptic and physicochemical parameters. Products used for the purpose of cleansing, beautifying, promoting attractiveness or alternating one's appearance.

INTRODUCTION

Facial skin is the major part of the body. It not only controls the loss of valuable fluid, prevents the penetration of noxious foreign materials and radiation and cushions against mechanical shock, but also regulates heat loss. As shown in Figure 1.

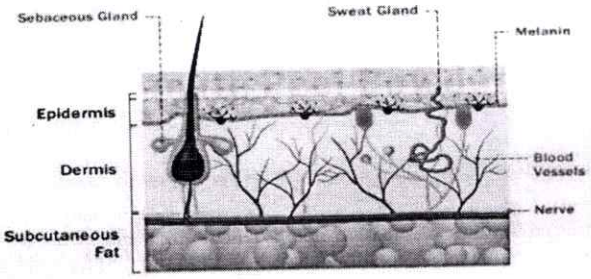

Figure 1: Skin structure

From the ancient era, people are using herbs for cleaning, beautifying and managing skin. Isolated epidermis is as impermeable as whole skin; whereas once the epidermis is removed the dermis is completely permeable. It is unlikely that emulsified fat on the skin surface greatly affects permeability, sweat glands. Hair follicles are more permeable than the surface epithelium, though material may possibly reach the sebaceous glands by follicular route.

Facepack

Face pack is the smooth powder which is used for facial application. These preparations are applied on the face in the form of liquid or paste and allowed to dry and set to form film giving tightening, strengthening and cleaning effect to the skin. These are basically additives delivering some additional benefits. Different types of herbal face pack are used for different types of skin. Herbal face packs are help to reduce wrinkles, pimples, acne and dark circles. Also increases the fairness and smoothness of skin. It also helps to boost their confidence.

Natural face packs are less complicated and pretty simple to use.

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These packs are available in various types and broadly classified into the following categories:

1. Plastic masks: waxes based, latex based or vinyl based
2. Hydrocolloid masks: gel masks (ready to use)
3. Argillaceous masks: clay based or earthy based (ready to use or dry powder)

Present project deals with the formulation and evaluation of cosmetic herbal face pack for glowing skin at home by using natural materials i.e. turmeric, sandalwood, pomegranate peel powder, multani mitti.

Benefits of Applying Face Pack

1. Nourishes the skin
2. Helps to reduce acne, pimple, scars and marks depending on ingredients.
3. Removes dead cells of skin.
4. Face pack provides a soothing and relaxing effect on skin.
5. They help to restore the lost shine and glow of skin in short span of time.
6. Improves the skin texture and complexation.
7. Harmful effects of pollution and harsh climates can be effectively combated with judicial use of face pack.
8. Natural face pack make the skin look young and healthy.

MATERIALS AND METHODS [5-8]

The materials used in the present study were purchased from local market. All the materials used in the study i.e. Multani mitti, Turmeric and Sandalwood were purchased from Tilak Chowk, Solapur in the form of dried powder. Pomegranate fruits were purchased from local market. After opening the fruits, the peels were then manually separated. Collected peels were then rinsed with tap water and dried. After complete drying, peels were ground separately in a blender.

Multanimitti [18]

It is also known as fuller's earth or fuller's clay. Fuller's earth consists primarily of hydrous aluminium silicates of varying composition. Common components are montmorillonite, kaolinite and attapulgite. Modern uses of fuller's earth include absorbents for oil and dirt. Minor uses include filtering, clarifying and decolorizing, active and inactive ingredient in a beauty products and as filler in adhesive and pharmaceuticals. It is also called as whitening clay, particularly used to treat facial pigmentation, such as

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Micellar liquid chromatography: Review

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Abstract
Micellar liquid chromatography (MLC) as a separation science technique remains hindered by reduced chromatographic efficiency compared to reversed phase liquid chromatography using hydro-organic mobile phases. The reduced efficiency is linked to the adsorption of surfactant monomers onto the stationary phase, resulting in a slow mass transfer of the analyte within the interfacial region of the mobile phase and stationary phase. The effect of various bonded stationary phases and silica pore sizes on efficiency in MLC was evaluated using an array of twelve liquid chromatography columns, including large-pore short alkyl chain, non-porous, superficially porous, and fluorinated stationary phases. The effect of organic micellar mobile phase additives was also evaluated using combinations of 1-propanol, 1-butanol, 1-pentanol, and triethylamine. A simplified equation for calculation of A′ and C′ terms from reduced plate height (h) versus reduced velocity (v) plots was developed to compare efficiency data obtained with different columns and mobile phases. Surfactant adsorption isotherms were measured for five columns with three Micellar mobile phases to further understand the relationship between adsorbed surfactant, mobile phase additive, and column efficiency. Clear improvements in efficiency were observed with addition of 2% (v/v) triethylamine to 1-butanol modified aqueous micellar mobile phase in combination with the use of short alkyl chain, wide-pore silica columns, specifically, Nucleosil C4, 1000Å pore size. This finding is supported by lower amounts of surfactant adsorbed onto the stationary phase when triethylamine is present in the mobile phase compared to surfactant only, or 1-butanol modified mobile phase. In a separate series of experiments, elevated column temperatures were evaluated to determine the effect of temperature on efficiency. Efficiency improvements from 9% to 58% were observed for different columns over the temperature range of 40 to 70°C. Finally, a quantitative method of direct injection of equine serum for detection of banned non-steroidal anti-inflammatory drugs in equestrian events was developed to take advantage of the observed enhancements in efficiency in the area of greatest benefit for MLC, the direct injection of physiological fluids.

Keywords: micellar liquid chromatography (MLC), surfactants and micelles, surfactant interactions with the stationary phase, surfactant adsorption, classification of models in MLC, optimization, applications

Introduction

Micellar liquid chromatography (MLC) is one of the many areas of liquid chromatography, which evolved from the studies of organized solutions. The solutions of surfactants above the critical micelle concentration (CMC) belong to most extensively studied organized solutions were used as mobile phases in MLC. The same organized solutions are being studied now as mobile phases in micellar electro kinetic chromatography. The starting point of MLC was pioneering by works of Armstrong more than 25 years ago [1] The evolution of MLC is reflected in over 500 articles and reviews. The importance of MLC is confirmed by occurrence of the book "Micellar Liquid Chromatography" published by Berthod and Garcia-Alvarez-Coque [2], chapter in "Encyclopedia of Separation Science" [3] and a volume in "Comprehensive Analytical Chemistry" edited by Pramauro and Pellizzetti [4]. Theory and application of MLC is being developed by scientific groups in Spain, France, USA, Japan, Georgia, China, India, Pakistan, Iran etc. MLC today is extensive field of investigation that comprehended the problems of analytical chemistry, pharmacy and medicine, food and agricultural chemistry, chemo metrics and physicochemical studies. Several excellent reviews have appeared during the development of theory and practice of MLC [5, 7-19].

Most of them have been published in special issue of Journal of Chromatography A (1997, Vol. 780) that was aimed to collect most important achievements in micelle-mediated separation techniques [12-14, 18, 19]. Good review about all aspects of MLC has been published by Basova *et al.* [8] in Russian.

Surfactants and Micelles

As its name suggests, the liquid mobile phases used in MLC are solutions of surfactants at concentrations where micelles are formed. The unique nature of MLC is due to the use of the aqueous surfactant solutions. Surfactants belong to the class of compounds known as amphiphiles, or molecules having both a hydrophobic and hydrophilic component [20] The hydrophobic component is generally referred to as the tail group and hydrophilic group is known as the head. The term surfactant comes from a contraction of "surface active agent" and is defined as a material which when present at low concentrations, adsorb onto the interface, or surface, of the system and thereby alters the interfacial free energies of the interface [21]. The concept of micelles in solution was

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In vitro anti-inflammatory and anthelmintic activity of *Tectona grandis* leaves extract

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Abstract
Ayurvedic system of medicine is one of the oldest systems in India. Herbs and herbal products, with their incredibly wide use throughout time and place, continue to provide real health benefits while maintaining safety profile. The conservative drug available in the marketplace treat inflammation and analgesia produces various side effects. For conquer these problems medicinal plants play a major role to alleviate many diseases related with inflammation and analgesia. *Tectona grandis* (Family - Lamiaceae) is one of the most famous timber plants in the world and is renowned for its dimensional stability, extreme durability and hard which also resists decay even when unprotected by paints and preservatives. Teak is the major exotic species found in tropical regions. It allays thirst, and acts as antihelmintic, expectorant and anti-inflammatory. The objective of present study was to evaluate in vitro anti-inflammatory activity and antihelmintic of ethanolic extracts of *Tectona grandis* leaves. The results of plant extracts were found to have significant ($P<0.005$) anti-inflammatory activity and showing effective against parasitic infections.

Keywords: *Tectona grandis*, anti-inflammatory activity, antihelmintic activity, phytochemical tests

1. Introduction
Medicinal plants have been playing an essential role in the development of human culture. As a source of medicine, Medicinal plants have always been at forefront virtually all cultures of civilizations. Medicinal plants are regarded as rich resources of traditional medicines and from these plants many of the modern medicines are produced. For thousands of years medicinal plants have been used to treat health disorders. [1]

Now a day's natural products are an integral part of human health care system because there is popular concern over toxicity and resistance of modern drugs. India is one of the 12 leading biodiversity centres with presence of over 45000 different Plant species. Plants are richest resource of drug of traditionary system of medicine, modern medicines, nutraceutical's, food supplements, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs. The uses of traditional medicinal plants for primary health care have steadily increased worldwide in recent years.

Under investigation we identified Teak Plant (*Tectona grandis)* which is belonging to family Lamiaceae. [15] The whole plant is medicinally important and many repots claim to cure severe diseases according to an Indian traditional system of medicine. The survey reveals that the plant used in treatment of urinary discharge, bronchi disorder, cold and Headache. It is also used as Laxative, sedative, as diuretics, Anti-diabetics.

Tectona grandis Linn commonly known as Teak or Sagwan is one of the most famous timber in the world and is renowned for its dimensional stability. *Tectona* is major exotic species found in the topical region. It is also commonly found in India and South Asian countries. *Tectona grandis* is tropical hardwood tree species placed in the flowering plant belonging into family Lamiaceae was first described by Carl Linnaeus the younger in his 1782 work supplementum plantarum. In 1975 Harold Norman Moldeke published new description of four form of this species in journal phytologia. [7]

Plant has major constituent has various pharmacological activities like antibacterial, antioxidant, antifungal, anti-inflammatory, antipyretic, analgesic antidiuretics and hypoglycemic. The *Tectona grandis* flowers used in bronchitis, biliousness and urinary discharge. Both flowers and seed are used as diuretics the wood have expectorant, anti-inflammatory, anti-bilious, anthelmintic action. The bark is powerful Astringent used in bronchititis. Root is used for anuria and retention of urine, Nut oil used in the treatment of Scabies and other skin disease and also for promoting hair growth. [3] The Ayurvedic Pharmacopoeia of India recommends the heartwood in lipid disorder and also for treating

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2D QSAR Study For 1-Aryloxy-3-(N^4-Piperazinyl) Propan-2-OLS

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ABSTRACT

Last three decades enormous work has been carried out on computational chemistry. The projects given for discovery of New Chemical Entities by these methods and gets a safe, potent drug molecule. However, the commercial output for the pharmaceutical company with these methodologies is negligible. Most of the drugs discovered in medicinal chemistry are accidentally. Thus synthesis of focused compound libraries and their pharmacological screening by efficient methods becomes powerful tool for drug discovery. But some additional points are required to move towards aryloxypropanolamines As 1-Aryloxy-3-(N^4-substituted piperazinyl) propan-2 OLS (aryloxypropanolamines) shows β-adrenergic receptor antagonist activity (β-blockers), these chemical entities are applicable in management of various diseases due to their therapeutic effects. The main clinical indications of β-blockers are in the area of cardiovascular diseases, such as hypertension, angina pectoris, myocardial infarction and cardiac arrhythmias[1-4]. However, some β-blockers readily access the brain because of their lipophilicity and can influence some central nervous system functions. Therefore, Propranolol has been used for the treatment of anxiety syndromes, prophylaxis of migraine headaches, schizophrenia, alcohol withdrawals and tremors[5-8]. Looking at the biological profile of various aryloxypropanolamines (also Enciprazine) molecule, synthesis of various derivatives of Enciprazine having different aryloxy moiety and amine moiety (by taking different N- alkyl/aryl substituted piperazine) was planned to get safe, potent or new activity molecules.

Keywords: QSAR, Principles of QSAR, QSAR models, QSAR model Validation

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RESEARCH ARTICLE

Analytical Method Development and Validation for Sultamicillin Tosylate Dihydrate in Bulk and Pharmaceutical Dosage Forms by RP-HPLC

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Manuscript No: IJPRS/V7/I2/00031, Received On: 30/04/2018, Accepted On: 08/05/2018

ABSTRACT

A simple, specific and accurate reverse phase high performance liquid chromatographic method was developed for the Sultamicillin Tosylate Dihydrate in bulk and pharmaceutical dosage form. In spectrophotometric method the stock and working standard solutions of the drugs were prepared in methanol. Sultamicillin Tosylate Dihydrate has shown maximum absorbance at 225 nm. The RP-HPLC method for Sultamicillin Tosylate Dihydrate was developed using phenomenex C18 column (150 mm × 4.6 mm, 5 µm) as stationary phase and Acetonitrile:Water (45:55) as mobile phase at 1.0ml/min flow rate and the method was validated in accordance with ICH guidelines. Sultamicillin Tosylate Dihydrate has linearity in the conc. range of 10-60µg/ml ($r^2$0.9991) in RP-HPLC method. Sultamicillin Tosylate Dihydrate was eluted at 6.9 min. Results of assay and validation studies were satisfactory. So, the developed analytical method can be successfully applied for the routine analysis of Sultamicillin Tosylate Dihydrate in pharmaceutical dosage forms.

KEYWORDS

Sultamicillin Tosylate Dihydrate, Method Validation, RP-HPLC

INTRODUCTION

Sultamicillin Tosylate Dihydrate, chemically known as (2S,5R)-(3,3-Dimethyl-4,4,7-trioxo-4-thia-1-azobicyclo[3.2.0]hept-2-ylcarbonyl)methyl(2S,5R,6R)-6-[(2R)-2-amino-2-phenylacetylamino]-3,3dimethyl-7-ox0-4-thia-1-azabicyclo[3.2.0]heptanes-2-carboxylatemono-4-tolunesulfonate dihydrate. This is a mutual (joint) prodrug of Ampicillin and Sulbactam compounds attached together with ester connection.

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This mutual prodrug is one of the antibiotics with plenty antimicrobial spectrum for the treatment of childhood pneumonia. The irretrievable β-lactamase inhibitor sulbactam has been combined chemically via ester linkages with ampicillin to form sultamicillin. It was composed of double esters of formaldehyde hydrate in which one of the hydroxyl groups is esterified with ampicillin and sulbactam. It is hydrolyzed quickly in neutral or faintly alkaline conditions, while hydrolyzed; it forms ampicillin and hydroxylmethyl sulbactam or sulbactam and hydroxylmethyl ampicillin by different routes.It is available obtainable in both oral and parenteral preparations for child (pediatric) use. Sultamicillin is also a valuable treatment option for a multiplicity of paediatric infections, bacterial infections in children

Research Article | Published: 25 July 2017

Assessment of Toothpaste Formulations Containing Turmeric and Neem Extract for Prevention of Dental Caries and Periodontal Diseases

Baburao N. Chandakavathe, Deepak K. Deshpande, P. V. Swamy & Shivsharan B. Dhadde

Proceedings of the National Academy of Sciences, India Section B: Biological Sciences **88**, 1523–1529 (2018)

Abstract

In the present work, toothpastes were prepared for preventing dental caries and periodontal diseases. Nine formulations (TN_1 to TN_9) were prepared using neem extract and turmeric powder as active principles. These prepared formulations were evaluated for homogeneity, spreadability, fineness, pH, foaming power, tube extrudability, and stability as per the guidelines of the Bureau of Indian Standards and in-vitro antimicrobial activity. The in-vitro antimicrobial activity studies were performed using standard strains such as *Candida albicans* (ATCC No. 10231), *Streptococcus mutans* (MTCC No. 497) and *Porphyromonas gingivalis* (oral gingival swab). A comparative evaluation of

40

Research Article | Published: 19 January 2017

Embelin Ameliorate Testosterone-Induced Prostatic Hyperplasia in Rats

Marulasiddeshwara Roopesh, S. R. Anand Kumar, Shivsharan B. Dhadde, B. S. Thippeswamy ✉, Veeresh P. Veerapur, S. Badami & N. C. K. Baburao

Proceedings of the National Academy of Sciences, India Section B: Biological Sciences **88**, 1055–1061 (2018)

Abstract

Embelin, is a naturally occurring alkyl substituted hydroxyl benzoquinone and a major constituent from all the parts of *Embelia ribes*. It possesses antitumor, anti-inflammatory, antioxidant, analgesic activities and also has the ability to decrease testosterone levels. The present study was designed to determine the effect of embelin on testosterone-induced benign prostatic hyperplasia (BPH) in rats. Male Wistar rats were randomly divided into six groups and treated with either embelin (5 and 10 mg/kg), finasteride (1 mg/kg) or vehicle. After above mentioned treatment, testosterone (3 mg/kg; subcutaneously) was administration for 28 days, to induce BPH. On the day 29, blood samples were collected from the retro-orbital plexus. After blood sample collection

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Ameliorative effect of chromium-d-phenylalanine complex on indomethacin-induced inflammatory bowel disease in rats

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Affiliations

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Abstract

Present study was designed to evaluate the effect of chromium-d-phenylalanine complex (Cr (d-phe)$_3$) on indomethacin-induced inflammatory bowel disease (IBD) in rats. Adult Wistar rats were pretreated with vehicle/Cr (d-phe)$_3$ (30, 60 and 90μg/kg, p.o.) for 11days. On day 8 and 9, after one h of the above mentioned treatment, indomethacin (7.5mg/kg/day,s.c.) was administered to induce IBD. On day 12, blood samples were collected from animals for lactate dehydrogenase (LDH) estimation and ileum was isolated for macroscopic scoring, biochemical estimation (lipid peroxidation, reduced glutathione and myeloperoxidase activity) and histopathological study. Administration of indomethacin significantly altered the serum LDH, macroscopic and microscopic appearance and biochemical parameters in ileum tissue. Cr (d-phe)$_3$, at all the tested doses, caused a significant reversal of changes induced by indomethacin. Present study demonstrates the protective effect of Cr (d-phe)$_3$ against indomethacin-induced IBD in rats. The observed protective effect might be attributed to the antioxidant and anti-inflammatory properties of Cr (d-phe)$_3$.

Keywords: Anti-inflammatory; Antioxidant; Inflammatory bowel disease; Myeloperoxidase.

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RESEARCH ARTICLE

Development and Validation of Analytical Methods for Simultaneous Estimation of Sitagliptin Phosphate and Pioglitazone Hydrochloride

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ABSTRACT

Simple, rapid, accurate and precise UV spectrophotometric and RP-HPLC methods had been developed for simultaneous estimation of Sitagliptin Phosphate (STG) and Pioglitazone Hydrochloride (PIO). The method applied was Simultaneous Equation Method (Vierodt's Method), based on measurement of absorbance of Sitagliptin Phosphate and Pioglitazone Hydrochloride at λ_{max} 267nm and 270nm respectively. Linearity was found in the concentration range of 50-250µg/ml for Sitagliptin and 5-25µg/ml for Pioglitazone with regression coefficient r^2=09997 and r^2=0.9995 respectively. RP-HPLC method was carried on Phenomenex C-18 column (150 mm × 4.6 mm, 5 µ) by using a mobile phase acetonitrile: methanol: water (30:30:40) as a mobile phase at 1.0 ml/min flow rate at 270 nm. The linearity was found to be in the range of 10-50 µg/ml and 3-15µg/ml with regression coefficient of r^2= 0.9998, and r^2=0.9996 for Sitagliptin Phosphate and Pioglitazone HCl respectively. The peak obtained were sharp having clear baseline separation with a retention time 5.6 and 2.8 min for Sitagliptin Phosphate and Pioglitazone HCl. This method is accurate and precise and can be employed for routine analysis of Sitagliptin Phosphate and Pioglitazone hydrochloride in different pharmaceutical dosage forms.

KEYWORDS

Sitagliptin Phosphate, Pioglitazone HCl, UV- spectrophotometry, RP-HPLC

INTRODUCTION

[1]Sitagliptin Phosphate and Pioglitazone Hydrochloride are antidiabetic drugs. Sitagliptin belongs to the class of Dipeptidyl peptidase-4[DPP-4] inhibitors, a new class of anti-diabetic drugs which act by increasing glucose dependent insulin release. Therapeutically DPP-4 inhibitors are used to treat type 2 diabetes alone or combination with other drugs which increases the sensitivity of

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RESEARCH ARTICLE

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ABSTRACT

Simple, rapid, accurate and precise UV spectrophotometric and RP-HPLC methods had been developed for simultaneous estimation of Sitagliptin Phosphate (STG) and Pioglitazone Hydrochloride (PIO). The method applied was Simultaneous Equation Method (Vierodt's Method), based on measurement of absorbance of Sitagliptin Phosphate and Pioglitazone Hydrochloride at λ_{max} 267nm and 270nm respectively. Linearity was found in the concentration range of 50-250µg/ml for Sitagliptin and 5-25µg/ml for Pioglitazone with regression coefficient r^2=09997 and r^2=0.9995 respectively. RP-HPLC method was carried on Phenomenex C-18 column (150 mm × 4.6 mm, 5 µ) by using a mobile phase acetonitrile: methanol: water (30:30:40) as a mobile phase at 1.0 ml/min flow rate at 270 nm. The linearity was found to be in the range of 10-50 µg/ml and 3-15µg/ml with regression coefficient of r^2= 0.9998, and r^2=0.9996 for Sitagliptin Phosphate and Pioglitazone HCl respectively. The peak obtained were sharp having clear baseline separation with a retention time 5.6 and 2.8 min for Sitagliptin Phosphate and Pioglitazone HCl. This method is accurate and precise and can be employed for routine analysis of Sitagliptin Phosphate and Pioglitazone hydrochloride in different pharmaceutical dosage forms.

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PHYTOCHEMICAL EVALUATION OF CRYPTOSTEGIA GRANDIFLORA LINN ROXB. EXTRACT

Nitin Mali 1 *, Akshay Javalgikar 2, Sagar Kale 1

ABSTRACT

Now-a-days natural products are an integral part of human health care system, because there is popular concern over toxicity and resistance of modern drugs. India is one of the 12 leading biodiversity centers with presence of over 45,000 different plant species. As a result of rapid development of phytochemistry and pharmacological testing methods in recent years, new plant drugs are finding their way into medicine as purified phytochemical. There are various simple and cheap methods available for finding out about the various medicinal uses medicinal plants contain many bioactive compounds that can be used in the process of curing various human diseases to identify these compounds one can perform the phytochemical screening of various parts of any specific plant. Phytochemicals is generally used to describe plant compounds that are under research with unestablished effects on health. Cryptostegia grandiflora Linn Roxb. (Apocynaceae), commonly known as "Vilayti vakundi" is found all in dry area in India. The study includes preparation of different extracts by successive solvent extraction for detail analysis. Fluorescence analysis of different successive extract and powder were noted under UV light and normal ordinary light, which signifies there characteristics. Preliminary qualitative chemical test for different extracts showed presence of glycosides, flavonoids, fixed oil and fats, phenolic compounds, protein and amino acids, tannins, gum and mucilage and carbohydrates. Qualitative phytochemical analysis of methanol extracts of leaves of Cryptostegia grandiflora Linn Roxb showed the presence of cardiac and saponins glycosides, tannins, flavonoids, proteins.

KEYWORDS: *Cryptostegia grandiflora Linn Roxb, qualitative analysis, methanolic extract, flavonoids.*

Preview

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Research Article

EVALUATION OF CARDIOPROTECTIVE ACTIVITY OF TERMINALIA CATAPPA LEAVES AGAINST DOXORUBICIN INDUCED MYOCARDIAL INFARCTION IN ALBINO RATS

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Terminalia catappa leaves, Cardiotoxicity, Doxorubicin, Methanolic extract.

ABSTRACT

Objective: The present study was intended to evaluate the cardioprotective activity of (METCL) methanolic extract of Terminalia catappa leaves.

Method: The methanolic extract of Terminalia catappa leaves at the dose of 100, 250 and 500 mg/kg was administered orally to Wistar albino rats with Doxorubicin (2.5mg/kg) induced myocardial infarction. Ascorbic acid (20mg/kg) was given as standard reference drug.

Results: Effect of METCL on serum enzymes and biomarkers

Rats intoxicated with Doxorubicin exhibited significant elevation in the levels of Aspartate amino Transferase (AST), Alkaline Phosphatase (ALP), Creatine kinase (CK), CK-MB and Lactate Dehydrogense(LDH) as compared to normal group. Animals pre-treated with graded doses of (100, 250 and 500 mg/kg) METCL significantly reduced the elevated levels of AST, ALP, CK, CKMB and LDH in a dose dependent manner as compared to Doxorubicin treated group.

Effect of METCL on serum cholesterol and triglycerides

Significant increase in the levels of serum cholesterol and triglycerides monitored in Dox administered group compared to normal control. Dose dependent significant reversal of these two lipids demonstrated in animals pre-treated with METCL compared to Doxorubicin treated group.

Conclusion: The results of the present study conclude that methanolic extract of Terminalia catappa leaves possesses significant cardioprotective activity against Doxorubicin induced cardiotoxicity in albino rats. This observed activity may be due to the presence of flavonoids and tannins in the test extract and may be linked to its antioxidant property.

INTRODUCTION

Myocardial infarction (MI) is the interruption of blood supply to part of the heart, causing heart cells to die, commonly due to occlusion of a coronary artery. It creates a major cause of morbidity and mortality in developing countries due to increased high prevalence of risk factors and also aging of their populations [1]. Causative factors for cardiovascular disease are smoking, hypercholesterolemia, high low density lipoprotein and low high density lipoprotein, diabetes, high blood pressure, older age and obesity. Complications of MI include arrhythmias, congestive heart failure, cardiogenic shock, pericarditis and pulmonary embolism [2].

According to WHO 17.3 million peoples died from cardiovascular diseases, more than 80% of CVD death took place in low and middle income countries [3]. It is estimated that by 2030 more than 23 million peoples in world 2.6 million people in India will die annually from CVDs [4, 5]. Apart from drug therapy and life style modifications, dietary changes and supplementation play an important role in the conservative treatment of CVDs. Current interest has focused on plant based natural drug treatment. *Terminalia catappa* belongs to the family Combretaceae and is popularly known as 'Deshi Badam'. It is a well-known herb in Ayurvedic system of medicine. Juice of young leaves are employed in preparation of ointment for leprosy, scabies and also used internally for colic and headache [6].

T. catappa fruits has been investigated for its effect on fasting sugar level and serum parameters. Various pharmacological studies have reported that the extract of *T. catappa* leaves and fruits have antioxidant, anticancer, anti-HIV reverse transcriptase, anti-inflammatory, antidiabetic effects and hepatoprotective activities [7]. Earlier researchers demonstrated that medicinal plant extract possessing antioxidant activity exhibits cardioprotective efficacy [8]. *T. catappa* leaves also possesses antioxidant activity, in this context, the present research work was undertaken.

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